Introduction to Third International Summit on Software Engineering Education (SSEE III)
Bridging the University/Industry Gap

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ABSTRACT
Innovative University/Industry interactions are examined in this open event with the aim of providing inputs to an international project that is being funded through the United Kingdom’s Teaching Fellowship Scheme. These inputs will support the first stage of the project which is concerned with gaining knowledge of industrial Software Engineering practices and the development of a framework that can be used in the classification and evaluation of such practices.

Categories and Subject Descriptors

General Terms
Management, Measurement, Performance, Standardization.

Keywords

1. THEME AND CONTEXT
The theme for the event is “Bridging the University/Industry Gap”. It will provide a forum for the participants to undertake an examination of the many types of interaction that can occur between Universities and Industry. It will also allow an opportunity to exchange opinions and views on the key issues that relate to each type of interaction.

The event is intended to provide the second participative input into an international project that is being funded through the United Kingdom’s National Teaching Fellowship Scheme (NTFS). A major aim for the overall NTFS project is to develop guidelines and recommendations regarding the identification of proven industry-related best practices and the incorporation of the treatment of these into both undergraduate and post-graduate computing curricula (including curricula that relate to maintenance of competence for existing professionals).

The preliminary work for the project, in which the participants at SSEE III will play a major part, is concerned with the development of a formalised framework that will be used to support not only the documentation of University/Industry interactions but also future evaluations of such interactions and the industry practices that the interactions have highlighted.

2. OBJECTIVES
The prime objectives for the event are to:
• Explore the interactions between industry and academia that will enable knowledge to be gained of industrial Software Engineering practices.
• Evaluate the draft framework generated from the work undertaken at the preliminary event which is to be held during the Conference on Software Engineering Education and Training (CSEE&T 2006) in Hawaii.
• Identifying any further areas in Software Engineering where best practices are most likely to be found
• Identifying any additional mechanisms that could be used in the analysis of the interactions between industry and academia and which would assist in the classification and evaluation of industrial Software Engineering practices.
• Produce an enhanced framework to support evaluation activities.

3. INPUTS AND PROCESS
Potential participants were invited to submit Experience Reports /Position Papers addressing an innovative University/Industry interaction. In their papers they were directed to highlight: successes/failures (highs/lows), lessons learnt, and what was gained by both parties. These Report/Position Papers and short presentations based on them will form major inputs to the workshop. In addition, there will be inputs in the forms of:
• Proformas, which each participant will be expected to complete, which summarise an interaction and the major(s) issues associated with it
The post-workshop report from a preliminary event which is to be held during the Conference on Software Engineering Education and Training (CSEE&T 2006) in April in Hawaii. It is planned that this report will include a draft version of the framework that will be appraised during the ICSE event.

The accepted Experience Reports /Position Papers have been grouped under four themes:

- **Theme 1: Types of Interaction**
- **Theme 2: Projects and Solutions for Industry**
- **Theme 3: Courses for Professionals**
- **Theme 4: Industry Assisting Academia**

An initial session will be held to recap the theme and goals and present summaries of the position papers. This will be followed by a series of structured sessions addressing the above themes. It is intended that these should lead to the definition of an enhanced version of the interaction framework. A key objective will be set for each session, the participants will then break up into activity groups and each group will be allocated a particular topic to consider. After an appropriate time there will be feedback to the full group and a nominated speaker from each activity group will feedback themes emerging from their group’s discussions. Once all the groups have provided feedback, time will be allowed for some for further general discussion.

The workshop will close with a plenary session for all participants. This will discuss progress made, identify future goals and strategies, and obtain opinions on “Industry Best Practices” which should prove useful within the industry orientated part of the project.

A comprehensive post-workshop report will be published later in the year. This report will feed into future planned events associated with the NTFS funded project. These currently include a five-day Working Conference in the UK in early 2007 which will be run under the auspices of Working Group 3.4 within the International Federation for Information Processing (the working Group that is concerned with Professional and Vocational Education related to the Computing Profession).

### 4. FURTHER INFORMATION

The overall aim of the NTFS funded project is to develop guidelines and recommendations regarding:

1. The identification and incorporation of proven industry-related best practices into both undergraduate and post-graduate computing curricula (including curricula that relate to maintenance of competence for existing professionals).
2. Best practice mechanisms for the delivery of such enhanced curricula in a variety of contexts (e.g. remote distance learning).

It is intended that the project will involve two particular approaches: one directed at academics who can interact with industry in many ways, and the other directed at professionals in the software industry itself. The project builds on work that has been undertaken relating to international standards for IT professionals which have been proposed by the International Federation for Information Processing (IFIP). IFIP in the late 1990s produced a document entitled “Harmonization of Professional Standards” [1]. The document highlights six specific areas with regard to professionalism:

- Ethics of professional practice,
- Established body of knowledge,
- Education and training,
- Professional experience,
- Best practice and proven methodologies and
- Maintenance of competence.

