



BUSINESS USE OF INFORMATION TECHNOLOGY

AUSTRALIA

EMBARGO: 11:30AM (CANBERRA TIME) TUE 5 OCT 1999

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- For further information about these and related statistics, contact Annette Scott on Melbourne 03 9615 7977, or Client Services in any ABS office as shown on the back cover of this publication.

NOTES

INTRODUCTION

This publication presents results, in respect of the 1997–98 financial year, from an Australian Bureau of Statistics (ABS) survey on the use of information technology and telecommunications (IT&T) by employing businesses. This is the second ABS survey of IT&T use by business with the previous collection being conducted in respect of the 1993–94 financial year. The 1993–94 survey mainly focused on issues related to computer use, while the 1997–98 survey has collected a broader range of data with particular emphasis on Internet use by business. For details on the most recent issue of other ABS publications on the use and production of IT&T goods and services in Australia, see paragraph 15 of the Explanatory Notes.

This publication updates and expands the preliminary results released in April this year in *Business Use of Information Technology, Australia, Preliminary, 1997–98* (Cat. no. 8133.0).

IT&T

IT&T in this publication refers to the services and technologies that enable information to be accessed, stored, processed, transformed, manipulated and disseminated, including the transmission or communication of voice and/or data, over a variety of transmission media. Transmission media include telephone, facsimile, Internet, data lines, satellite, microwave, radio, etc.

COMMENTS ON THIS PUBLICATION

The ABS welcomes comments and suggestions from users regarding data items for inclusion in future surveys. Comments should be addressed to the Director, Science and Technology Statistics Section, Australian Bureau of Statistics, PO Box 10, Belconnen, ACT, 2616.

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MAIN FEATURES

At the end of June 1998, an estimated 63% of all employing businesses in Australia used PCs. This has increased since the end of June 1994 when 49% of employing businesses used PCs.

Of the businesses with PCs at the end of June 1998, almost half had access to the Internet (29% of all businesses) and nearly a third had local or wide area networks (20% of all businesses). A web site/home page was reported by 6% of all businesses.

Electronic Funds Transfer Point of Sale (EFTPOS) facilities were offered to clients by 15% of employing businesses. A small number of businesses used barcoding/scanning systems (6%), interactive voice response (2%) or video conferencing/teleconferencing (3%).

Of the businesses without PCs at the end of June 1998, 11% intended to use them within the next 12 months. Businesses intending to acquire Internet access within the next 12 months comprised 19% of businesses without Internet at the end of June 1998, and businesses intending to establish a web site/home page within the next 12 months comprised 16% of businesses without a web site/home page at the end of June 1998.

Almost two-thirds of businesses without PCs at the end of June 1998 reported that they did not have PCs because the technology was 'not suited to the nature of the business'. One-third of businesses without PCs reported 'costs' as a barrier to adopting PCs. Of businesses with PCs but no Internet access, 60% did not have the Internet because it was 'not suited to the nature of the business'. Nearly a third cited 'costs' as a barrier to acquiring Internet access.

Email was used by 92% of businesses with access to the Internet. Other uses of the Internet included marketing and promotional activities (23%), placing purchase orders (16%) and receiving sales orders (10%). Payments were made via the Internet by 8% of businesses with Internet access and payments were received by approximately 2% of businesses with Internet access. Better access to information/services was named as a benefit of the Internet by 86% of businesses with Internet access.

At 30 June 1998, there were 2.5 million employed persons who used PCs at work, 34% of whom had access to the Internet. Employed persons with access to PCs comprised 40% of total employment. There were 123,000 persons employed providing in-house information technology and telecommunications (IT&T) support, comprising approximately 2% of total employment. On average, there were 22 PC users for every IT&T support employee/contractor.

Total expenditure on IT&T by employing businesses in 1997-98 was \$23,580m, of which \$3,940m (17%) was wages and salaries of in-house IT&T employees. On average the total IT&T expenses per PC user was \$9,300.

