



# Wanted: ERP Training, Skills, Job Satisfaction And a Career

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## ABSTRACT

*There has been a recent call in the Australian marketplace for information systems (IS) professionals to possess work skills that span many disciplines. A recent report (Deloitte et al, 1999) bemoaned a lack of business skills in IS professionals. Skyme and Earl (1990) mapped out the characteristics of the business worker and saw technical, business, organisational and personal skills as being important. Organisations are devolving in span of operations and downsizing in personnel levels. Technology is constantly changing and information systems professionals are being asked to cope with the need to develop differing skill sets. Against this scenario we sought the views of information systems professionals employed in SAP enterprises in the Australian and New Zealand marketplace about the training, career progression and skills mix that affected them. The main results of this survey showed that the ERP/SAP professionals occupy stable long-term positions but are looking to move into another organisation in just over one year. They favour a move into MySap.com or B2B fields and all have undergone extensive and effective SAP training. They are split when considering important factors in career progression citing training, technical skills and business skills as important.*

## ERP PEOPLE FACTORS

### ERP People

As in the global marketplace Australian enterprises have struggled with the large-scale change necessary in ERP. Weston Foods implemented one of the largest SAP installations in Australia in 1999 and their finance director Douglas Forgie (Bass, 1999) commented on the need to change organisational culture when implementing ERP. This point is supported by John Julian (Forsyth, 1999), director of Information Systems at Monash University, when they implemented a SAP back office HR/Finance system. He commented that any ERP implementation is more a people rather than a technical problem.

### ERP Implementations

The implementation of ERP software is a major issue facing businesses. The implementation of software is often complex and has a major impact on the business (Trunick, 1999). The complexity of ERP software implementation has resulted in projects becoming longer and more expensive and often not delivering the expected benefits (Bell 2000; Cameron et al, 1998). Trepper (1999) proposed that if a project team did not possess the required business, interpersonal and technical skills then the chances of project implementation success are negligible. Maxwell (1999) believed that part of the blame can be attributed to the complexity of SAP, but much of the blame lies squarely with change management and the confusion, resistance and redundancies that can be created. Added to this, is the problem that consulting firms can ignore the internal politics surrounding a SAP implementation. Few businesses are flexible enough to change their processes to suite to business models and achieve the implementation on time (Lucas, 2000; Davenport, 1998). ERP projects are particularly challenging and require careful planning of time and budget to avoid project disaster. This has resulted in businesses adopting alternative implementation methods (Ross, 1998). The purchase (Davenport, 1998) and implementation of an ERP application is just the beginning of a large investment in IT, and the projects are often different to other kinds of projects that the business have implemented.

## Information Skill Sets

In 2000 the U.S. Departments of Commerce, Labour and Education released the 21st Century Skills (Stuart, 1999) report which described a vision of the specific competencies that will be required by 21st century workers. These included the ability to understand complex systems including social, organisational and technological systems. Inherent in this report is the skills of the personnel that handle information within organisations. Broadbent et al (1992) and Opie (1994) found that the numbers of users actually utilising data and information are increasing, and proposed that the skills required by information managers included networking and project management on the technical side, and business redesign and quality management on the business side. The 21st Century Skills report (Stuart, 1999) identified basic, technical, organisational and company specific skills as being crucial for workers into the 21st Century. A report released a decade earlier (Scan, 1992) saw four organisational competencies as being crucial:

- monitoring organisational performance,
- correcting organisational performance,
- designing new organisational systems,
- Improving organisational systems.

The Scan report also classified eleven organisational information skills that can be grouped into business and technical sub-groupings (Scan, 1992). The complete list of organisational skills:

### Business Information Skills

- a) Understand the **strategic** nature of information.
- b) Have the ability to act as a **change agent** within the organisation.
- c) Take part in formal **planning** within the organisation.
- d) Be actively involved with **quality assurance** programs within the organisation.
- e) Be aware of **changing** organisational information processes.
- f) Have knowledge of the importance of **informal** information flows in the organisation.

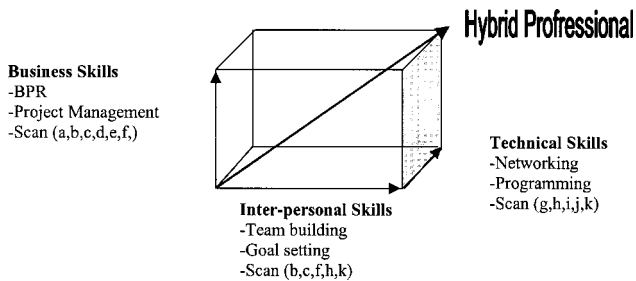
### Technical Information Skills

- g) Be conversant with **emerging** organisational information systems.
- h) Act as a **liaison** between information source and information user in the organisation.

