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A participatory action research study of knowledge management implementation in a large European telecommunication company in their UK office

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Abstract

Knowledge management is being highlighted as a major source of sustained competitive advantage for contemporary organisations. Deploying knowledge management programs presents many challenges and this is evident by the high failure rate of initiatives. Conventional research techniques have failed to develop a rich understanding of the major implementation barriers and have therefore provided minimal assistance to practicing managers. This paper discusses the importance of knowledge to customer support organisations in the telecommunications sector and how one European support organisation approached the deployment of knowledge-centric support in their UK office. The deployment approach incorporates a participatory action research framework that facilitates research and project delivery and ensures practising managers have learning outcomes that can be applied in their organisations.

Keywords: Telecommunications Industry, Knowledge Management, Action Research, Customer Support Barrier

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Introduction

Organisations are under pressure to adapt to factors such as globalisation, higher degrees of complexity, changing economic and political structures. These transformations require organisations to continually learn and create value from their knowledge assets. Drucker (1993) argues that knowledge is not just another resource alongside the traditional factors of production, labour, capital, and land – but the only meaningful resource today. Davenport and Prusak (1998) echo Drucker's sentiments, proclaiming that with discontinuous change in global economies, innovation through continual learning is the key to competitiveness.

Management scholars today consider knowledge and the ability to create and utilize knowledge to be the most important source of a firm's sustainable competitive advantage (Greiner et al. 2007, Davenport and Prusak, 1998; Drucker, 1993; Nonaka and Takeuchi, 1995; Teece, 1998). However, attempts to manage knowledge have failed to deliver the prescribed benefits (Riege 2005, Chase, 1997; Lucier and Torsiliera, 1997; Malhotra, 2004; Storey and Barnett, 2000). Once the initial pageantry of the knowledge management strategy dissipates, practitioners face enormous barriers implementing and sustaining the project. Therefore, a high percentage of initiatives are cut back after two to three years (Storey and Barnett, 2000).

This paper outlines a participatory action research project that investigates the barriers to deploying a knowledge management strategy in a European customer support organisation in their UK office. From a richer understanding of these barriers, practitioners will be able to improve the success rate of knowledge management projects.

Customer support in the telecommunications industry

The telecommunications industry has undergone considerable advancement since Alexander Graham Bell invented the telephone in 1877. The telecommunications market has evolved

from the early 1920s, where governments of developed nations created monopolistic market structures to deliver a universal telephone service to the highly liberalised market of today. The advancement has been driven by increasing demands and sophistication of consumers, technology advancement, harmonisation of technical standards, and globalisation. Therefore, deregulation and privatisation has created a competitive marketplace where end-user services spending in Europe is predicted to be $281 billion (US) by 2008 (IDC, 2004). Deregulation of the market has led to a proliferation of new products and services where the sector now covers:

- traditional telephone lines
- broadband services
- managed data services
- mobile services.

The increasing pace of change in the telecommunications market is indicative of the accepted view that for society at large, the magnitude, speed, unpredictability and impact of change are greater than ever before (Burnes, 2004). An environment of discontinuous change generates enormous pressure on organisations to be innovative and continually refresh their knowledge to meet ever-changing market demands.

This change also generates increasing pressure on customer support organisations in the telecommunications sector. Customer support performance is a determinant of customer satisfaction and repeat business for vendors (Kumar 2010, Maggie, Tam and Tummala, 2001). The proliferation of new products and services creates cost pressure owing to increased infrastructure requirements, on-going training and development needs, customer demands, and a highly competitive marketplace. The increasing cost pressure on support organisations demands a new support delivery paradigm where the effective generation and reuse of knowledge takes centre stage.

Customer support knowledge

Customer support organisations have always been involved in the management of data and information (Davenport and Klahr, 1998). However, managing data and information is not enough, because customer support knowledge is unique, owing to the diversity of sources, media varieties and application contexts. The customer support environment incorporates knowledge about customers, products, software application, problems and resolution, problem escalation, call centre management and subject matter experts. Customer support knowledge also incorporates products and services associated with competitors and channel partners. As customers integrate various suppliers' equipment for their technology solution, the services capability of the support organisation becomes a source of competitive advantage.

A key element of support knowledge is timeliness. Customers with network problems require an answer to their problem immediately; they do not want to wait while the support analyst spends time searching various documents and databases for a solution. The just-in-time nature of support knowledge requires structured solutions to known problems, and content management strategies that provide relevant and usable information.

In brief, the competitive marketplace, shortening lifecycle of technology products, and spiralling costs associated with customer support demand that knowledge becomes a valued asset that is proactively managed.