SECTION 1

BUSINESS USE OF INFORMATION TECHNOLOGY

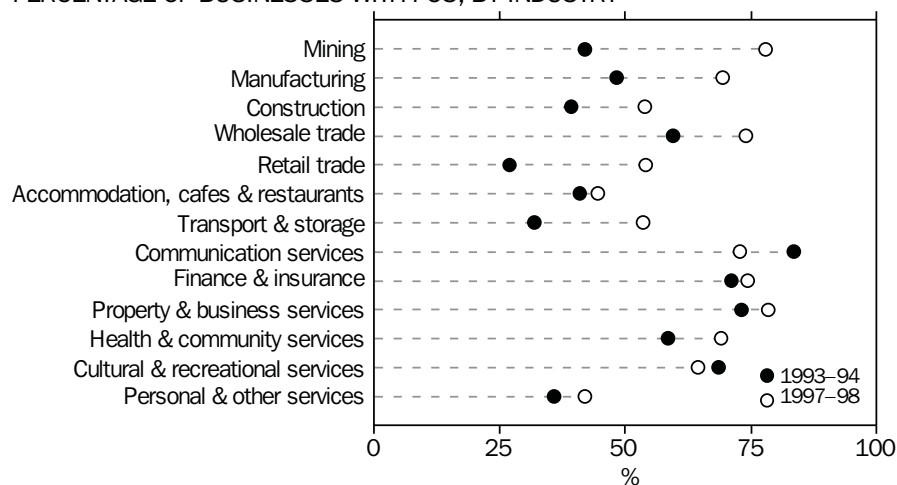
PERSONAL COMPUTERS (PCs) AND INTERNET ACCESS

Industry While 63% of employing businesses used PCs, the highest usage occurred in the Property and business services industry (78%) and the Mining industry (78%). The Mining industry also experienced the largest growth in PC use with the proportion of businesses using PCs increasing by 36 percentage points since June 1994. Retail Trade also experienced a large increase in the proportion of businesses using PCs, increasing from 27% to 54% over the four years to June 1998.

While the number of businesses with computers in the Communication services industry has more than doubled over the four years to June 1998, the overall PC usage was 73% at the end of June 1998, a decrease from 83% in June 1994. This has resulted from a disproportionate growth in the Courier and Postal services industries which have a lower PC usage than the Telecommunications industry. The latter reported 100% PC usage.

The lowest usage of computers by business occurred in the Personal and other services industry (42%) and the Accommodation, cafes and restaurants industry (45%). However, PC usage in these industries has increased since June 1994 when 36% and 41% respectively of employing businesses had PCs.

PERCENTAGE OF BUSINESSES WITH PCS, BY INDUSTRY



Industry continued Access to the Internet at the end of June 1998 was highest in Mining (46%), Communication services (45%), and Property and business services (44%). In contrast, industries such as Accommodation, cafes and restaurants (14%), Retail trade and Construction (both with 17%) and Transport and storage and Personal and other services (both with 20%) had the lowest proportion of Internet access.

While 29% of businesses had access to the Internet, only 6% of businesses had a web site/home page. The highest incidence of web site/home page occurred in Mining (19%), Cultural and recreational services and Communication services (both with 13%) and Finance and insurance (12%) industries.

Agriculture Agricultural businesses were not within scope of the 1997-98 Business Technology Survey and are therefore not included in any totals. However, information on the use of information technology and telecommunications (IT&T) by farms was collected in the 1997-98 Agriculture Commodity Survey, results of which are contained in a data report *Use of Information Technology on Farms, Australia* (Product no. 8150.0.40.001). This report indicates that of the 145,000 farms in Australia at March 1998, an estimated 40% had a computer and 11% had Internet access.

1.1 BUSINESS USE OF PCs AND THE INTERNET, BY INDUSTRY

	PCs	LAN/ WAN	Internet access	Email access	Web browser access	Web site/ home page	Number of businesses
	%	%	%	%	%	%	'000
Mining	78	38	46	45	43	19	2
Manufacturing	69	21	31	29	25	8	48
Electricity, gas & water supply(a)	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Construction	54	7	17	16	15	*4	78
Wholesale trade	74	30	38	38	35	10	43
Retail trade	54	17	17	17	14	*2	110
Accommodation, cafes & restaurants	45	8	14	12	13	*5	31
Transport & storage	54	15	20	19	15	5	31
Communication services(b)	73	*17	45	45	*38	*13	3
Finance & insurance	74	27	39	37	34	*12	18
Property & business services	78	30	44	43	39	8	142
Health & community services	69	20	33	32	30	*5	49
Cultural & recreational services	64	18	33	33	30	13	15
Personal & other services	42	12	20	20	18	9	33
Total	63	20	29	28	25	6	603

(a) Not available separately but included in totals (see paragraph 4 of Explanatory Notes).

(b) Includes telecommunication services and postal and courier services.

Business size The proportion of businesses using PCs at the end of June 1998 increased with the size of the business. Nearly all businesses employing 100 or more persons used PCs (99.7%) and of these, 86% were connected to either a Local Area Network (LAN) or Wide Area Network (WAN). In contrast, only 55% of businesses employing 1–4 persons used PCs, with a fifth of these businesses being connected to a LAN or WAN (11%).