- i) Understand the need for greater **integration** of information across the organisation.
- j) Be aware of the need for information **flows** across organisation boundaries.
- k) Be actively involved with information **users** from diverse areas of the organisation.

We propose a skills matrix based upon technical, business and the interpersonal skills that modern IS professionals require as a pathway to become the “Hybrid” IS professional. A mapping of the eleven organisation information skills onto the skills matrix is presented in Figure 1.

Figure 1. Matrix of IS Skill Mix with Scan skill sets for the Hybrid IS professional.



### E Business Careers

In the age of E-business will a new set of careers structures emerge? A crucial question for enterprises will be the management of their staff and their ability to keep “on deck” capable and motivated staff. The traditional ERP with an emphasis on transactional computing and back office systems has been well served by the information systems industry. The move to E Business will require all enterprises to manage the broader information chain within the E-business supply chain (Chung, 2000; Somers, 2000). Enterprises will need to decide if their workforce and or consultants will be able to take the next step into the E world. Training and education in technical, change-management, BPR and inter/intra department communication skills will be crucial for the success of large E-business projects. Just as a viable skills base is important for the organisation to succeed so to for the information systems professional. The IS professional may ask several questions; to follow consultancy versus full-time employment, to pursue degree versus certification education, undertake continuous versus JIT training? Training as an implementation issue is undergoing stress both from the rapidly developing content being delivered as well as advances in delivery technology.

### ERP A People Problem

There is very little documentation in reference to the training regimes, skills required and career planning within the implementation of ERP systems. The availability of historical data concerning ERP people factors could alleviate the problems of similar implementations in the future. This lack of historical data is even more critical when applied to Australian experiences. Even though there has been many ERP implementations in Australia very little data is available. The collection of such information could assist in project management of ERP system implementations and accordingly prevent some of the documented pitfalls that have plagued previous projects.

## METHODOLOGY

The primary objective of the study was to survey a range of ERP information system professionals and seek responses to issues including training regimes and career progression. SAP Australia was chosen as the study vector as it dominates (IDC, 1999) the ERP market in Australia. The first part of the study as presented in this paper will provide an analysis of SAP professionals including: career progression, training history & analysis and E-business career opportunities.

### Research Methodology

The best method for gathering data was determined to be a survey of those information systems professionals listed as working within the ERP marketplace. SAP Australia provided two customer data files. The first was the customer file, this contained client name, contact, implementation date and type. The second file contained name, go-live date and module information. The two files were combined into a database and cross-referenced with a Bloomberg datastore to include financial data pertinent to the enterprises. This datastore provided contact details of about 500 information systems professionals that have worked on SAP systems from 1995. The initial survey instrument was developed based on the fields that were identified in the literature and used email as the delivery platform. Several studies (Dillman, 1998; Comley, 1996; Mehta, 1995) have compared email versus mail information collection methods and have that email surveys compared favourably with postal methods in the areas of cost, speed, quality and response rate. The use of an email directing the respondent to a web site was also investigated but was thought to introduce an additional step in the sampling process. The survey form was piloted with a small (N=25) sample from SAP organisations. After minor refinements suggested by the pilot tests the final survey email was sent to the cohort with one follow-up reminder. It was necessary to preen the email address book to remove and amend email that had bounced back.

## RESULTS

### Survey Instrument

The survey instrument had 14 questions covering three areas, SAP issues, training history and career progression. Both open and closed questions were used along with Yes/No and five point Likert scale responses. Any response was cross-referenced with the original SAP master listing allowing organisational type data to be incorporated. SAP issues included time working on SAP, version and the extent by which ERP/SAP had helped career achievement. Training issues included number and type of training courses as well as Likert rating of effectiveness of course. Career issues included current and self-assessed future job longevity as well as potential career changes.

### Responses

The original email listing contained 455 potential respondents from 387 Australian and New Zealand organisations. It contained multiple email addresses from an organisation and was a historical listing containing information up to 4 years old. A number of emails were undeliverable due to members of the cohort moving positions, having incorrect email addresses, having changed email addresses or automatic out-of-office responses. The overall response rate once removing the undeliverable addresses was 31%. The response rate is presented in Table 1.

Table 1. Response Rate %

Issue	Number	Undeliverable	Answered	Rate
First e-survey	455	81	55	
Second e-survey	319	27	53	
Total	455	108	108	108/347=31%

**Demographics**

Responses were received from 108 SAP professionals and the data were analysed to present position, company type, company size and SAP version. Responses for the whole cohort are presented along with cross-tabulations based upon respondent position. The results are presented in Table 2.