Knowledge management and customer support

The growth and prominence of the knowledge management field has enabled support organisations to understand their greatest value is created from the ability to generate, capture and reuse knowledge (CFSI, 2004). The development or adoption of a knowledge management (KM) strategy for support organisations is a complex task that is compounded

by the ever-increasing number of definitions and debate over what knowledge management incorporates. Quintas, Lefrere and Jones (1997) researched 100 web sites relating to knowledge management that revealed a heterogeneous range of interests, perspectives and issues relating to: economics, intellectual capital, engineering approaches, organisational studies informed by anthropology; epistemology (including cognitive psychology) and classification and definition informed by artificial intelligence and human resources. McAdam and McCreedy (1999) in their review of knowledge management models, highlighted the theoretical nature of knowledge, the role IT plays, the learning aspects of individuals and organisations and the multidisciplinary nature of KM (psychology, management science, sociology, strategy and production engineering).

In an attempt to reduce the disparate sources, Binney (2001) developed the KM spectrum from a review of the literature that covers six elements: transactional, analytical, asset management, process, developmental, innovation and creation. Wiig (1997) proposes five strategies: Knowledge strategy as business strategy, intellectual asset management strategy, personal knowledge asset responsibility, knowledge creation strategy, and knowledge transfer strategy. Hansen, Nohria and Tierney (1999) propose a strategy based on codifying knowledge for reuse or generating knowledge through social interaction.

An important element in the customer support organisation is understanding that support knowledge can be categorised as two types: explicit and tacit (Mutch 2008, Jasimuddin 2012, Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995; Wiig, 2004). Explicit knowledge can be expressed in numbers and words and shared formally and systematically in the form of data, specifications, manuals, and the like (Mutch 2008, Becerra-Fernandez and Sabherwal, 2001). In general, explicit knowledge can be easily captured, codified and reused by other members of the organisation (e.g. customer product documentation.). Tacit knowledge is highly personal, hard to formalise and includes subjective insight, intuitions and hunches (Mutch 2008, Nonaka and Takeuchi, 1995). Moreover, tacit knowledge is highly contextual: it is deeply rooted in action, procedures, routines, commitment, ideals,

values and emotions. Polanyi (1966) articulates that tacit knowledge indwells in a comprehensive cognisance of the mind and body where we can know more than we tell (e.g. experiential problem solving knowledge). Customer support organisations need to understand the importance of the knowledge in the heads of the employees (tacit) and the knowledge that can be easily codified and stored for retrieval (explicit). The knowledge strategy needs to leverage the two types of knowledge for maximum value.

Owing to the unique nature of the customer support organisation, the knowledge strategy needs to be consistent with the workplace context. A common theme in the literature is that the knowledge strategy should be congruent with the organisation's culture, structure and business focus (Jashpara 2011, Jasimuddin 2012, Davenport and Prusak, 1998; Martensson, 2000; McDermott and O'Dell, 2001). Shankar, Singh, Gupta and Narain (2003) posit that engineering firms have six value propositions when developing strategies associated with KM: product and service leadership, operational excellence, supplier relationship, customer intimacy, employee capability and concern for the environment. Customer support organisations are customer facing and cost sensitive, therefore, operational efficiency, customer intimacy and employee capability are all relevant factors.

Knowledge strategy for customer support

In 2002 a European customer support organisation (SupportCo) undertook research in the field of knowledge management to determine an appropriate strategy. The strategy was premised on Malhotra's (1998, p.59) definition of knowledge management: 'Knowledge management caters to the critical issues of organisational adaptation, survival, and competence in face of increasingly discontinuous environmental change; adding that managing knowledge embodies processes that seek to combine the data and information processing capacity of information technologies, with the creative and innovative capacity of human beings'. SupportCo is under enormous pressure owing to rising costs, increased complexity of products and services combined with a competitive marketplace. The ability of

the organisation to adapt to the environment and integrate technology with people is important to their solution.

SupportCo decided to implement the 'knowledge-centred support' strategy, which would enable the organisation to leverage thousands of customer transactions to develop solutions that provided a self-service functionality for customers and employees (CFSI, 2004). The knowledge-centred support strategy was to ensure that the knowledge management solution was consistent with current business systems and would allow problems to be solved faster, optimise resource usage, enable e-services strategy and build an organisational learning culture. Moreover, the specific outcomes were expected to be (CFSI, 2004; Davenport and Klahr, 1998):

- improved quality of solutions to customers
- consistent provision of solutions
- increasing first-call resolution
- reducing cost per call
- reducing calls to support desk
- accelerated training
- increasing employee satisfaction.

Figure 1 outlines the knowledge-centred support model.

Knowledge-centred support practices and processes involve the creation, use and evolution of knowledge. The knowledge is created as a core component of the problem solving workflow and becomes a key asset of the organisation. The 'solution content' is evolved through appropriate leadership, measurement and maintenance workflows. This dual process ensures effective creation, reuse and evolution of solution content.

