

# OPUS online WIL management system supports requirements of ISO 9001: 2000 for quality assurance

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***Abstract* — Achieving quality in work-integrated learning (WIL) (internship/placement) is concerned with initiating and managing the emergence of a win-win-win situation for all participants, especially for the student and the provider. It is essentially concerned with quality assurance throughout the processes which yield these desired outcomes. The international quality management standard, ISO 9001:2000, sets out requirements for achieving quality assurance and improvement in products and services and it is being used by many diverse organisations worldwide. OPUS is a fully online system for the management of work-integrated learning to allow all participants to own and manage their information. Providers may advertise their vacancy, students may create their CV and apply online and the WIL administrator may place a student following the selection process. Other features include providing multi-media resources, E Mail communications and assessment design and implementation. Many of the features are particularly valuable for out-of-term-time activity and all are achieved by paperless procedures. WIL administrators are able to monitor activity, generate reports and archive records. In this paper the functionality of OPUS is developed to show compliance with selected requirements of the standard ISO 9001:2000. The case for assurance of quality in WIL is argued through the use of OPUS. Evidence of quality achievement and endorsement for OPUS by ASET (Association for Sandwich Education and Training) (the UK's professional body for WIL practitioners) is presented.**

**Keywords** — work-integrated learning, placement learning, quality assurance, quality management, ISO9001.

## I. INTRODUCTION

Attainment of quality and the emphasis on quality management have moved to centre stage over the last 30 years. The concepts of 'Total Quality', 'Six Sigma' and 'Business Excellence' continue to play a significant role in achieving quality in products, services and processes. Most significant on a world-wide basis is the application of the family of International Standards for quality management, ISO 9000: 2000. Since first introduction in 1987 many countries and organisations have developed independent third-party accreditation and certification schemes for the issue of certificates to organisations which are seen to implement the requirements of ISO 9001. Such has been the success of this standard that the International Organisation for Standardisation (ISO) is able to claim that "...ISO 9000 and ISO 14000 families are among ISO's best known standards ever" (ISO, 2007). Specifically, 'The ISO Survey of Certifications 2005' shows that 776,608 certificates had been issued by December 2005, representing a growth of 1650% on the December 2001 figure (ISO, 2006). Clearly, ISO 9001 has a well-established and growing impact on quality attainment in many organisations. To use its own words from Clause 1.2, "All requirements . . . are generic and are intended to be applicable to all organisations, regardless of type, size and product provided" (ISO, 2000). It is, therefore, not unreasonable to consider the application of the requirements of this standard to the environment of work-integrated learning so as to inform basic assurance as a minimum.

## II. MANAGEMENT OF WORK INTEGRATED LEARNING

By its nature WIL seeks to achieve a win-win-win outcome for students, providers and academic institutions. This can be realized only by a series of inter-related processes that involve the three partners over the pre-, during- and post phases of the period of work-integrated learning. It is appreciated that there are different titles and descriptions for practices under the heading of WIL, but for the purposes

of achieving quality, many generic processes are relevant to all. For many practitioners these processes can be time-consuming, bureaucratic and tedious, but for others the use of a flexible, internet-based system has revolutionized procedures and the impact on WIL management. This paper considers how OPUS (Online Placement University System) supports identified requirements of ISO 9001: 2000.

OPUS, developed at the University of Ulster, is a secure internet-based system for managing all aspects of WIL. Students, providers, academic staff and assessors have secure access and control of their part of the information. An approved provider may promote a vacancy and a student may bid for it using their online CV. The provider may view and E Mail (or print) the CV to selectors and call the candidate to interview using the comprehensive communications features. Students in the workplace have visibility of all the information needed for employment, academic and progression requirements. Academic and work-based assessors may report online and give immediate feedback to the student. The WIL manager maintains overall control and may intervene to monitor or edit all processes when necessary. OPUS has comprehensive records and reporting features with scaled levels of access and authority for administrators.

### **III. APPLICATION OF OPUS TO THE STANDARD**

In considering the relationship between OPUS and the requirements of ISO 9001 three types of support may be identified:

- Type 1 requirements which are directly supported by the features of OPUS,
- Type 2 requirements which are not directly supported by OPUS but are more readily achieved due to a feature of OPUS, and
- Type 3 requirements which are not impacted by OPUS as their implementation rests wholly in management action.

The following analysis relates the features of OPUS to Type 1 support.

