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## Web Portals in SMEs – Two Case Studies

by Martin Wynn and Shujun Zhang

**Abstract**—This paper examines how two small to medium sized enterprises (SMEs) implemented web portals as part of a new e-business strategy to underpin future corporate expansion. The first company (Unified Office Products Limited) transformed itself from a traditional office supplies company into an intermediary trading over the web with a range of business partners in the office supplies supply chain. In the second case study, a small consultancy and training organisation (C&G Services Europe Ltd) saw the opportunity to develop a web portal to improve its on-line service to key customers, including some of the major utilities companies in the UK. Both these projects were implemented via the Knowledge Transfer Partnership scheme that provides UK Government funding to support university employed project managers working in industry to lead projects of key value to the partner companies. The progress of both companies across the duration of these projects is gauged against two mainstream models of IT and e-business development.

**Index Terms**—Knowledge Transfer Partnerships, process improvement, SMEs, web portals

### I. INTRODUCTION

Innovation is at the heart of government policy for re-invigorating and supporting British industry. Reference [1] concluded that 'a strong technological base is as critical to the prosperous survival of a firm as a good understanding of markets and a strong financial position', and in 2003, the Department of Trade and Industry (DTI) specified a range of products for supporting and promoting innovation, particularly in the field of technology development and application [2]. One of these products is the Knowledge Transfer Partnership (KTP), which provides direct support of circa £25 million per annum for graduates to undertake specific knowledge transfer projects in firms of all sizes, but particularly in small to medium sized enterprises (SMEs) of less than 250 staff [3]. It is the deployment of this scheme to introduce web portal developments in two SMEs that is the focus of this paper.

### II. SMES AND E-BUSINESS

The Commission of the European Communities defines SMEs as enterprises with fewer than 250 employees and a turnover of no more than 40 million euros (£27.6 million) or an annual balance sheet total not exceeding 27 million euros (£18.6 million). The Small Business Service (SBS), an agency of the DTI, reported that there were 4.3 million business enterprises in the UK in 2005, of which nearly all (99.9%) were SMEs [4].

The SME sector produced over 51% (£1.22 billion) of total company turnover, and employed 12.9 million people.

Reference [5] suggests that the use of the Internet by SMEs is underdeveloped, with usage primarily concerned with sending emails, transferring files and gathering information. Reference [6] supports this view, asserting that for many SMEs, the sole objective of their e-business strategy is to have a web presence, and not enough time is devoted to planning and evaluating the potential opportunities that e-business offers. Reference [7] identifies that most SMEs implement e-business technologies without preparing a strategic business case.

It is not surprising, therefore, that many SMEs, particularly those operating in the traditional industry sectors, have been reluctant to invest significantly in e-business technology. This certainly applies to the web portal, commonly referred to as simply a *portal*, which is a web site or service that offers a broad array of resources and services for customers and business partners, such as e-mail, forums, search engines, and on-line shopping malls. The web portal was one of the earliest e-business models referred to in the standard texts [8], there being at least two kinds of web portal: vertical and horizontal. The vertical portal is designed for a particular industry/service sector, such as those portals for automotive or aerospace industry. The horizontal version is for any industrial/service sector. When applied to an individual company, as in this paper, the portal is normally viewed as a 'window' into the host company's systems and information, and will normally allow the customer to track information as well as effect sales transactions. The first web portals were online services, such as America Online (AOL), that provided access to the Web, but by now most of the traditional search engines have transformed themselves into web portals to attract and keep a larger audience. The web portals discussed in this paper are vertical ones for specific service industries.

