

# WEBTIE: A FRAMEWORK FOR DELIVERING WEB BASED TRAINING FOR SMES

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**Abstract:** A yearlong pilot project undertaken in the UK set about delivering online training to 100 Small to Medium sized Enterprises (SMES), which equated to 500 employees, all within Manufacturing. The ‘Cawskills Project’ delivered online IT training directly to employees. The findings from the project have informed the development of a generic but adaptive model for SMES to facilitate the need for training by considering the operational demands, resources constraints and infrastructure. This paper presents a model, which brings together principles of teaching and learning practices evident in classroom based education along with the learning requirements of SMES and employees. The incorporation of online learning aims to deliver training content, which is Just in Time (JIT) and proposes training events informed by SME’S strategic direction.

## 1 INTRODUCTION

The need for training in every industry sector is imperative to equip companies for a sustained competitive advantage (Pedler, Boydell and Burgoyne, 1998). In the light of globalisation, the Manufacturing industry now acknowledges the need for training (Khan, Bali & Wickramasinghe, 2007). However, with a ‘myopic’ view of strategy, operational demands and resource constraints, the ability to take on board the level of training evident in larger organisations puts Small to Medium sized Enterprises (SMES) at a tremendous disadvantage (Mazzarol, 2004:1). The UK Department of Business Enterprise and Regulatory Reform (BERR) define SMES as “a business with fewer than 250 employees” (Berr, n.d). A SME needs to fulfil two of the three conditions below to be defined as an SME:

1. A turnover of not more than £22.8 million net;
2. A balance sheet total of not more than £11.4 million;
3. Not more than 250 employees.

The Manufacturing industry as a whole, accounts for about 23.5% of employment in the UK. (Berr,

2005) The reduction in the workforce within Manufacturing (Leitch, 2006; Flegel, 2006) has led to the changing nature of work organisation in particular influences of assembly line production. Jones (2001) argues with JIT production, non-value added activities are eliminated to allow the business to address demands for “shorter cycle times, quicker decision points and more rapid deployment of services and solution” (2001:481). We can apply a similar technique to delivering training in the light of advances in ICT and the exploitation of the Internet. JIT training should be available on demand, be a more comprehensive training approach associating training with work performance requirements. Jones states that though JIT training is delivered on an expedited basis, it does not mean that the design process should be circumvented. To help in the design process, Jacobs (2003) proposes a model for job related training. On the Job Training (OJT) has many advantages primarily the training is tied with work practices and so has a positive impact on individual’s motivation. OJT the process in which, usually the, supervisor “...passes job knowledge and skills to another person. (Jacobs, 2003:14). This form of unstructured and most often

informal training gave rise to Structured OJT (S-OJT).

S-OJT is the planned process of "...developing competence on units of work by having an experienced employee train a novice employee" (Jacobs, 2003:28). However, there is a need to link training provisions to both training objectives and business goals, thus we have relevance of training. The training relates to the ability to perform specific units of work with emphasis is on one-to-one training (trainer and trainee relationship). It makes use of a planned process rather than ad-hoc explanations of work activities as with OJT and so are regarded as a broad platform for enabling workplace training. One consideration S-OJT fails to make is the way in which the training should be delivered. Despite the fact training should be work situated it does not go further to explain how to deliver the module content nor does it not consider individual's learning style. Despite the training takes place in the organisational context, the content is not associated with the organisation's mission and objectives. S-OJT does not go far enough to be reactive to changing needs on a timely fashion. Though, the need for training is recognised, it is not supported by SMES current working practices, culture, resources and training provision. They do not have the time nor investment to generate bespoke training programmes as mirrored in larger organisation. As such, SMES look to initiatives within the local area, which may cater for their needs. SMES require a delivery mechanism, which will not only be adaptive but also be responsive to their needs.

## 2 WEBTIE

To address these issues we present a generic adaptive model for SMES to deliver training within the working day by utilising online learning technology and underpin the training content with Instructional design principles and learning theory. The model encapsulates the specific learning needs of employees and correlates them with the business strategy. The proposed model will enable the delivery of in house just in time training right to the desktop. This design has been utilised to deliver online training to manufacturing SMES in the Coventry and Warwickshire region in the UK. The informed design came about after the completion of a yearlong training programme 'Cawskills Project', with 100 SMES totalling 500 employees. The training encapsulated European Computer Driving

Licence (ECDL) as the training content. The development of the portal brought together four main components: Learning content; Support forum; Instructional Support and Technical Support. Different people handled the management of these four components but the goal was to bring them together seamlessly. From the outset, we were delivering a complete package, but from a design point of view, we had a number of components from different sources brought together until the portal.