The proposals for each of these areas are reproduced in the appendix at the end of this document.

The proposals contained within the IFIP “Harmonization of Professional Standards” document appeared particularly relevant to the field of Software Engineering (SE). Therefore, starting in autumn 2000, a range of activities began, aimed at both promoting and evaluating the IFIP document within the SE community. These included formal conference presentations followed by question and answer sessions, through panel sessions addressing particular aspects, to highly participative workshop events that allowed in-depth analysis of the document. The overall reaction by the SE community has been very encouraging. It has recognised that the IFIP document essentially defines framework or meta model, which should truly assist the advancement of professional standards. An overall summary of the activities and the evaluations of IFIP’s proposals were reported back to IFIP in a paper presented at the 8th IFIP World Conference on Computers in Education in South Africa in June 2005 [2]. However, this initial work raised some significant queries that indicate that further work needs to be undertaken. The main concerns are associated with the areas of best practice and proven methodologies, maintenance of competence, and the educational support for these areas. A paper highlighting the problems associated with “Best Practice” was presented at the 2005 Conference on Software Engineering Education and Training, in Ottawa [3]. It is these types of problems that the NTFS project attempts to address.

### ACKNOWLEDGEMENT

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### REFERENCES


Appendix

Extracts from the document “Harmonization of Professional Standards”


Summary

This document sets out an international standard for professional practice in information technology.

Practitioners who meet the standards will:

- publicly ascribe a code of ethics published within the standard.
- be aware of and have access to a well-documented current body of knowledge relevant to the domain of practice.
- have a mastery of the body of knowledge at the baccalaureate level.
- have a minimum of the equivalent of two years supervised experience before the practitioner operates unsupervised.
- be familiar with current best practice and relevant proven methodologies.
- be able to provide evidence of their maintenance of competence.

Established Body of Knowledge

Several IFIP member societies have published bodies of knowledge, some of which have gained wide acceptance. Such recognised bodies of knowledge are divided into many domains determined by the various services carried out by practitioners. The body of knowledge on which any implementation is based should include at least the common components of these but also ensure that each domain is complete in itself for the domains adopted locally.

Mastery of such a body of knowledge forms the basis of preparation for practice. A practitioner must demonstrate mastery of at least one such domain as well as all core components identified in the body of knowledge.

Practitioners must be aware of and have access to a well-documented current body of knowledge relevant to the domain of practice.

Education and Training

Most practitioners will enter the workforce with prior education and training which will commonly be a baccalaureate degree assessing the mastery of the body of knowledge.

Institutions offering such education and training should be prepared to openly compare themselves to internationally well-known and recognised peer institutions offering similar programmes.

It is recognised that this level of mastery may be achieved by various combinations of education and experience. Nevertheless a practitioner must be able to provide evidence of such mastery to practitioners who have met this standard.

The minimum level of mastery of the body of knowledge must be at the baccalaureate level.

Professional Experience

Experience builds on knowledge in many essential ways. Such as:

- It develops and improves practical skills and competencies.
- It provides understanding of task definition in the users' terms.
- It helps develop interpersonal skills that facilitate the communication and human interaction between all participants.

As many approaches to problem solution are not readily scaleable experience over a wide variety of problem types and sizes is desirable before working in an unsupervised environment. Experience is generally required in assessing task complexity.

Task management, overall project management and quality management generally require experience.

Other professions have clear requirements for experience before allowing their members to practice without supervision.

In addition to a demonstrated mastery of the body of knowledge a minimum of the equivalent of two years supervised experience is recommended before the practitioner operates unsupervised.
Best Practice and Proven Methodologies

Experienced practitioners have identified and documented many practices and methodologies the use of which generally leads to successful project outcomes. Where such best practice and proven methodologies are available the practitioner should use them unless a particular task has exceptional attributes.

Member societies drawing on all available international sources should encourage the documentation and promulgation of best practice and proven methodologies.

*Practitioners should be familiar with current best practice and relevant proven methodologies.*

Maintenance of Competence

To maintain demonstrated competence practitioners must be familiar with new developments in their domains of practice.

Such developments may be reflected in the body of knowledge, best practice and proven methodologies as well as in specific skills.

Familiarity with new developments may be obtained through formal education or peer interaction.

There may be assessment of current competence by formal examination, peer assessment or employer or client acknowledgement of successful work.

A practitioner should participate for at least the equivalent of 10 days per year in activities that contribute to maintaining competence. It is recognised that in different locations the opportunities for such ongoing development may vary.

The standard in each country or region must state how this requirement will be met and the role of the IFIP member society in monitoring this function.

*Practitioners must be able to provide evidence of their maintenance of competence.*