### III. MODELS OF TECHNOLOGY ADOPTION AND EXPLOITATION

This article reports on the benefits delivered in two companies through the implementation of web portals and analyses company progress against two IS/IT models of technology adoption and deployment – Nolan's model of the use of IT/IS in industry, and the DTI model of e-business adoption. Nolan's model dates from the late 1970's and was initially used to help explain the growth in expenditure as the use of IT/IS spread through an organization [9]. Despite the fact that it dates from a different period in IT/IS history, it is still

regarded by many [10] as useful in providing an evolutionary view of a business's use of IT/IS, and in illustrating that different management approaches are required, depending on the status of IT/IS in a company. The six stages in the evolution of IT/IS in Nolan's model are depicted in Fig. 1 and may be summarized as follows in today's business context:

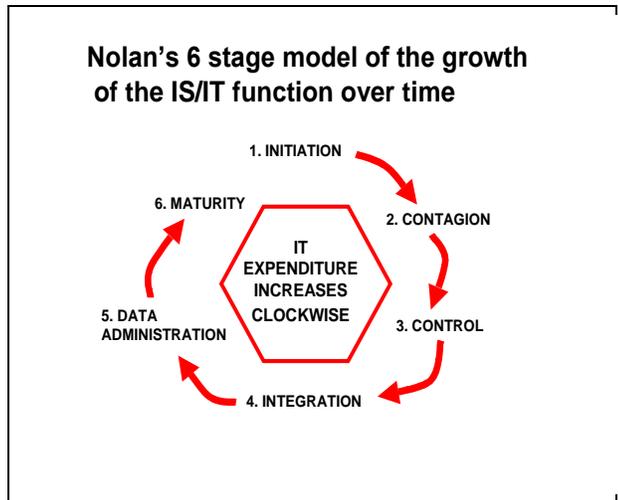


Fig. 1. Nolan's Model of the Evolution of the IT/IS Function  
Source: Reference [9]

**Initiation:** The introduction of systems or technology by end-users (often, originally, the finance department).

**Contagion:** The spread of computing applications into other areas, in a totally uncontrolled manner. Some applications will fail, and the management of IT/IS is chaotic and largely unregulated.

**Control:** Senior management become concerned at the level of expenditure and lack of control. Responsibility for management is moved to a formal IT/IS department, and support responsibilities are centralized. Applications concentrate on saving money rather than making money.

**Integration:** Typically, this is where new significant expenditure is made in new systems in an attempt to gain the benefits of technology integration. IT/IS staff may be reorganized into functional areas to support different parts of the business, and only at this stage is there a real dialogue between IT/IS specialists and systems end-users.

**Data administration:** Developments are driven more by the organization's need for information; data management and maintenance becomes a key issue in the overall management of the IT/IS function.

**Maturity:** Planning and organization of the IT/IS function is fully integrated into the business strategy planning and day-to-day management of the organization. Major applications are 'owned' by end-user management, who also has responsibility for data maintenance, process change and systems upgrade decisions.

The DTI Adoption Ladder (Fig. 2) charts the adoption of e-business technology in companies through 5 sequential stages [11]. This model has been the favored approach by the UK Government's Department of Trade and Industry, and lies at

the heart of the governmental understanding of the adoption of e-business by existing small firms.

It implies that business benefits derive directly from organizational change and increasing sophistication based on e-business technology adoption. Reference [11] suggests that the change is progressive, and greater sophistication derives from the unique qualities of the Internet - ubiquity, interactivity, speed and intelligence. The five stages in the model are:

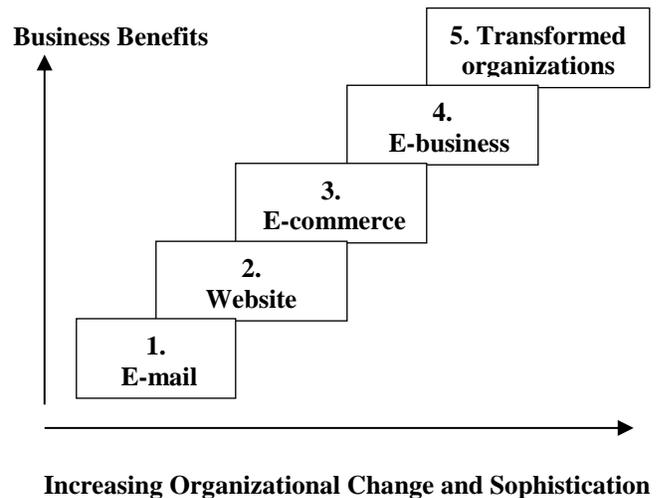


Fig. 2. The DTI E-Business Adoption Ladder  
Source: Reference [11]

**E-mail capability** – efficient internal and external communication.

**Website presence** – a place in the worldwide market, for information and marketing purposes.

**E-commerce** – the company has transaction processing capability on-line, normally order capture, but also encompasses e-procurement.