Figure 1 **Knowledge-centred support model**

KCS Processes
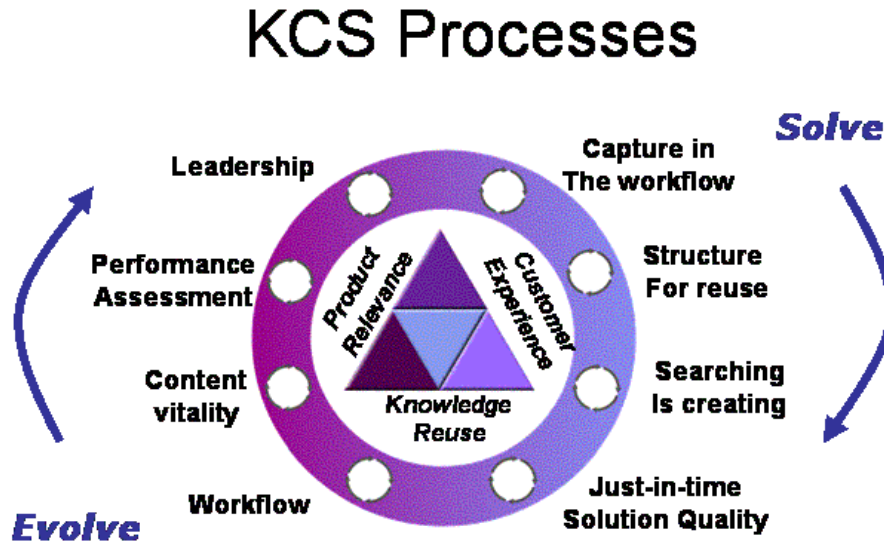
Source: (CFSI, 2004)

Research framework

As discussed earlier, the literature provides a challenging picture of deploying knowledge management as most initiatives failed to have any real impact on the organisation, which forced them to reduce the scope of the deployment after two to three years (Lucier and Torsiliera, 1997; Storey and Barnett, 2000). Moreover, SupportCo had its own experience of failure when deploying knowledge management initiatives. Therefore, SupportCo was determined not to repeat history and wanted to understand the major barriers to deployment; the barriers highlighted in the literature and those that emerged from the research.

The literature cites many barriers that organisations faced when deploying knowledge management programs (Ardichvili, Page and Wentling, 2003; Carrillo et al., 2004; Chase,

1997; De Long and Fahey, 2000; Fahey and Prusak, 1998; Jones, 2001; Malhotra, 2004; McDermott and O'Dell, 2001; Miles et al., 1998; Zyngier, 2001):

- lack of time
- organisational culture
- organisational structure
- leadership and management buy-in
- ambiguous vision – value proposition
- job security
- trust
- knowledge is power
- low tolerance of failure
- reward and recognition structure
- economic focus.

SupportCo understood the importance of customer support knowledge and wanted to ensure that the barriers to deploying knowledge-centric support were fully understood; were resolved in a timely fashion; and would provide a greater opportunity for success.

Participatory action research

To resolve the barriers to deployment as they were identified, SupportCo required the implementation to be based upon change and understanding (Dick, 2001). Therefore, action research was considered an appropriate methodology.

Action research has similarities to action learning, however, action research is more deliberate, systematic, critical, emancipatory, rigorous and documented in a publication (Perry and Zuber-Skerritt, 1992)**.** Action learning emphasizes "*learning by doing* and *learning as a collaborative and social process"* (Er, Pollack and Sankaran 2013: 181). The type of learning created by action research represents enhanced understanding of a complex, social-organisational problem (Baskerville, 1999). Action research can be described as a natural way of acting and researching. It is a family of processes which allow the dual pursuit of action or change, and research or understanding (Dick, 2001). Rapoport (1970) posits that action research aims to contribute both to the practical concerns of people in an immediate

problematic situation and to further the goals of social science simultaneously. Thus, there is a dual commitment in action research to study a system, and for concurrent collaboration with members of the system in changing it, in what is jointly regarded as a desirable direction. Essentially, the methodology is used by a group of people who work together to improve their work processes through integrating action and reflection in a cyclical fashion.

To increase the likelihood of success of the knowledge management deployment, SupportCo selected participatory action research (PAR) as the deployment methodology within the action research framework. PAR is more emancipatory than much action research undertaken (Dickens & Watkins 1999; McTaggart 1991). The PAR approach would ensure that the project team would be emancipated from historical mental models of failure. Moreover, from the literature reviewed, evidence of using a PAR approach to investigating KM barriers was not found.

PAR incorporates all the characteristics of action research, however, it realigns the roles of researcher and subject into a more collaborative and synergistic form (Baskerville, 1999). Moreover, PAR involves inquiry where researchers and the researched population form collaborative relations in order to identify and address mutually conceived issues or problems through cycles of action and research (Parkes and Panelli, 2001). The distinguishing characteristics of PAR are the degree of researcher-participant, mutual learning, degree of participant influence over the research process, and the emphasis on action relative to research and theory building (Israel, Schurman and Hugentobler, 1992). Furthermore, the synthesis of the action researcher's systems knowledge with the client's (problem owner) social context knowledge enhances diffusion of new ideas, change in individual behaviour, organisational practices and richer understanding of the research problem.