Figure 1 shows a Web Based Training Environment (WebTiE) model used to deliver training to SMES.

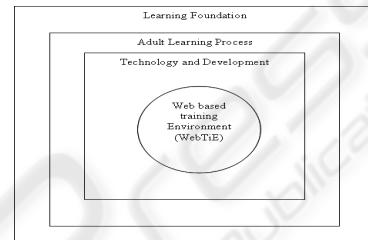


Figure 1: Training Development Model WebTiE.

The model has three distinct layers they are: Learning Foundation; Adult Learning Process and Technology and Development. Each layer is concerned with the development process and ultimately the incorporation of these layers will bring about the development of WebTiE, a training portal for SMES to undertake online training in-house at the desk, perhaps at home or at other office branches. The training will be specific to the individual's and SME'S learning needs. Over time with changing needs the portal will adapt to new arising requirements and challenges.

The Learning Foundation is an understanding of the business, its mission, aim and objectives; its focuses on change management and adapting culture to allow for training. Above all, it is important to understand the training requirements and their fit with organisational requirements.

Adult Learning Process brings together Andragogy, Behaviourism, Cognitive Theories, Constructivism and Social learning to underpin instructional design principles of the online training. As previously stated, SMES operate at an operational level and so have very limited time for training, by optimising the instructional design we are maximising the efficacy of the training event.

Technology and Development is both constrained and enabled by the SMES' ICT infrastructure. The delivery mechanism must be in place before any training is embarked. The

development relates to the employer planning for the training events. Each individual who is to take training must be permitted time away from their job. The employer and employee jointly need to plan how this will happen.

### 3 HOW TO USE WEBTiE?

Figure 2 shows the main components to training development, the design of which has been informed by software engineering principles of information systems design and development.

To illustrate how each phase above relates to Figure 1, Table 1 maps the stages of the above model against the three main components defined in Section 2.

Table 1: Mapping of WebTiE phases

Feasibility	Learning Foundation Technology & Development
Analysis	Learning Foundation
Design	Adult Learning Process
Development	Adult Learning Process Technology & Development
Implementation	Technology & Development Also, it is part of the core of the model
Evaluation & Feedback	This stage can bring about iteration of the entire developmental process.

#### 3.1 Feasibility

Phase 1 of the training programme model seeks to establish a platform upon which training programmes will be developed. It is a process, which seeks to implement change in the organisation's culture to bring about a 'Learning organisation'. This stage requires commitment from the employer and employees alike who without which the success of the programme will not work (Hutchinson & Purcell, 2007) nor will there be the ownership of the system (Pressman, 1982; Mullins 1999).

There are three key components to this phase:

- Culture change and commitment
- SME mission and external business impact
- Technology

We are seeking to build an infrastructure or environment within which training can take place, by addressing the changing culture in readiness for training and determining the strategy of the business, you are modelling the infrastructure.

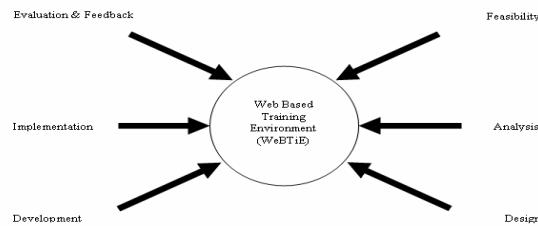


Figure 2: Phases of WebTiE.

A number of issues need to be addressed prior to the development of the training programme to ensure employee's readiness:

1. Do I have the time and financial investment for training? (Investment and time to enable employees train)
2. Are my employees willing to undertake training? (Change management and culture)
3. Would I (the employer) like my employees to undertake training? (Employer led training)
4. Do I have the IT infrastructure to enable the training? (IT Infrastructure)

It is important to acknowledge these issues as they enable the employer to demonstrate the business readiness for training.