## **Clause 4: Quality Management System**

### **4.1: Identify processes and determine their sequence and interaction**

In OPUS the sequence of activities from pre-placement until return to studies is sequenced and inter-linked to provide support to users and prevent careless or incomplete actions or information. OPUS is designed to provide only the necessary information required by each type and level of user, thereby avoiding information overload. All data is held securely behind username and password controls. The structure of the directories for students, staff, companies, contacts and administrators, with integration for information flow, is arranged to ensure that any piece of information is entered only once and then made available in the correct sequence when requested. For example, a vacancy cannot exist without a company (provider), a student cannot bid for a vacancy if they do not have a completed CV, a student cannot be placed if they have not bid for the vacancy, a company contact cannot view the CV of any student who has not bid for their vacancy and a member of academic staff may not see details of any student who has not been assigned as their tutee. Many other features in OPUS utilize similar principles.

### **4.2: Documentation**

WIL activities are specified and documented to inform, instruct and guide all participants on topics such as the nature of the required work experience, procedures for acquiring a placement, assessment strategies and guidance for all supervisors. Approved documents for any purpose may be placed at *OPUS/Information/Resources* and made available to specified types of user, eg, staff, student and/or contact and segregated for specific courses or groups of readership. The preparation and approval of any document lies outside the provision of OPUS and remains a management responsibility.

### **4.2: Document Control**

By using the 'Resources' capability OPUS ensures that only one version of a document exists at one time for one set of circumstances, thus avoiding conflicting statements/requirements and the conse-

quential confusion. Resources may be general or specific to a company/vacancy and may be placed in either category. In fact, any document that can be made as an Adobe Acrobat pdf file may be placed in 'Resources'. Further, the level of top administrator may specify the file MIME types to include multimedia files for added communication effectiveness. When documents become obsolete they are removed by an authorized administrator.

#### **4.2: Records**

All records of students, companies, staff, assessment, vacancy bids and many other transactions may be held until the top administrator decides to remove them to archive outside of OPUS. Within OPUS student courses may be 'archived' (ie, removed from constant visibility and use) by an authorized administrator, but may be recovered when needed for search or audit purposes. University policies supervise the data backup activities to prevent data corruption, loss or compromise.

### **Clause 5: Management Responsibility**

#### **5.4: Planning**

Planning is a management responsibility outwith OPUS, or indeed, any IT-based system. Nevertheless, the information and reporting features of OPUS enable the WIL manager or administration to assess the facts on students placed or not placed, vacancies available, reports completed, assessment status and many other statistics. Data may be exported to a spreadsheet for further manipulation and analysis. This information will enable timely planning at the start of the academic year or at later times so as to achieve the set objectives for the WIL programme.

#### **5.5: Responsibility, Authority and Communication**

All participants in WIL need to know their responsibilities and, in some cases, these need to be known by other groups also. The 'Resources' feature provides the means of placing any pdf document for viewing by specified users of OPUS.

## 5.5: Communication

OPUS provides several means of communication with users:

- a. Home Page Announcement. The administrator may write an announcement for a specific user type at any time and have it appear in their Home Page immediately, ie, no webmaster or IT specialist is involved. This feature is valuable for making announcements, giving updates and publishing requirements, including direction to specific documents in 'Resources'. Of course, the targeted reader will not see this information until they login to the system.
- b. Home Page Update. On each login the student and administrator is presented with a listing of changes which have occurred to companies and vacancies since their last visit. This prompts each to consider the related details and decide on further action; for the student this will be the decision to bid or not for a vacancy.
- c. E Mail. The administrator may send messages to individual or selected students or other individual users and a record may be retained. In addition, a company contact may use OPUS to send an E Mail to a student to inform him/her of an interview or other decision on their bid. This E Mail feature is presented automatically to the contact after closing a student CV. The E Mail addresses of the student in the workplace and of the supervisors (academic and workplace) are visible to each other.
- d. User Activity. The administrator at OPUS/*Information/System Status* is able to see a listing of last users organized by category – admin, staff, contact and student. This is particularly valuable to ascertain which companies have been active recently on the system thereby allowing a follow-up to secure 'business'.

## 5.6 Management Review

The management review, a management responsibility, requires information; some of this can be obtained easily from OPUS or from the exported spreadsheet.

## **Clause 6: Resource Management**

### **6.1: Provision of Resources**

All users of OPUS are ‘customers’, but especially students and organisations providing WIL experience. This sub-clause requires ‘customer satisfaction by meeting customer requirements’. OPUS as a whole gives the WIL manager/administrator a resource to control all aspects of learning in the workplace while specific features provide a resource for students, companies, staff and assessors to carry out their responsibilities with the availability of online guidance and support. Support may be accessed using the ‘Help’ facility to identify and contact the most appropriate person. As an indication of customer satisfaction a selection of user comments is presented at Appendix 1.