The deployment approach proposed for SupportCo is based on the two-project structure of Perry and Zuber-Skerritt (1992) incorporating knowledge champions from each Country acting as a co-learning team. Figure 2 outlines the approach

The deployment was carried out as two action research projects, the 'thesis project' that incorporates a doctor of business administration (DBA) thesis and the 'core action research project' involving the deployment of the knowledge-centric support initiative in the customer support organisation (Perry and Zuber-Skerritt, 1992). The *thesis* project would provide a rich understanding of the barriers to deployment and include the reflections from the *core* project that provide the foundation for completing a doctor in business administration degree. The core action research project is the implementation of the knowledge-centred support program consisting of a co-learning team working through the plan, act, observe and reflect cycle (Perry and Zuber-Skerritt, 1992).

The core action research project incorporates three phases. The first phase is a pilot in the United Kingdom to develop a foundational understanding of the requirements for a successful deployment. The second phase covers Germany, Netherlands, Ireland, Poland and France. The third phase incorporates Spain, Portugal, Russia and Italy.
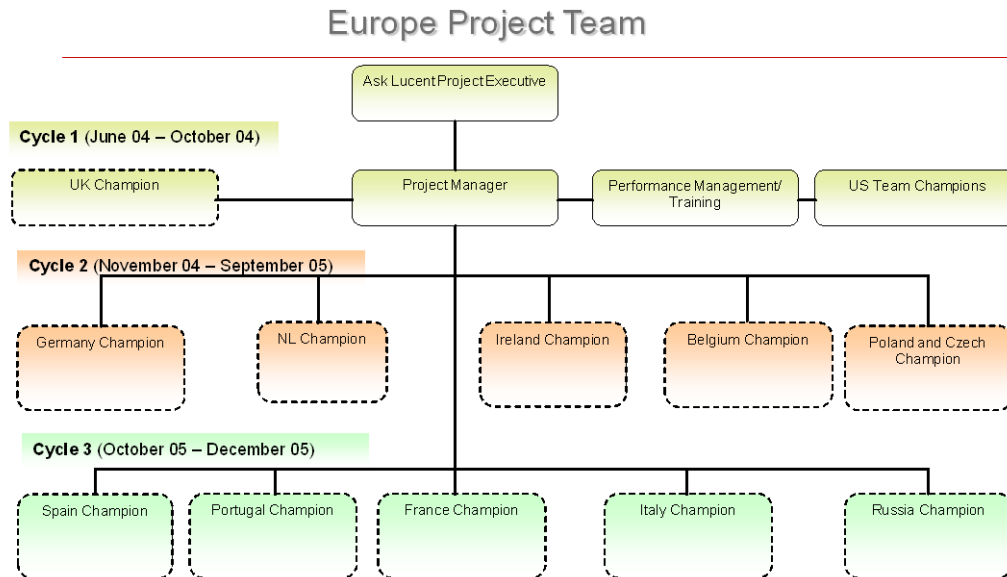
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Figure 2 **PAR Framework**
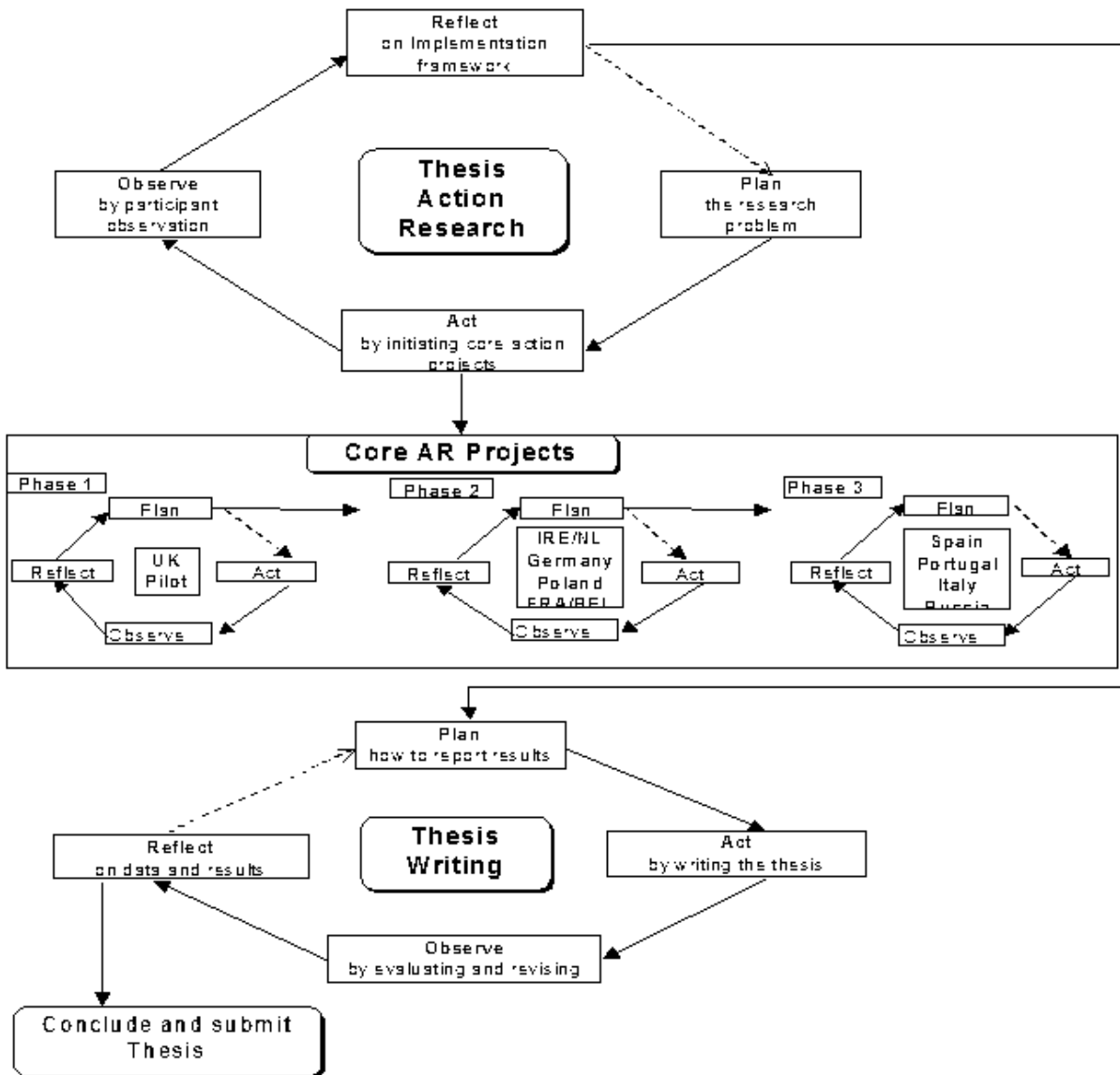
Source: adapted from Perry and Zuber-Skerritt (1992)