Larger businesses were more likely to have Internet access and email and/or web browser access. Of those businesses employing 100 or more persons, 87% had access to the Internet. This compares with 24% of businesses employing 1–4 persons, 32% of businesses employing 5–19 persons and 56% of businesses employing 20–99 persons.

The proportion of businesses with a web site/home page varied markedly with the size of the business, with 58% of businesses employing 100 or more persons having a web site compared to 4% of businesses employing 1–4 persons.

The overall growth in the proportion of businesses using computers since June 1994 is mainly due to growth in the proportion of smaller employing businesses with PCs. At the end of June 1994, 46% of businesses employing 1–19 persons had a PC compared with 61% of businesses in June 1998.

1.2 BUSINESS USE OF PCs AND THE INTERNET, BY EMPLOYMENT SIZE

	PCs	LAN/ WAN	Internet access	Email access	Web browser access	Web site/ home page	Number of businesses
	%	%	%	%	%	%	'000
1–4 persons	55	11	24	23	21	4	390
5–19 persons	75	32	32	31	28	8	171
20–99 persons	91	50	56	54	49	21	37
100 or more persons	100	86	87	85	83	58	5
Total	63	20	29	28	25	6	603

1.3 BUSINESS USE OF PCS AND THE INTERNET, BY INCOME RANGE

	PCs	LAN/ WAN	Internet access	Email access	Web browser access	Web site/ home page	Number of businesses
	%	%	%	%	%	%	'000
Less than \$50 000	39	*7	15	13	13	*2	72.5
\$50 000–\$199 999	56	11	26	25	22	4	233.1
\$200 000–\$499 999	69	20	25	24	22	*4	143.1
\$500 000–\$999 999	71	26	31	30	28	9	64.1
\$1m–\$49m	88	47	50	49	44	18	87.2
\$50m–\$499m	100	94	86	84	83	55	2.8
\$500m or more	100	100	97	97	94	85	0.2
Total	63	20	29	28	25	6	603.0

OTHER TECHNOLOGIES

At the end of June 1998, 15% (92,000) of employing businesses offered Electronic Funds Transfer Point of Sale (EFTPOS) facilities to clients. A large number of these businesses (77%) were in the Retail trade (44,000 businesses), Accommodation, cafes and restaurants (13,000), Health and community services (8,000) and Wholesale trade (6,000) industries. The use of this technology varied with the size of the business with 9% of businesses employing 1–4 persons offering EFTPOS compared with 32% of businesses employing 100 or more persons.

There was a higher incidence of the use of EFTPOS than other technologies, with only 6% of businesses using barcoding/scanning systems, 3% using video conferencing/teleconferencing and 2% using interactive voice response.

1.4 OTHER TECHNOLOGIES USED, BY EMPLOYMENT SIZE

	<i>Barcoding/scanning systems</i>	<i>Interactive voice response</i>	<i>Video conferencing/teleconferencing</i>	<i>EFTPOS</i>
	%	%	%	%
1–4 persons	3	*2	*1	9
5–19 persons	10	*2	3	25
20–99 persons	11	**3	*9	27
100 or more persons	47	7	24	32
Total	6	2	3	15

INTENTIONS TO ACQUIRE INTERNET ACCESS

The number of businesses intending to acquire the Internet in 1998–99 was greater than the number intending to adopt PCs in the same period. Of the 220,000 employing businesses without PCs at the end of June 1998, 11% (24,000) intended to adopt this technology in 1998–99. This compares with 19% (83,000) of the 429,000 businesses without access to the Internet which intended to acquire it in 1998–99. The number of businesses intending to establish a web site/home page in 1998–99 was 16% (88,000) of the 564,000 businesses without a web site/home page at the end of June 1998.

1.5 INTENTIONS TO ADOPT SELECTED TECHNOLOGIES, BY EMPLOYMENT SIZE

	<i>Employment size</i>					<i>Number of businesses without selected technologies</i>
	<i>1–4 persons</i>	<i>5–19 persons</i>	<i>20–99 persons</i>	<i>100 or more persons</i>	<i>Total</i>	
	%	%	%	%	%	'000
Without PCs at 30 June 1998 which intend to use them within 12 months	10	16	*14	n.p.	11	220
Without Internet access at 30 June 1998 which intend to acquire it within 12 months	15	27	34	51	19	429
Without a web site/home page at 30 June 1998 which intend to establish one within 12 months	13	19	37	60	16	564
Without a LAN/WAN at 30 June 1998 which intend to adopt one within 12 months	6	9	*14	40	7	483

BARRIERS TO PC USE

Of the 220,000 businesses without PCs, 63% reported that PCs were 'not suited to the nature of the business'. Other barriers to using PCs were 'costs' (identified by 32% of businesses) and a 'lack of skills or appropriate training' (identified by 28%).