### **6.2: Human Resources**

An aspect of this requirement focuses on the competence of all personnel affecting quality; in the case of WIL this includes all users of OPUS, with the possible exception of students. While the appointment of personnel and their training is a management responsibility (ie, Type 3 support in the context of this paper) much of their guidance is provided from OPUS/*Information/Resources* and their processes are controlled by the features and structure of the system.

## **Clause 7: Product Realisation**

### **7.1: Planning**

Planning for all aspects of WIL is essentially an off-line matter within the responsibility of a course team and academic school/department staff. However, specific planning for student cohorts, WIL needs and staff support is enabled using the data and reporting functions of OPUS. Available records and export of data to a spreadsheet ensure that “the output of this planning is suitable for the organisation”.

### **7.2: Customer-related Processes**

This sub-clause identifies ‘determination of requirements’, ‘review of requirements’ and ‘customer communications’. These actions are central to achieving the win-win-win outcome for a student and WIL provider (and the academic institution).

The general requirements for a WIL experience, being pre-determined, can be placed in OPUS/*Information/Resources* for access by all users. The promotion of a vacancy by a provider is their opportunity to specify their requirements of the job and characteristics of the successful applicant. These vacancies are viewable by all OPUS users, especially students.

Review of requirements, ie the details of any vacancy promoted on OPUS, may be considered by the WIL manager/administrator to establish if the vacancy is suitable for WIL, the information provided is adequate for the student to make an informed decision and the student knows what action to take to apply. To enable this review on OPUS, the administrator is able to see on their Home Page at each login changes which have occurred to providers (companies) and vacancies.

Communications in OPUS have been identified under sub-clause 5.5 above. Having made an original entry of communication data this is now available in one resource for easy use at any later time.

### **7.3: Design and Development**

Course planning teams and academic departments will normally hold the responsibility for the design of the WIL experience in general. However, any specific WIL experience for a student will be planned prior to commencement, or soon after the start date to enable a more flexible approach to accommodate the student’s and provider’s needs. Features in OPUS and especially in the linked PDSys-tem enable the student to engage in personal development planning. When done in conjunction with the WIL provider this enables the student to gain a quality experience within the general aim and learning outcomes of the WIL programme. OPUS provides information and records progress and the linked online programme, the PDSys-tem, enables student planning, reflection and recording of comments (including many other related activities, such as CV preparation).

#### **7.4: Purchasing**

For an academic institution providing a WIL programme the activity of ‘purchasing’ may be analogous to agreeing to accept a WIL partner to provide opportunities for their students. In the United Kingdom the Quality Assurance Agency for Higher Education (QAA) states this responsibility as, “Awarding institutions ensure that all partners providing work-based and placement learning opportunities are fully aware of their related and specific responsibilities, and that the learning opportunities provided by them are appropriate.” (QAA, 2007).

Within OPUS the practice of ‘approving a supplier’ is that a potential provider is not entered and enabled in OPUS/*Directories/Companies and Vacancies* until the WIL manager is satisfied that the organisation meets the criteria to be a provider. These activities are conducted off-line by appropriate academic staff. Following experience with a provider gained by academic staff visits and feedback of the student’s experience the WIL manager may decide to continue or end the partnership. Facilities in OPUS allow for the disabling of a listed provider. Of course, communications between the WIL manager and the provider would occur at all stages of this review.

While a provider may be ‘approved’ the review of specific vacancies offered by him is subject to the process detailed under sub-clause 7.2 above.

#### **7.5: Production and Service Provision**

In general terms the requirements under this sub-clause relate to the conduct of the pre-, during- and post WIL phases in which requirements are made clear, correct information is provided, progress is monitored, advice is given and assessment is conducted to enable satisfactory completion and progression to the next stage.

OPUS supports these requirements by enabling providers to promote vacancies, students to prepare their CV and bid for vacancies, staff to monitor and control the processes and assessors to report and give feedback. All these activities are supported with the provision of specification documents in ‘Resources’ and flexible communications.

## **Clause 8: Measurement, Analysis and Improvement**

### **8.2: Monitoring and Measurement**

In the context of WIL monitoring and measurement may relate to the use of the processes and to the student performance against the assessment plan. Other monitoring may include performance of providers and academic staff against timelines. Central to any measurement is the creation of a record to indicate that the monitoring has been done and that the achieved value is acceptable.