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Deployment Model – Core Action research project Cycle 1 (AS initiative)

A knowledge champion for each country was recruited to act as a co-researcher because the deployment was to be highly participative to overcome mental models of historical failure. Moreover, two representatives from the project management office in the United States were supporting the deployment to ensure consistency in process delivery throughout the region.

Figure 3 outlines the action research cycles, countries within each cycle and initial timeframes including champions.

Figure 3 **Project Team**

Source: Walker (2007)

The preparatory work for the action research cycles began in May 2004 and included:

- recruiting champions for the 11 European Countries and distributing their job specifications;
- distributing the project management body of knowledge (PMBoK) outlining the project management methodology of the project management institute to champions who had been nominated;
- developing an Intranet site to communicate European project and operational performance;
- creating a European action register to track issues; and
- setting up a biweekly European call to discuss and track issues in the action register.

The action research cycles were as follows:

- **Cycle 1 Pilot United Kingdom** (June 2004 – October 2004)
- **Cycle 2 Belgium, Netherlands, Poland, Czech Republic, Ireland, German**y, **France** (November 2004 – September 2005)
- **Cycle 3 Spain, Russia, Italy, Portugal,** (October 2005 – December 2005)

Figure 4 provides the context with respect to the organisation within Europe where the knowledge management program was being deployed, and shows the relationship between the European delivery organisation and state based technical support teams.

The central teams provided support services for the European region, and were located in various countries throughout Europe. Therefore an in-country team supporting the customers of that country, and a central team supporting all customers for a particular product in that region, could be co-located. The central teams provided support for various products and were the higher skilled employees.

Action research Cycle 1 United Kingdom Pilot

Although I had started the deployment of the AS initiative before the PAR framework was agreed with SupportCo, I decided that we would use this cycle as a learning opportunity from which we would develop all the project documentation required for Cycles 2 and 3.