**E-business** – integration of supply chain so manufacture and delivery become seamless; minimize waste across the supply chain.

**Transformed organization** – open systems information for customers, suppliers and partners engender new business models based on inter-working between organizations and individuals.

To achieve the status of a fully functioning e-business, there are two digital divides that need to be crossed [5]. The first divide involves gaining the necessary skills and technology to use e-mail and simple websites. The second divide is the actual starting point of running a complete e-business, which requires advanced technology and IT skills and a larger range of specialist business skills involving marketing, strategy and management. The model displays the technological transformational aspects of e-business adoption, and the key social processes that emerge from each stage in the adoption, which is seen as a benefit [11]. However, the model implies that SMEs need to follow a prescribed course of e-business adoption, with the suggestion that to not reach the top of the ladder is failure. This paper answers the following questions with regard to the case studies:

- How do these companies fit with Nolan's model of the growth of the IT/IS function, and has there been a significant step forward through the introduction of a web portal?
- At what stage were these companies in the E-business ladder prior to, and post, the KTP change project?
- Do these findings provide any guidance for other SMEs developing e-business strategies and embarking upon web portal developments?

#### IV. CASE STUDY 1: NEW B2B/B2C WEB PORTAL AT UNITED OFFICE PRODUCTS LIMITED

##### A. Background

United Office Products Limited (UOPL) is an office products dealer group providing specialist services, including central purchasing, marketing and IT support to new and existing firms and companies in the office supplies industry on a franchise basis. The overall aim of the KTP project was to design, develop and implement a state-of-art office supplies ordering system to replace the existing one developed over the last ten years. The system, which is now in place, allows the effective management of office suppliers by an independent dealer for a customer employing a minimum of 50 white-collar workers. The system controls product usage and removes the many administrative costs associated with purchasing, accounting and distribution. It thus impacts across the office supplies supply chain, and is aimed at reducing costs and improving service for all partners. Reference [1] has noted the potential impact of such change thus: 'an existing distribution network can suddenly be threatened by a new technology that requires sharply reduced servicing or maintenance'. The main benefits in this case study, however, have been more on the delivery of mutual benefits across the supply chain rather than a threat to entities operating within it.

The company is made up of three dealer groups, Officeteam, OSTALine, and OfficeSMART. Each dealer group has independent office products dealers as members. The group negotiates buying agreements with common suppliers, provides unique marketing, and co-ordinates all back office services including IT support. UOPL's main business objective is to work with the dealer members to improve their business performance and their profitability. This includes developing concepts and programs on behalf of the dealer members, which keeps them up to date with modern business approaches and hence keeps them ahead of their multi-national competitors.

##### B. The Project

The old Office Supply Order System (OSOS) was error-prone and time consuming to use. The KTP programme enabled the company to develop a state of the art web-based integrated portal for Office Supply and Ordering, replacing the old OSOS technology. The development involved Officeteam and the

Officeteam dealers in particular and supported UOPL's unique approach to selling office products. The main objectives of the project were:

- To analyze the OSOS technology deployed at the time.
- To analyze and optimize the business model of UOPL to exploit to the full opportunities offered for e-business based around the new United Office Supplies System (UNISOS) technology platform. *Achieved – this defined clear requirements for a web-based solution that enabled a working model to be produced which was commercially acceptable to the group, the dealers in the group, and the clients who subsequently adopted the system*
- To analysis and model different data used in the office supply ordering process. *Achieved. Understanding and defining the requirements were essential for all parties. Common data definitions are essential for an e-business system involving B2B and B2C transactions and information exchange*
- To design and develop a new database-independent UNISOS that supports a wide range of servers and operating systems. *Achieved, the final systems were mainly web based, deployed Windows technology and used industry standard SQL to provide connectivity for the dealer and the client resulting in a commercially acceptable product.*

The old OSOS system was paper based and time consuming to operate and maintain. The dealers had lost confidence in the product and were making no effort to win new business. Accounts already operating on the old system were being transferred to other competitive alternatives. Revenue for UOPL was on the decline and the company had moved with this particular product from profit to loss. The company operates in a very competitive market where product price is perceived as the key to winning new business.