#### 3.2 Analysis

Once the SME has the appropriate infrastructure as defined in section 3.1.2 the assessment of training requirements can commence. The assessment process seeks to determine the skills requirements of employees within the context of their job. A Training Needs Analysis (TNA) (Reid & Barrington, 1997) process would shed light on whether or not a skills gap exists. Attention needs to be given to tools used within the job and the extent of its use by the employee. SMEs need to ensure that technological understanding of employees is proficient enough. All training the employee undertakes needs to link with the SMEs' aim and objectives. Therefore, a two-fold assessment process needs to take place. Many initiatives such as those by Business Link are able to undertake TNAs, free. This is particularly beneficial to the UK SME where time and resources are already clear constraints.

##### 3.2.1 Individual and Organisational Learning Needs

Training Needs Analysis will help to determine the training requirements of the organisation and individual employees in relation to the job requirements and business requirements. The

analysis of this will identify one of two things. Firstly, individual training requirements and secondly commonality training requirements throughout the business. These requirements will then need to be prioritised. To help in prioritisation a useful technique to use is MOSCoW (Howard, 1997; Ash 2007). Its' development is attributed to Dynamic Systems Development Methodology (DSDM), a management and control framework for rapid application development. The most important training requirements, the 'Must have' would be the requirements for which training must be sought immediately as these are fundamental to business success. This process is carried out on a timely basis and informed by previous training evaluation activities. However, it is important to note that the training requirements identified need to be linked to the SME's strategic direction. The second process during this phase is to ensure that those people selected for training have the appropriate access to the training portal. This process will involve both the employer and employee. By involving the employee in such decision making you are motivating the employee and giving them ownership of the training process.

### 3.3 Design

As shown in Table 1, the design phase is part of the Adult Learning Process. SMES are unlikely to have the time and resources internally to develop tailored content for employees, as may larger organisations. The training content remains relatively static and so the SME needs to consider Instructional Design issues may vary. This phase brings together three main components: Instructional Design; Instructional Support and Event Learning Plan.

Once the training has been identified and the infrastructure is in place can the employer seek the training vendor. To determine a potential vendor we need to ensure the training content fulfils the individual learner's requirements and organisational mission. As previously mentioned there are numerous online training programmes already available but none, which can cater for the individual SME. The aim is to build a suite of training programmes, the portal will become a portfolio of training requirements, which caters for SMES' learning requirements. Up until now, the model has addressed internal factors of the business, which hinders training, we now look externally for learning content that fulfils our learning needs. Previously SMES gave little focus to what training was required and how this will benefit the business.

We now have a clear understand of both and therefore a clear focus on what we need from the training vendor.

Once the potential training vendor has been identified, the SME will need to work closely to bespoke the training to their requirements. This is not simply a process of tailoring the interface but moreover tailoring the delivery process.

#### 3.3.1 Instructional Design

The principle aim is to deliver a training experience, which has been optimised by adult learning theories. Pedagogic principles evident in classroom-based teaching tend not to consider previous knowledge and experience of trainees. Andragogy (Knowles, 1990) relating to how adults learn can be embedded in training programmes. Andragogic principles take the matter of previous experience and knowledge as one of its core considerations. This will help to ensure the delivery of training is of a high quality through optimal learning but within the parameters business.

Below is a list that provides generic instructional design principles to be used in the development of the training content. The list incorporates theories relating to Constructivism and Usability. It also considers the development of a learning organisation and a Community of Practice (CoP) (Wenger, 1998).

- Use of S-OJT to allow for JIT training.
- Customisation and Modularisation of learning content (Dabbagh, 2007; Miller, 1956;).
- Clear links between modules and objectives and linking of modular objectives to business mission.
- Consideration of previous knowledge and experience in defining training programmes for employees.
- Promotion of deep learning through linking of training with work practices.
- Option for restarting the training programme at varied user defined points.
- Consistency within the portal. Eliminating of unnecessary icons, features or graphics keeping the interface simple and easy to follow by removing unnecessary functionality.
- Content a combination of textual and graphical with sound controlled by the trainee.
- Minimisation of scrolling enables the mimicking of reading of a book.
- Hyperlinking to make connections between sources, thus supporting understanding of key concepts and the cross fertilisation of ideas.