Figure 4 **European Support Organisation (SupportCo)**
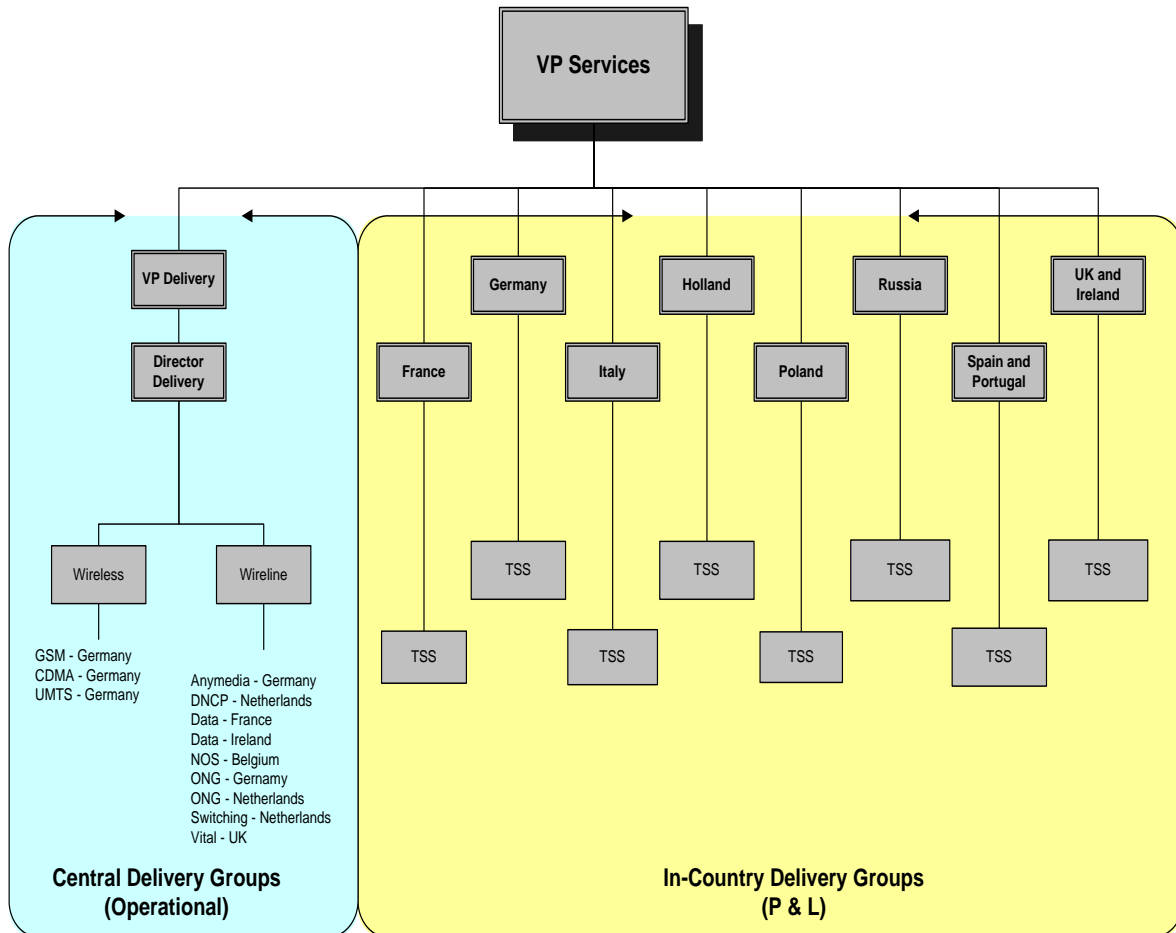
Source: Walker (2007)

Plan

The plan was to use our experiential learning during Cycle 1 to develop all the project documentation required for the AS initiative leveraging PMBoK. I agreed with SupportCo management that we would not develop all nine knowledge areas of PMBoK as existing practices which covered the following would suffice:

- cost management - managed within the current cost tracking system
- quality management – incorporating existing TL9000 processes and content quality requirements

- procurement management – technology had been procured, was in place and operational, and there would be no external consultants involved
- human resource management – I would be responsible for all the training requirements of the AS initiative, although line managers would be responsible for all other HRM activities.

Therefore, we would focus on developing scope, time, risk, communication, and integration management.

I believed that detailed planning would support a successful deployment of the program because little information was available from historical deployments of the AS initiative. Moreover, the deployment of the AS initiative in the United Kingdom would provide us with our first view of barriers to success. The co-researcher team, consisting of Carsten Carbonnier, Dave Wardell, and Hartmut Romig would perform an after-action review after Cycle 1 to solidify our learning.

Act

AS initiative planning activities

To ensure all AS champions were conversant with the action research methodology, I distributed the action research model which outlined the critical reflection element of being a co-researcher. I also added the action research framework to the project definition report (PDR) to ensure all future champions fully understood the relationship between the AS deployment and research activity.

I began planning our first workshop for 7 July 2004 to start the development of the project definition report, as we were beginning to gain a reasonable understanding of the AS program requirements. The workshop had to be conducted via a conference call and online tools owing to budgetary constraints because participants were in the United States, Germany and the United Kingdom. I facilitated the workshop and found the activity difficult to manage

over a conference call as participants became easily distracted by e-mail and instant messaging tools, and they lacked a fundamental knowledge of project management techniques combined with their low level of enthusiasm for planning activities. The purpose of the call was to:

- Define the purpose of the AS initiative.
- Define the work of the project.
- Define the outputs.
- Define the scope of the deployment.
- Develop the work breakdown structure.
- Finalise the high-level draft of the project plan.