Table 2. Demographic Breakdown of respondents (N=108)

Position	%	Org type	%	All %	Org Size Revenue	%	Vers	%
IS Managers	26	Public Admin	45	35	Large	83	3	37
IS Consultants	11	Retail/Whole	14	15	Med-Large	11	4	22
Business Managers	18	Mining	11	9	Medium	5	4.5	19
SAP Basis	14	Utility	4	5	Small	1	4.6	22
SAP Admin	11	Finances	4	2				
SAP Support/Tech	21	Manufacturing	15	18				
		IT Services	4	3				
IS Focussed	83	Transport	5	4				
Non IS Focussed	17	Comm Services	0	1				

**SAP Issues**

Respondents indicated the extent of work time spent on SAP systems by selecting a value from 1 to 5, with 1 representing 1-20% and a 5 representing 81-100% of work time. Table 3 shows the means and standard deviations of SAP work-time and the degree by which SAP has assisted career development arranged in order.

Table 3. SAP Work Time by Position (N=108)

Position	Work on SAP Mean (μ)	Sd (σ)	Position	SAP Career Help Mean (μ)	SD (σ)
Whole Cohort	3.75	1.45	Whole Cohort	4.02	.92
IS Focussed	3.42	1.40	IS Focussed	4.08	.92
Non IS Focussed	3.83	1.64	Non IS Focussed	3.74	.93
<b>Ordered</b>					
SAP Basis	4.07	1.22	IS Consultants	4.36	.67
SAP Administrators	4.00	1.26	IS Managers	4.19	.83
SAP Support/Tech	3.95	1.43	SAP Basis	4.13	1.06
IS Managers	3.63	1.36	SAP Administrators	4.09	.94
IS Consultants	3.55	1.86	SAP Support/Tech	3.77	1.02
Business Managers	3.42	1.64	Business Managers	3.74	.93

SAP Basis professionals reported heaviest usage of SAP systems and consultants reported the highest rating for career progression through knowledge of SAP. The very tight standard deviation shows good agreement among IS consultants. Business managers show lowest usage of SAP and lowest rating of career progression.

**Training Responses**

Respondents indicated the occurrence of SAP training with Yes/No option as well as the number of SAP courses undertaken by selecting a value from 1 to 4, with one representing 1 course, a four representing 4. Table 4 shows the percent undertaking SAP training as well as the mean and standard deviation for number of courses. In addition to level of SAP training respondents indicated the extent and rating of differing SAP training modes by selecting a value from 1 to 5, with one representing Poor and a five representing Very Good. Table 5 shows the means and standard deviations for training modes for the positions of cohorts. Respondents indicated other training modes in an open question and they include consultants, in-house training, on-line help and self-learning.

Table 4. SAP Training by Position (N=108)

Position	Done SAP Training %	Number of SAP Courses Mean (μ)	Sd (σ)
Whole Cohort	95	3.08	1.30
IS Focussed	97	3.24	1.18
Non IS Focussed	85	2.32	1.57
<b>Ordered</b>			
SAP Administrators	100	3.64	.92
SAP Basis	97	3.33	1.35
IS Consultants	100	3.18	1.33
IS Managers	97	3.15	1.26
SAP Support/Tech	100	3.14	1.04
Business Managers	85	2.32	1.57

All IS based professionals had undertaken SAP training with SAP administrators undertaking the highest number of courses. The low standard deviation for SAP administrators shows a good agreement. Business managers had completed an average of 2 courses. Offsite SAP training was very popular with all respondents with an overall good rating. ASAP and Delta training modes had been completed by only about 12 % of the cohort with low rating of effectiveness. SAP consultants and SAP support professionals report high satisfaction with the SAP classroom training.

Table 5. SAP Training Modes by Position (N=108)

Position	SAP Offsite Yes %	Rating Mean (μ)	Sd (σ)	ASAP CBT Yes %	Rating Mean (μ)	Sd (σ)	Delta CD Yes %	Rating Mean (μ)	Sd (σ)
Whole Cohort	90	3.61	1.01	13	3.08	.76	12	3.08	1.11
IS Focussed	94	3.36	1.34	13	*	*	12	*	*
Non IS Focussed	79	2.84	1.89	4	*	*	8	*	*
<b>Ordered</b>									
IS Consultants	91	3.64	1.43	18	*	*	18	*	*
SAP Support/Tech	100	3.64	1.22	22	*	*	8	*	*
SAP Basis	93	3.47	1.19	13	*	*	13	*	*
SAP Administrators	100	3.27	1.27	9	*	*	9	*	*
IS Managers	89	3.00	1.41	15	*	*	7	*	*
Business Managers	79	2.84	1.89	4	*	*	8	*	*

\* Not Statistically Significant

**Career Progression**

Respondents indicated the length of their current job as well as their proposed stay in their current job by selecting a value from 1 to 5, with one representing <6mths, two 6-12mths, three 12-18mths, four 18-24mths and five >24mths. Table 6 shows the percent desiring ERP related career moves and mean of current and proposed job longevity. Respondents indicated in an open question other career moves not relating to ERP fields and these include e-commerce, business analysts, web analysts and java developers. Table 6 shows the mean and standard deviation for positions of cohorts.