##### C. The Outcome

The new systems (Fig. 3) are an integration of UNISOS web and UNISOS windows and significantly improve the company's ability to win profitable business by providing a key point of differentiation with its clients and reducing clients' costs. The company can use the new web-based UNISOS system to integrate business activities of office stationery, customers and dealers, with a central database. This leading edge e-business tool provides the company with a strong competitive platform to retain existing business and gain more business in the office product supply industry.

A further hard benefit has been the redeployment of two full-time staff that were dedicated to tedious and error-prone manual input work, made necessary by flaws in the old system. In addition, the company is now able to provide an on-line facility to customers and dealers giving them access to daily business performance reports with standard templates and their own preference styles.

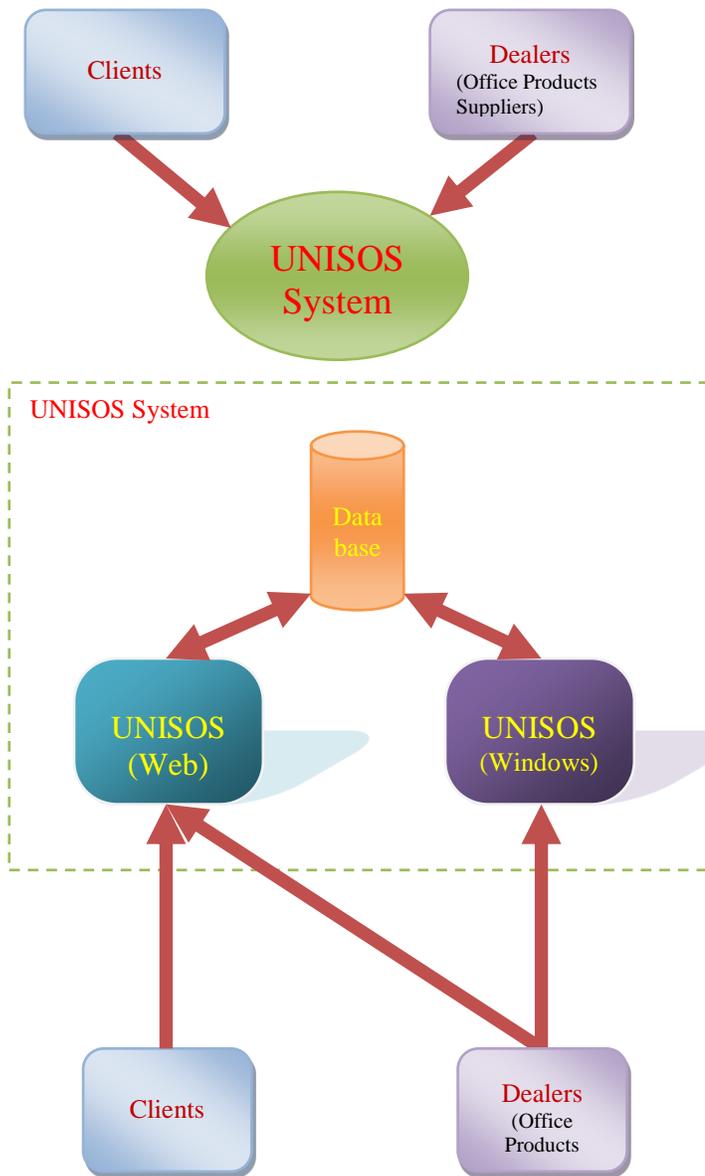


Fig. 3. UNISOS Systems Diagram

The new systems were launched in 2006, and turnover has increased significantly since then. Investment in new technology by the company for the new systems totaled circa £40K, and staffing levels increased from 27 in 2003 to 34 in 2007. In addition, the application of this system has had a significant impact on dealers' business performance, service quality, efficiency and turnover. For the University of Gloucestershire, this project helped strengthen its position and reputation in the areas of e-business system analysis, modeling, design, development and management.