The next step in our planning incorporated the development of a project plan detailing the activities required to deploy the AS initiative successfully. I facilitated the workshop by conference call on 22 July 2004 and we successfully created a first draft of a project plan. And on 18 August I facilitated the communication planning session with the co-researchers to continue our work on the PMBoK knowledge areas, and we created an outline of a communication plan. The communication plan incorporated defining the stakeholders, communicating project status and operational performance.

The deployment in the United Kingdom included the implementation of the AS program in two teams with a total of 60 employees. An action register was set up to track the issues and I selected the United Kingdom as the pilot as it was the country I resided in, which provided the ability to interact face-to-face with the teams. Deployment progress was slow owing to my dual roles.

I presented the AS initiative to the management team on 28 June 2004 to refocus their attention and ensure their on-going commitment to the AS program deployment and explain our 'new' approach. On 30 June senior management were asking for demonstrable success with the AS initiative defined in tangible financial results. I began searching for the information required and realised it was only available in the operational data and it would be difficult and time-consuming to develop into a suitable report. A further complication was

that the data was spread across multiple technologies, and customised scripts had been used to 'pull' the data into a central repository that allowed for processing the data into a suitable format. It was not until 8 October 2004 that I was able to commission a software engineer to develop a 'dashboard' that provided visibility of all the operational indicators of the program. I evolved the dashboard to a 'balanced scorecard' (Kaplan & Norton 1992) framework to provide indicators on:

- customer activity
- trouble ticket productivity
- AS operational indicators
- financial value.

This balanced scorecard approach was consistent with SupportCo's measurement philosophy and therefore acceptable, and provided a mechanism to demonstrate value outside the normal financial indicators.

The challenges began to increase as the coaches, who performed the content review task in addition to their 'day job', found it difficult to find the time to perform the review of content. In addition, the support analysts complained about the additional time required to develop content for the knowledgebase. It was evident that the AS initiative was seen as a peripheral activity to the core job of fixing customer problems. Moreover, I discovered that SupportCo had not updated the problem resolution process document to include the knowledge-centric process flow and therefore it was not a component of the quality system. SupportCo was TL9000 accredited and required all documentation to represent how work was performed. Therefore a document was created to outline the fault resolution process in SupportCo, which demonstrated the legitimate process. I had the quality documentation updated to include the knowledge-centric approach and ensured the process activities were embedded into the standard support process to legitimise the AS program.


SupportCo had always been a metric-focussed company and I was spending an inordinate amount of time explaining the metrics as the United Kingdom team wanted to understand how to achieve the metrics rather than engage in the value or philosophy of the program.

'Turn the metrics green' was the mantra heard in SupportCo and I was confined to using metrics that were universally applied from the central United States team. Moreover, the central United States team had distributed a report outlining the operational performance on metrics they selected. I knew from my literature review that measuring knowledge management programs was difficult and being confined to activity metrics ensured a challenge ahead.

The participation in the United Kingdom teams continued to grow and I discovered the content being created was not being reviewed in a timely fashion and the United Kingdom teams were complaining of poor quality content in the knowledge base. Figure 5 outlines the responsibilities for solution content evolution.

Figure 5 **Solution Lifecycle**
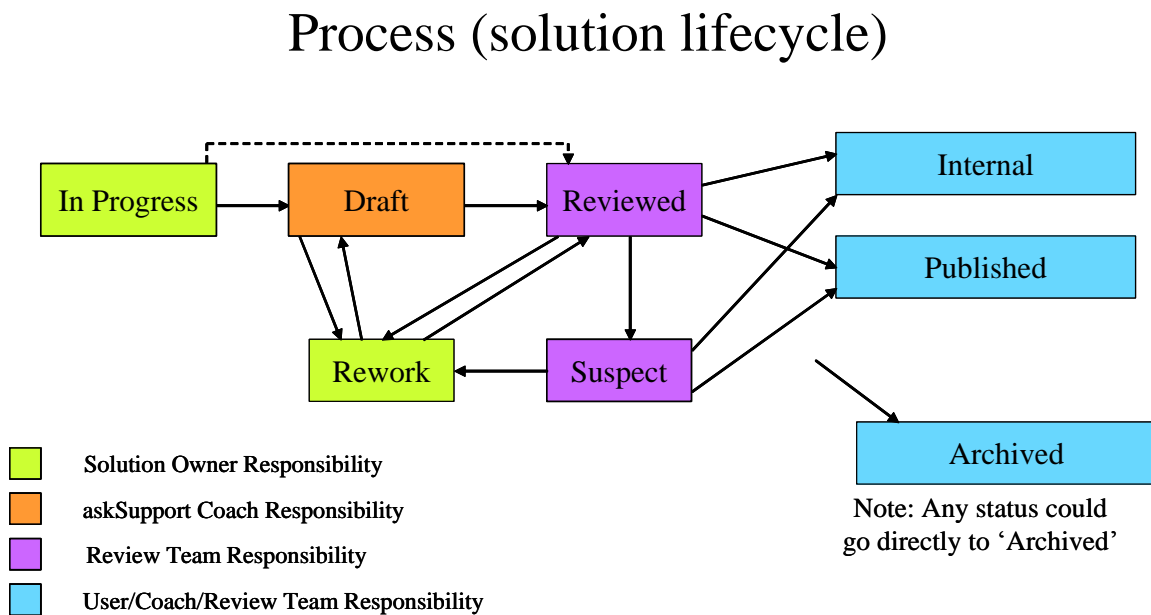
Process (solution lifecycle)