Within OPUS there is a comprehensive provision for the design and operation of a student assessment plan. This includes the ability to allocate an assessor within the academic institution or the workplace, allocate marks and provide formative and summative feedback online. The data for a given cohort of students may be exported to a spreadsheet for further manipulation.

Activity by all users may be monitored by the WIL manager and a deep search on activities on OPUS by a student may be conducted when necessary. Progress on a student's bids for vacancies is displayed graphically and the last visit by all users is presented. This is particularly useful to monitor a student's progress and identify where advice may be necessary. Students are able to see if and when their CV has been viewed by a company and the company may give direct feedback on progress of their bid. In essence, any user may find much time-dated information to enable 'customer satisfaction' activities.

As OPUS maintains comprehensive records it is possible for any independent party to obtain 'objective evidence' as part of an audit on any part of the WIL procedures and processes.

### **8.3: Control of Non-conformance**

The reporting and assessment features of OPUS identify where a planned activity has not been completed. This includes the completion of assessment results for the student and the completion of activities to targets by students, academic staff and workplace assessors. Also, students who have not achieved a WIL place are readily identified.

Having identified the non-conformance through OPUS the WIL manager is able to apply ‘corrective action’ to the problem using off-line means – usually persuasion in the experience of the authors!

#### **8.4: Analysis of Data**

As discussed earlier, reports and data export may be obtained from OPUS. Exporting to a spreadsheet enables all the functionality required to present information, identify levels of activity and chart trends.

#### **8.5: Improvement**

Two improvement areas may be identified here – improvement in the WIL procedures and experiences for the student and improvements in the features of OPUS.

On the latter, OPUS was developed to manage the Industrial Placement programme for the School of Electrical and Mechanical Engineering at the University of Ulster and was first used in 2002. It has progressed to the imminent release of version 4 (at time of writing) with many new features being added in each release and many more planned.

On the WIL experience, the visibility of information provided by OPUS and user feedback has enabled a more-focused placement programme to develop to meet growing demands from providers and increased satisfaction from students. This year-on-year improvement is set to continue with the support of OPUS.

### **IV. CONCLUSION**

While the standard ISO 9001: 2000 claims to be “applicable to all organisations, regardless of type, size and product” and “wherever the term ‘product’ occurs, it can also mean ‘service’” it still requires interpretation to the context of work-integrated learning. Nevertheless, the standard specifies activities which must be managed to assure quality for the customer and to reach rising levels of satisfaction. The win-win-win outcome for WIL can be achieved when those aspects which affect quality are

planned, controlled, monitored and improved. This paper has attempted to relate the features of OPUS to the requirements which are not wholly dependant on managerial action. Unfortunately, many of the activities surrounding quality assurance have become overly bureaucratic, but it is contended that OPUS addresses the necessary processes in the WIL environment securely, easily, effectively and openly to assure quality experiences.

OPUS is open source software within the terms of the GPL (v2) license and may be obtained free of charge and customized (if necessary) by anyone to meet their particular needs. Fuller details may be obtained by visiting the OPUS web site (University of Ulster, 2007). The sister product, the PDSys-tem, may be viewed at the web site (University of Ulster, 2007).

In the UK, OPUS is endorsed by the Association for Sandwich Education and Training (ASET) as a system which meets the guidance presented in their publication 'Managing Placements with IT and Online' (ASET, 2007).

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## User Comments on OPUS

### Companies

#### **Radox Laboratories:**

The University of Ulster web based OPUS system has proved to be a valuable help to Radox Laboratories. The system is a complete turnkey solution right from the point of Radox posting the placement to the student applying right up until the student returns to the university and has to be accessed.

All curriculum vitae are in a standard format, it lists student discipline, modules studied and grades achieved and this makes the selection process easier and fairer. The system also acts as a time saving tool and requires minimum input from Human Resources and the recruiting department.

The system is clear, well structured and user friendly; over the past 3 years it has proved to be a valuable student recruitment tool for many departments at Radox Laboratories Ltd. OPUS gives the University of Ulster a clear advantage with student placements activities.

#### **AES Kilroot Power:**

I have been using the software [OPUS] for several years and am always impressed at the speed and ease of how we can added, updated and communicate our Graduate vacancies.

I've also noted each year that we get a good match of candidates to vacancies for interview which all goes to making my life as a Personnel Officer a lot easier.

#### **Littelfuse:**

In line with both business needs and social responsibilities, Littelfuse Inc. are committed to developing a continuous pool of high-calibre talent from local and national colleges and universities. As part of this commitment, Littelfuse Ireland works closely with the University of Ulster in placing students for 12 months in our Engineering and IT Departments.