## V. CASE STUDY 2: WEB-ENABLED CRM AT C&G SERVICES (EUROPE) LTD

### A. Background

C&G Services (Europe) Ltd specialize in the provision of

skills training to industries and utilities in the UK and the provision of Health & Safety consultancy services. The company generates revenue from a number of vertical markets, but in particular these are utilities (customers include Severn Trent Water and Thames Water), plant manufacturers and machinery manufacturers. In addition, through its wholly owned subsidiary, C&G Safety & Environment Ltd, the company delivers health and safety consultancy to a range of industries. The company has several valuable contracts including two with major utility companies (Severn Trent Water and Thames Water). C & G Services (Europe) Limited had a turnover of £1.4m in 2004/5 (at the start of the project) in a national market of many £billion turnover per annum.

The company had enjoyed steady growth for some years. However, to continue this growth it became clear that business processes needed to become smarter and more efficient. The company suffered from extremely detailed procedures that were put in place because of the possibility of liability charges arising from the need to deliver the right knowledge to the right people using potentially dangerous equipment or to impart correct advice in any given situation. The old processes were lengthy and it was believed that more modern systems would avoid the need for further administrative personnel. The company was at risk of being 'top heavy' in its ratio of administrators to trainers.

The old computer systems had evolved over a period of years as the company expanded and took on new services and new staff. The level of IT expertise within the company was insufficient to develop systems that the largest clients are now requiring. In addition, the company lacked any real experience of business process remodeling and rationalization that precedes the development of new e-business systems.

### B. The Project

The KTP project plan was based on the remodelling of business processes and the implementation of new information systems and technologies (Fig 4). This was done through a number of project stages as follows:

- Research of the current technologies and business processes in the company.
- Process re-engineering across the company focussing on speeding administration and enhancing customer service
- Specification of functional requirements and a new technical architecture for new systems and a web portal to push these systems out on to the Internet.
- Selection, procurement and implementation of the Course Booker package for in-house information processing and reporting. This was selected after a review of available software on the market.
- Implementation of a web-based portal for customer information and services

### C. The Outcome

This new system went live and fully operational in 2007, including 5 years worth of essential business data imported from the previous software package. The initial phase focused on a new course booking and administration function contained in the Course Booker package, and this is now being made

available to key customers via the portal function built into the software package. Specific project outputs include:

- New in-house systems to support new business processes.
- Improved information availability for both in-house staff (for example between booking co-ordinators and instructors out in the field) and for key customers.
- A web-based portal for customer information and services.

Faster information processing and better access to key data for clients and staff allows more time for proactive work with current clients and prospective clients. Greater information visibility now gives the company more ‘control’ over workload with easier knowledge of existing client refresher-training schedules and associated new requirements allowing more efficient and effective management and allocation of company staff.

This is seen by clients in terms of improved and more proactive support facilities and in turn brings more business, with circa 80% of business coming from 20% of the client base. The company is well aware that there is much ‘untapped’ business to be won from the larger organizations it currently deals with. It is expected that the company will increase its turnover by 20% per annum for the next two years, increasing that percentage thereafter as opportunities develop while at the same time holding back increases in administration costs. The expected net effect is that turnover will double from £1.4m in 2004/5 to £2.8m in 2009/10, and that profit margins will increase from the current level of 13% to circa 20% by 2009/10. Bottom-line benefits come from an estimated reduction in paper and storage of £15K per annum and headcount avoidance (as the company expands) of circa 4 heads across the company.

The embedding of a new information culture within the company has highlighted the importance of information in the internal functioning of the company and at the customer interface through the web portal. This has required training and new skill-sets for the company’s own staff, and is producing a highly computer literate, customer aware workforce. Investment in new systems and technologies has totaled in excess of £50K as a one-off investment to secure the project benefits.

## VI. RESEARCH FINDINGS

The case studies described above illustrate how web portal developments can progress a company’s management of its IT/IS and its exploitation of e-business. There is strong evidence that both companies have moved forward significantly, with regard to the models of Nolan and DTI, as web portals and new support systems have been implemented.