- A mechanism of feedback is required, which is individualistic and constructive hence promoting motivation.
- A process of assessment needs to be embedded to allow the trainee and trainer to ascertain the degree of knowledge acquisition balanced by the learning content and time constraints of trainees.
- Need for certification or qualifications marking the end of training events (Young, 2002).

These suggestive guidelines are not designed to change the learning content but to tailor it to the needs of the SMEs learning style and optimisation of learning.

### **3.3.2 Instructional Support**

A learning support system in the form of emails, discussion forum and face-to-face support with the trainer is required. Just as in the classroom environment, trainees seek support from one another to problem solve; the same opportunity needs to be present online. The use of CoPs encourages the exchange of ideas and problem solving to help in the application of training to work based practices (Wenger 1998).

The application of Hybrid delivery will help learners with limited experience in such training. Phased classes scheduled for the trainees provide the opportunity to meet with the trainer and other trainees at the SME location to receive some remedial help. One vital face-to-face class that must take place would be the first initial contact with the trainer. As we found in our fieldwork the introductory training class was both well received with trainees and helped to motivate them. It also gave the opportunity to alleviate early teething problems with logins and general use of the training portal.

The training vendor is required to provide technical support, a surety to the employer who may not be technically proficient themselves that help is at hand.

### **3.3.3 Event Learning Plan**

A training plan needs to be produced to define when an individual can take time to train. This helps both the employer focus on releasing an employee for training and for the employee to understand that the employer has invested in them to take time away for training and that this is their time for that. The Learning Event plan can be as formal as the SME needs it to be to manage training and evaluation. Clearly, there are benefits to recoup if the document

is formalised, as it will clearly set out who is doing training, when and their progress.

## **3.4 Development**

Phase four, the development of the training environment needs to be informed by the SME. As the trainer vendor develops this, they need to collaborate with the SME. Unlike off the shelf training SMES should seek to having bespoke training. For this reason, they are stakeholders in a programme development. The software should be tested in collaboration with end users. The testing and involvement process will give ownership to the trainees and preparedness of the impending training.

## **3.5 Implementation**

Phase five, requires the collaboration of all stakeholders. As with any software development and implementation, this process requires delicate handling. Both the training vendor and the SME should agree the implementation technique. However, whichever method is used to implement the programme appropriate technical support must be to hand to eliminate both bugs and to address finalised tailoring requirements.

## **3.6 Evaluation & Feedback**

The employer and employee alike who undertake training need to evaluate the progress of training and whether further training is required. The process need not be a formal method of assessment. We propose a phased process paralleled with the completion of new modules. This process can be employee instigated who will undoubtedly identify areas of improvement in their working practices and bringing this to the attention of the employer will aid on the way to job enrichment. The evaluation process will adapt the Kirkpatrick's model (1996) aiming to measure reaction, learning, behaviour and finally the results ascertaining the effects on the business resulting from the trainee's performance. To take the benefits of the training into the business you must look to changing processes. This process can be repeated to see whether the change has been effective and beneficial or not.

Subsequently, we can return to the second layer of WebTiE, where we once again focus on learning needs (TNAs) if additional requirements identified then we can repeat the process of training until a level of satisfaction has been reached.

## 4 CONCLUSIONS

The proposed generic framework aims to fulfil the learning and organisational learning requirements of SMEs. Competitiveness and economical factors which stand in their path must be overcome by driving flexible JIT training for better productivity and operational effectiveness in the face of globalisation. It is not simply a question of acquiring a set of technical skills, but rather a process of reflection and review of current practices that are informed by better ways of working. The creation of knowledge need to be a collective activity, where employers and employees alike exchange ideas, share problems and solutions (Wyer, Mason, Theodorakopoulos, 2000).

The importance of training is acknowledged by SMEs, however, the provision available is much criticised as lacking quality and relevance. A training program with a sound underpinning will optimise the training experience. Swanson argues that on the job training and learning is vital to businesses and therefore "training is about creating expertise, not simply pouring knowledge into people" (Zemke, 2002: 87). Businesses who report difficulties in recruitment and skills gap need to start to look inward in up-skilling rather than outward to recruitment. Investment in training employees does have a return on investment in the shape of better productivity, staff retention, and motivation (Leitch 2006). The continuing down turn in manufacturing will remain until UK SMEs are in a position to rival the international manufacturing industry once more.

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