Source: Walker (2007)

Observe

During Cycle 1, I communicated the relationship of the research and the deployment of the AS initiative to all key stakeholders. I started recruiting co-researchers to represent each of the countries and an external co-researcher to support our deployment. We completed the planning activities to develop our first draft of a project definition report and project plan to be the foundation for deployment of the program in Cycle 2 countries.

Our deployment program in the United Kingdom highlighted that there were many issues with the AS initiative that would need to be resolved for the program to be successful. We were successful in increasing participation in the United Kingdom teams and achieving the metrics incorporating greater participation (workflow), content review (created to published timeframe) and customer self-service participation.

Reflect

Owing to budgetary constraints I was forced to carry out the project planning activities via conference calls and online tools. This restriction made it difficult to plan activities and maintain the motivation and energy required to complete such an intellectually demanding exercise. The time taken to develop the PDR was extended owing to the lack of time the co-researchers had available and my own time restrictions due to my dual roles. Moreover, the co-researchers were not fully conversant with PMBoK and this further delayed progress as I 'trained' the community. The co-researchers did not initially understand the value of reflecting on practice because it was not considered productive work and was not a cultural norm in SupportCo.

The planning activities highlighted the difficulty in packaging a knowledge management initiative to fit the framework of a product breakdown structure (PBS) and executing discrete

work packages. The dynamic and contextually significant nature of knowledge complicated the application of PMBoK, and arguably restricted creativity and innovation.

SupportCo management was not comfortable with the planning rigour throughout Cycle 1 and was looking for short-term financial results. I had difficulty demonstrating short-term tangible results because I had to report results consistent with the central United States team, and these were activity-based and not value-created. I began to understand the challenge I had with reporting tangible results on a project that predominantly produced intangible results.

I conducted an after-action review for Cycle 1 to formalise learning from our deployment activity to ensure we could apply the valuable lessons to Cycle 2. After-action reviews are used by many organisations to facilitate a structured method to learn from past experience. The after-action review incorporated four steps:

- What was supposed to happen?
- What actually happened?
- Why was there a difference?
- What could we learn from this?

The after-action review highlighted a diverse opinion on all four steps and, surprisingly to me, a diversity of opinion regarding Step 1. We captured the key learning points as:

- There were no success stories associated with the program.
- The AS initiative needed to be an agenda item for management meetings.
- Training material needed to be updated and 'live' delivery increased as community understanding after online training was very low.
- Compulsory management training about the program needed to be instigated, and possibly a certification element of management development programs.
- A live demonstration of value was required, including a presentation of search and retrieval, and how the AS initiative would make the support community's job easier.
- A dedicated program lead for Europe was needed, with project resources where required.
- The need to clarify the type of support knowledge to be captured.
- Identifying what value and knowledge did the initiative bring to the organisation.
- There was a need for greater integration with other knowledge management initiatives.

- The rollout would take an intense effort, with constant follow-up and policing because accountability was low.

During Cycle 1 organisational changes were occurring at all levels of the organisation and this created a climate of uncertainty and delayed our deployment and reporting ability.

In addition to the after-action review I facilitated a session to uncover the barriers we identified during Cycle 1 to generate an understanding of the issues that we would need to overcome for Cycle 2 and allow its output to be a foundational document that would allow us to confirm/disconfirm the major barriers throughout the three cycles.

Conclusion

The knowledge management implementation in the United Kingdom focussed on developing knowledge as an integral process of delivering customer support services combined with developing the project management planning documentation. The deployment in the United Kingdom uncovered a number of barriers:

- success based on metric achievement
- budgetary constraints
- difficulties in communicating success of program within SupportCo's reporting frameworks
- low senior management commitment
- determining what knowledge to capture and reuse
- inconsistent delivery of the full portfolio of knowledge management programs in the organisation.

Deploying knowledge management programs is an extremely complex and challenging task especially in a culturally diverse organisation covering multiple countries. Knowledge management needs to be aligned to business processes and integrated into operational delivery models with specific outcomes demonstrating value to the organisation. Senior management need to provide visible support and ensure knowledge management outcomes are integrated into business reporting frameworks demonstrating value creation.

Participatory action research is an effective model to facilitate research and project delivery however commitment from the organisation may be problematic as the rigour required may cause concerns for senior management. The plan, act, observe and reflect cycle provides a framework to ensure continual learning and that lessons learnt are applied to the following phase of the project. Reflecting on practice using tools as after action reviews provides a mechanism to ensure the project team are continually learning from their experiences.

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