### A. UOPL

Prior to the web portal project, UOPL had a website for promotional and information purposes, but did not use its site for order capture. The introduction of a web based office supplies ordering system to replace the old in-house legacy system not only allowed order capture via the web but also

controls product usage and removes the many administrative costs associated with purchasing, accounting and distribution. It has transformed the office supplies supply chain, and reduced costs and improved service for the company and its business partners. As such it has moved the company towards the ‘transformed organization’ status in the DTI model. As regards Nolan’s model, UOPL started the project at the ‘control’ stage, with a range of legacy systems that were disparate and non-integrated, but that were at least supported by an IT function. By the end of the project, the company had achieved ‘integration’ of its core customer facing systems via the new information portal, and had made significant progress towards ‘data administration’ in its sales facing systems.

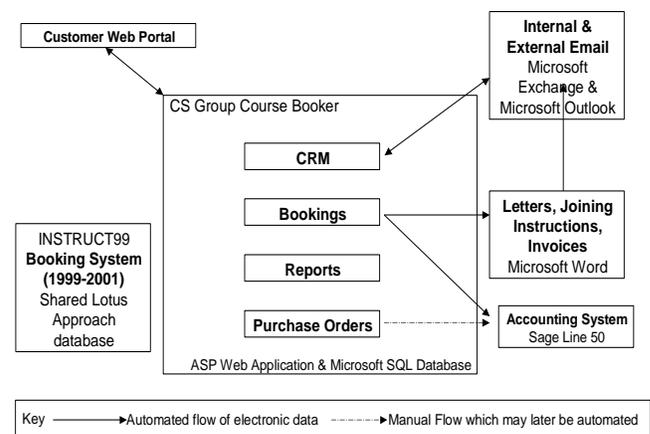


Fig. 4. New Systems at C&G Services (Europe)

### B. C&G Services

At C&G Services, the web portal project is part of an initiative to kick-start a radical step change in the company’s management of information in its customer facing processes, and is also significantly speeding in-house administration. As regards the DTI model, the company is attempting to advance from the simple ‘website’ stage to a ‘transformed organization’, in which key information is readily available to customers via a state of the art portal. The company is thus attempting the jump across the ‘second digital divide’ [5] that will allow it to function as a full e-business. At the same time, the company is attempting a major rationalization of data and integration of main business systems. Reference [12] notes ‘the challenge is to integrate the whole set of enterprise wide applications into a single integrated information network’. This is a key objective at C&G Services, and as such the company is moving from a situation where it was struggling to control its systems and data (‘contagion’ in Nolan’s model) towards a fully integrated platform (‘integration’).

Reference [1] notes that ‘incremental innovation is clearly of critical economic and competitive importance, especially when investment in radical innovation is difficult to justify’. In this context, these portal projects can be viewed as catalysts for

a step change in the companies' exploitation of information technology in support of their main business goals.

## VII. CONCLUSION

As regards correlation between the two models, the case studies suggest that to move forward effectively with e-business, the IT/IS function of an SME must at least be at the 'Control' stage in Nolan's model, and preferably moving rapidly towards 'Integration'. If internal systems are not integrated and if they contain multiple versions of key data items (notably customer and product data), then attempts to build effective customer portals and web-based CRM systems are problematic and likely to fail. UOPL showed the importance of sorting internal systems and data out first, and this challenge now confronts C&G Services. In both companies, these projects have been key enablers in bringing about significant advancement in the deployment of technological developments.

The definition of e-business has now been widened by many commentators to include 'all aspects of the use of information technology in business' [13], and it is perhaps in this context that web portal developments (from both a business and a technology perspective) should now be viewed. This resonates with Michael Porter's view that 'in our quest to see how the Internet is different, we have failed to see how the Internet is the same... the next stage of the Internet's evolution will involve a shift in thinking from e-business to business, from e-strategy to strategy' [14]. Just as e-business is subsumed into normal business, so e-business technologies are converging with other technologies and becoming one component of the company IT/IS portfolio. SMEs can now view e-business as a process or function of the business which, like all other parts, requires, and benefits from, technology support. The case studies in this article illustrate the benefits that such projects can deliver – even to SMEs operating in well-established industry sectors.

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