'Lack of skills or appropriate training' and 'costs' were identified as barriers to using PCs by a higher proportion of small businesses than larger businesses. Of those businesses without PCs, 29% of businesses employing 1-4 persons identified a 'lack of skills or appropriate training' and 34% identified 'costs' as barriers to using PCs. This compares with 6% and 20% respectively of businesses employing more than 20 persons.

1.6 BUSINESSES WITHOUT PCs AT 30 JUNE 1998: BARRIERS TO HAVING PCs, BY EMPLOYMENT SIZE

	<i>Not suited to nature of business</i>	<i>Costs</i>	<i>Lack of skills or appropriate training</i>	<i>Other(a)</i>	<i>Number of businesses without PCs</i>
	%	%	%	%	'000
1-4 persons	63	34	29	11	174
5-19 persons	65	28	25	14	44
20 or more persons	68	*20	**6	*23	3
Total	63	32	28	12	220

(a) Includes technical difficulties, security concerns, or other concerns.

SECTION 2

BUSINESS USE OF THE INTERNET

PERIOD IN WHICH INTERNET ACCESS GAINED

Just over half of businesses with access to the Internet at June 1998 had gained access before July 1997. About 16% of all businesses had gained access prior to July 1997, and another 13% gained access during 1997-98. A further 14% of businesses were intending to gain access to the Internet during 1998-99, lifting the expected rate of access to the Internet to 43% of employing businesses by June 1999. Based on intentions reported at June 1998, it is estimated that at June 1999, 94% of businesses employing 100 or more persons would have had access to the Internet, compared to 71% of businesses employing 20-99 persons, 50% of businesses employing 5-19 persons and 36% of businesses employing 1-4 persons.

2.1 PERIOD IN WHICH INTERNET ACCESS FIRST GAINED, BY EMPLOYMENT SIZE

	<i>First gained access prior to 1 July 1997</i>	<i>First gained access from 1 July 1997 to 30 June 1998</i>	<i>Intend to gain access between 1 July 1998 and 30 June 1999</i>
	%	%	%
1-4 persons	13	11	12
5-19 persons	18	14	18
20-99 persons	32	24	15
100 persons or more	36	51	7
Total	16	13	14

USE OF INTERNET

- Email** Most employing businesses with access to the Internet at the end of June 1998 used the Internet for email (92%). The proportion of businesses using the Internet for email did not vary greatly with the size of the business.
- Sales of goods and services over the Internet** Of the 174,000 employing businesses with access to the Internet at the end of June 1998, 16% used the technology to place purchase orders and 10% to receive sales orders. Invoices were sent via the Internet by 7% of businesses with access to the Internet, and were received by 8% of businesses. While 8% of businesses with access to the Internet made payments over the Internet, only 2% of such businesses received payments over the Internet.
- Other uses of the Internet** Marketing and promotional activities on the Internet were carried out by 23% of businesses with Internet access. This was more prevalent in businesses with Internet access employing more than 100 persons, where 44% carried out marketing and promotional activities, as compared with 16% of businesses employing 1–4 persons.
- Other uses of the Internet included coordinating delivery arrangements (9% of businesses with Internet access) and lodging government forms or tenders (7%).

2.2 BUSINESSES WITH INTERNET ACCESS AT 30 JUNE 1998: USE OF THE INTERNET FOR SELECTED BUSINESS ACTIVITIES, BY EMPLOYMENT SIZE

	<i>Employment size</i>				<i>Total</i>
	<i>1–4 persons</i>	<i>5–19 persons</i>	<i>20–99 persons</i>	<i>100 or more persons</i>	
Marketing and promotional activities (%)	16	26	41	44	23
Placing purchase orders (%)	16	18	15	17	16
Receiving sales orders (%)	8	10	*17	10	10
Sending invoices (%)	9	*5	*1	*3	7
Receiving invoices (%)	*8	9	*4	4	8
Making payments (%)	*8	9	*7	5	8
Receiving payments (%)	*1	*3	*1	*2	*2
Coordinating delivery arrangements (%)	*7	13	10	9	9
Lodging government forms/tenders (%)	*4	9	*10	16	7
Email (%)	90	94	93	94	92
Other transactions (%)	16	12	*12	17	14
Number of businesses with Internet access ('000)	94	54	21	5	174

BENEFITS OF INTERNET

Of those businesses with access to the Internet, a large proportion (86%) identified 'better access to information/services' as a benefit of the Internet. A lower proportion of businesses identified benefits such as 'broader client exposure' (27%), 'reduced business costs' (27%) and 'improved customer satisfaction' (23%). A similar proportion of businesses identified that the Internet 'facilitates doing business across time zones' (30%). There were 5% of businesses with access to the Internet at the end of June 1998 which identified that there were 'no benefits' to Internet use.