Table 6. SAP Job Stay and Career Moves by Position (N=108)

Position	Current Job Stay Mean (μ) Months	Future Job Stay Mean (μ) Months	MySap.com %	CRM %	B2B %	Supply Chain %
Whole Cohort	26	16	45	20	29	20
IS Focussed			49	22	30	22
Non IS Focussed			25	13	10	13
<b>Re-categorised</b>						
IS Managers	28	15	63	22	63	33
IS Consultants	30	21	63	36	27	9
Business Managers	27	14	26	16	11	16
SAP Basis	21	14	40	13	20	6
SAP Administrators	41	18	27	9	36	18
SAP Support/Tech	16	21	41	23	27	23

Consultants and SAP support professionals plan to stay about two years in their current positions with all other professionals planning a fourteen months stay. IS Managers reported heavy interest in the MySap.com and B2B fields with consultants interested in MySap.com fields.

Table 7. General Career Movements by Position (N=108)

Position	Same Position Same Org. %	Same Position Diff Org. %	Same Position Overseas Org. %	Different Position Same Org. %	Different Position Diff Org. %	Different Position Overseas Org. %
Whole Cohort	19	39	23	16	36	19
IS Focussed	20	41	23	21	42	26
Non IS Focussed	16	32	26	21	42	26
<b>Re-categorised</b>						
IS Managers	18	44	11	22	41	22
IS Consultants	36	36	18	18	27	18
Business Managers	16	32	26	21	42	26
SAP Basis	13	53	41	13	47	27
SAP Administrators	9	45	36	0	18	9
SAP Support/Tech	23	27	18	14	31	9

Several trends are evident in general career movements. Moves to different organisations over current organisations are popular with the entire cohort. IS managers and SAP Basis favoured moving to a similar position in a different organisation. This indicated a degree of flexibility in their transferable job skills. SAP Basis professionals are looking at moving overseas either in a similar or different position. SAP administrators do not favour a move to different positions in the same, different or overseas organisations. This may indicate that these professionals are not looking to move or are unable to transfer into related job areas.

## DISCUSSION

### Career Progression

The cohort was essentially a stable body of professionals who saw a change in position taking place in about one year. That new position was going to be in the same field but probably in a different organisation. If new fields were being considered it probably would be MySap.com or a B2B position. SAP had been a boon for the cohort with high levels of agreement that SAP had been a great help. IS managers and SAP specialists (Basis, Support & Administrators) all reported high levels of agreement that SAP had been a boon but were all looking at changing position sooner rather than later. This trend should be studied in light of the reported (Deloitte et al, 1999) shortage of 31000 IT workers in 2000 growing to 180000 in the year 2004 in the Australian marketplace. Open-ended questions showed that E-business career moves were being considered. Some of the proposed fields included e-commerce, business analysts, web analysts and java developers.

### Training Options

Moves by SAP with their Virtual Classroom highlight the use of the WEB for content delivery in training. The entire cohort had undertaken training in SAP related topics. Offsite SAP classroom training was very popular whilst CBT options including ASAP and Delta were not extensively used. Open-ended questions showed that respondents felt that books, manuals, on-line help and the use of consultants all proved viable training options. The acceptance of instructor centric training will prove a challenge for designers of Web or virtual training modes. Another issue important is the acceptance of organisations to adopt training to "skill up" the work force. The recent IT&T report (Deloitte, 1999) predicted that Australian will rely upon recruitment or poaching of skilled professional rather than developing in-house trained professional. The report indicates that this will lead to increased "churning" and an escalation of the price of IS professionals. Reports from the US (Stuart, 1999) and the European Commission (European Council, 1998) all point to the need to improve and expedite training of IS professionals to pave the way into the emerging E-Business marketplace.

## E Business Careers

One open-ended question simply asked the respondents what was the most important issue concerning their career development. The responses can be grouped into three areas, lifestyle, technical and business areas. 25% of the respondents reported that job satisfaction and a balanced work and life was paramount in career progression. Other respondents were more pragmatic with 15% reporting training and 14% reporting updating technical skills as crucial. The business responses ranged across a number of areas.

- Accept risk and travel
- Changing company direction re SAP
- Employee opportunities
- Good contacts within industry
- Influence direction of organisation
- Knowing best practise for ERP projects
- Management Training
- Move from functional into general management
- Opportunities within firm
- Picking correct company
- Right place Right time
- Leadership Skills

Only one respondent reported tertiary qualifications as being crucial. Several important issues are raised by this research. Does the reality of the IS career progression match the reported looming IT skills shortage? Will virtual training be able to supply what IS professionals want? How will the technical, inter-personal and business skills of IS professionals change into the E-business age? Additional research is proposed to further clarify these issues.

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