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Origins for the Shared Technology Project

This project was initially conceived to provide an overview of the technologies that are likely to have an impact on the Shared Technology Industries which are:

Automotive	Electronics
Building and Construction	Information Technology
Engineering	Telecommunications
Electrical	

The limits placed upon the scope of research were that the technologies are to be:

- evident in these industries in five years time;
- shared by two or more of the industries covered in this project;
- commercially available in some location in the world; and,
- adopted by Australian enterprises within the time frame.

A series of interviews were conducted with representatives of the Shared Technology industries to determine what are the emerging technologies. Additional reference material was examined to further elucidate the ideas expressed in the interviews.

For online material: <http://www.sharedtechnology.net.au>

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Main Technology Areas

The interviews and literature searches provided a list of technology areas. These are in general terms:

- Skills relating to understanding computer networking are to be shared by all industries included in this study;
- An understanding of the use and management of wireless communications will be increasingly required by people working in these industries;
- Devices in all industries will become increasingly more powerful in processing and distributing data; and,
- The generation of electricity for grid and non-grid connections will become more decentralised and involve operatives in a number of these industries.

The Human / Technology Interface

There is continuing concern expressed by employers regarding the ability of existing workers to be able to learn new skills. This remains an important human variable that will facilitate or impede the adoption of new technologies. Managers of enterprises will continue to make or avoid investment decisions relating to these technologies.

Changes in technology use is evident in all the industries studied but planning for this change is not necessarily in existence. Many observers of technology and innovation have recognised that change is a normal process and have repeatedly called for industries and other supporting organisations to be prepared for change and to anticipate change.

Unfortunately in the industries that have been studied in this report, not all of the enterprises interviewed were planning to warmly embrace these new technologies. It seems that the ability of individual managers and employees to plan for change has not evolved as quickly as the technologies that they will be using in the near future.

Implications for Training Package Development and Reviews

Training Packages and the standards contained in them reflect the competencies required by enterprises for the use of technology within the workplace. This project has identified the new technologies that will be evident in the next five years. The use of the data in this report will be of benefit to those who will be reviewing the training packages in these industries.

The data in this report will also be of benefit to those developers of new standards who may be working with today's technology and not aware of the new technologies that are soon to be evident. A failure to consider these developing technologies may see the training packages and standards "age" more quickly than is necessary.

Four Major Themes

It is suggested that the following four themes be considered:

Information and Communications Technology

There is an undeniable move from closed, vendor-controlled information systems to systems that are open and based upon international standards. These systems are more closely aligned to traditional information technology computer networks than proprietary systems and use many basic protocols and processes. These moves also include an increase in the use of wireless communications and software utilisation rather than upgrades of equipment and hardware.

The OECD reports that:

“The movement of OECD countries towards a knowledge-based society is linked to the emergence of a more networked economy, which has helped to improve productivity, chiefly through the generation, diffusion and use of information. Information and Communication Technologies (ICTs) in particular played a key role in the increase in labour productivity in several OECD countries in the 1990s...through additional capital formation and the acceleration of multi-factor productivity growth.”¹

All members operating in these industries will need to engage in some types of training that is currently covered through the information and communications technology (ICT) based training packages. This training will need to include not just computer literacy but full-scale information technology training.

Anticipation of new technology

The need to learn about new technologies and anticipate their impact on the day-to-day processes in the workplace will eventuate if an individual recognises those additions to his or her skill and knowledge base are required. Many individuals are not concerned about what may happen within their workplace five years from now and it is the responsibility of management to ensure that the enterprise has anticipated the changes.

Trade magazines, industry associations and other interest groups provide this information but usually with the shorter time frames of around one or two years. The vocational and education training system needs to prepare for the introduction of new technologies in cycles greater than one year. The Centre for the Economics of Education and Training reported that

“[t]he early recognition of changes in the qualifications and skills required by industry can contribute to the productivity and competitiveness of the economy. Indicators of change are especially important where training is provided principally by public sector institutions that are to some extent insulated from market forces.”²

Reviews of training packages in these industries should not wait until the technologies become main-stream to include the appropriate standards or qualifications that address these emerging issues.

Professional Development

Many developers and vendors of emerging technology do not provide training to those individuals outside of the enterprise. Reasons for this “closed shop” approach may be that the vendor wishes to retain control over the management of the product for quality purposes or that the restriction of skilled technicians will boost the profitability of the installation process.

All of the technologies highlighted in this report are commercially available but have not traditionally been associated with the industries into which these technology now entering. Therefore training is available but the source of the training is not seen as being associated with the industry into which it is merging. Large training providers may have the necessary ability within the organisation to provide training but may need to develop intra-organisational links to manage this training.

Access to training

New technology is perceived as new only by those who are not familiar with the emerging technology. New entrants do not perceive a difference between the emerging technology or the existing technology as each will appear to be “new” to the new entrant.

It is for this reason that managers see new entrants who have the necessary “soft skills” as more valuable to the organisation as these entrants do not have to unlearn the existing work processes and knowledge bases. A recent report on future skill needs states that “future VET provision needs to address two distinct areas: ‘soft’ skill and underpinning technical understanding in areas of basic science.”³ Therefore it is the existing operatives who need the opportunity to be able to up-skill and remain employable within these industries.

Therefore in this rapidly changing technological environment that has no borders, businesses will choose appropriate technologies to meet their needs, however these will predicated on the following drivers:

- Global Trends
- Government Policy
- Economic and productivity returns
- Access to suitable labour
- Access to a responsive training infrastructure and delivery regime

Recommendations

While this project has been able to identify those technologies that are impacting upon the business processes of the industries involved, planning needs to be undertaken to enable Australia to meet these challenges. Therefore, a range of issues require further attention. These are:

1. How the training systems and related infrastructure respond in a timely and flexible manner and to identifying how businesses apply respective technologies within an Australian context.
2. How are we to ensure that skill sets residing across industries in common are acknowledged and responded to in an effective manner and to identify how the increasing breadth and range of cross discipline shared technology are managed in terms of industry leadership and advice to the training system.
3. Determining how rapid adoption of technologies are linked to national workforce planning strategies and processes, aimed at improving the quality of Australia's skills pool and the training system.
4. The development of a national strategy to give effect to the above three points.

¹ Organisation for Economic Cooperation and Development (2002). *OECD science, technology and industry outlook*, p. 1. Paris: Author. Available:

<http://www.itemb.se/science/PDF/STI-Outlook-Highl-e.pdf> Accessed: 23 May, 2003.

² Long, M., & Fischer, J. (2002). *Project 2000-3 leading edge enterprise: insights into employment and training practices*, p. 1. Melbourne: Centre for the Economics of Education and Training. Available: <http://www.education.monash.edu.au/centres/ceet/WP42.pdf> Accessed: 23 May, 2003.

³ Dumbrell, T., de Montfort, R., & Finnegan, W. (2002). *New skills in process manufacturing*, p. 21. Leabrook, SA: National Centre for Vocational Education Research.