The expertise and assistance in promoting placement opportunities within Littelfuse Ireland has been exceptional. The online and interactive nature of OPUS has proved an invaluable resource in placing students quickly and effectively.

**Terex Finlay:**

As a user of the OPUS Software, I have found it useful to advertise and attract graduates for job opportunities such as industrial placements as well as other job roles.

The system is easy to use and the fact that students can download the application form, complete it and return means it's a more efficient way of processing applications.

**Arntz Belting Company:**

Using OPUS allows us to promote our placement opportunities and keep track of the level of interest shown by students. Students can be easily contacted using the system, saving administration time. The system is easily accessible, simple to use and convenient.

**Schrader Electronics:**

At Schrader Electronics we focus on continually improving our processes and systems. We have found that the on line placement software [OPUS] developed by the University of Ulster has helped us to achieve this by providing an effective, flexible, paperless tool that is user friendly and easy to navigate.

The system allows us to review applicant information in real time which allows us to action these CV's as they arrive. Overall we have found that this has assisted us in significantly reducing recruitment timelines.

### **Mindready Solutions:**

Recruitment of placement students has finally been brought into the 21<sup>st</sup> century with the introduction of the University of Ulster's OPUS system. The benefits of an interactive system, allowing instantaneous updates to all parties, have led to a more efficient recruitment process. With a single update, I can communicate to all involved, both students and placement coordinators and it has saved our organisation significant time and effort. The simplification of the student recruitment process has meant that I am much more likely to seek to employ students again from the University of Ulster.

### **Students**

#### **Colm Higgins, BEng (Hons) Engineering Management:**

I first came into contact with the OPUS software early in second year at university. The CV templates were used to produce well structured CVs to aid in industrial placement through following simple step by step processes. Along with the placement search facilities it was an invaluable resource in gaining a good placement in third year.

Once in placement the system was still being used to liaise with academic supervisors and it also allowed me to manage things such as Placement Reports and supervisor visits. The Resource section provided good information on all aspects of the placement process and could be accessed at all times throughout the year.

**Charlotte Ann Donnelly, BEng (Hons) Engineering Management:**

Personally I found this OPUS system very useful, it had a lot of available industrial positions which could be checked and applied for. The ability to track your applications was also helpful.

Overall, I thought the layout and system structure was very clear and easy to navigate while providing useful information about placement and open positions.

**Simon Kernohan, B Eng (Hons) Engineering Management:**

Throughout the placement I found the OPUS website extremely user-friendly, the CV builder was well structured and very informative. With regards to being placed with a company I found the way that the website highlighted any new additions in terms of placement opportunities beneficial.

**Academic Staff**

**Dr Desmond Brown, Senior Lecturer:**

As a former Industrial Placement Co-ordinator and now an academic involved in visiting students, my impressions of the OPUS Industrial Placement web-based system are extremely positive. It is very easy to use, is reliable, works well and provides at a single point all the information that the visiting academic needs. The fact that it has been specified by a practitioner, who understands the practicalities of the placement process, is very evident. The ease with which one can provide feedback for the students is excellent.

I have also received extremely positive feedback from companies, who for a number of years now have used the OPUS for recruiting placement students.

**Dr Alan Leacock, Lecturer, Advanced Metal Forming Research:**

I've found that OPUS has reduced the quantity of paperwork during the assessment of placement. It also provides a central source of information regarding all aspects of the placement process and therefore helps to keep me organised.

Online assessment provides an effective means of providing feedback to the students during their placement.

Overall the new system has streamlined the entire placement process.

**Placement Staff**

**Dr Ron Cole, Placement Tutor, Sports Studies:**

Prior to 2006/07 all placement information was posted on the School's Placement Noticeboard and e-mailed to the students. This was a time consuming procedure and not an efficient way of providing information to the students. The use of the OPUS system has meant that full placement information can be provided to all students so that they can access it at anytime and it also removes the "middleman" in the application process, as previously myself or the Faculty Placement Officer would be involved in sending off the CV's and collating letters of application.

Overall the OPUS system has made the advertising of placement and the management and tracking of application far more efficient.

**Victoria Devenney, Placement Administrator, Computing Studies:**

Since I started using OPUS 3 to 4 years ago it has helped to greatly reduce the amount of administrative work I previously had to do while managing placements using a manual system. I have found that

OPUS has also improved communication between me, students and employers through the use of the announcement pages. Students have also seen the benefits of OPUS as they can now apply for placement vacancies 24/7 and from anywhere around the world so this reduces the chances of students missing any opportunities.