2.3 BUSINESSES WITH INTERNET ACCESS AT 30 JUNE 1998: BENEFITS OF INTERNET USE, BY INDUSTRY

	<i>Reduced business costs</i>	<i>Broader client exposure</i>	<i>Better access to information/ services</i>	<i>Facilitates doing business across time zones</i>	<i>Improved customer satisfaction</i>	<i>Number of businesses with Internet access</i>
	%	%	%	%	%	'000
Mining	31	27	92	43	*12	1
Manufacturing	*22	30	71	27	*21	15
Electricity, gas & water supply(a)	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Construction	*15	*17	84	*17	*8	14
Wholesale trade	35	33	88	43	21	17
Retail trade	*23	*14	84	*15	*16	19
Accommodation, cafes & restaurants	*12	41	78	*15	*24	4
Transport & storage	46	42	88	45	*23	6
Communication services(b)	*40	*41	83	*9	**23	*1
Finance & insurance	*14	*40	92	53	*23	7
Property & business services	33	29	90	36	34	63
Health & community services	22	*15	88	*16	*13	16
Cultural & recreational services	*21	35	84	31	*14	5
Personal & other services	24	22	87	*18	*16	7
Total	27	27	86	30	23	174

(a) Not available separately but included in totals (see paragraph 4 of Explanatory Notes).

(b) Includes telecommunications services and postal and courier services.

2.4 BUSINESSES WITH INTERNET ACCESS AT 30 JUNE 1998: BENEFITS OF INTERNET USE, BY EMPLOYMENT SIZE

	<i>Reduced business costs</i>	<i>Broader client exposure</i>	<i>Better access to information/ services</i>	<i>Facilitates doing business across time zones</i>	<i>Improved customer satisfaction</i>	<i>Number of businesses with Internet access</i>
	%	%	%	%	%	'000
1-4 persons	28	23	86	30	23	94
5-19 persons	27	26	86	29	24	54
20-99 persons	26	42	85	31	21	21
100 or more persons	35	43	93	35	29	5
Total	27	27	86	30	23	174

LIMITATIONS TO GREATER INTERNET USE

While 30% of businesses with access to the Internet identified 'no limitations' to their use of the Internet, this varied by business size. Over one-third (36%) of businesses employing 1–4 persons which had Internet identified 'no limitations', while only 17% of large businesses (100 or more persons) identified 'no limitations'.

'Security concerns' was the factor most commonly identified by business which limited their use of the Internet. The proportion of businesses which saw 'security concerns' as a limitation also varied with business size. While 24% of those businesses employing 1–4 persons with Internet access identified 'security concerns' as a limitation, the proportion for businesses employing 100 or more persons was much higher at 54%.

Other factors which limit business use of the Internet included 'lack of skills or appropriate training' (25%), 'costs' (25%) and 'technical difficulties' (17%).

2.5 BUSINESSES WITH INTERNET ACCESS AT 30 JUNE 1998: FACTORS WHICH LIMIT GREATER USE OF THE INTERNET, BY EMPLOYMENT SIZE

	<i>Not suited to nature of business</i>	<i>Technical difficulties(a)</i>	<i>Costs</i>	<i>Lack of skills or appropriate training</i>	<i>Security concerns</i>	<i>No limitations</i>	<i>Number of businesses with Internet access</i>
	%	%	%	%	%	%	'000
1–4 persons	14	15	24	20	24	36	94
5–19 persons	25	20	25	29	29	24	54
20–99 persons	14	*14	26	38	40	21	21
100 or more persons	16	39	33	27	54	17	5
Total	18	17	25	25	28	30	174

(a) Includes bandwidth and other technical difficulties.

BARRIERS TO ACQUIRING INTERNET

Of the 209,000 businesses with PCs but no Internet access, 60% identified that the Internet was 'not suited to the nature of the business'. Across industries this varied between 48% for Property and business services to 74% for Retail trade. The proportion of businesses where the Internet was 'not suited to the nature of the business' also varied with the size of the business, with 34% of large businesses (100 or more persons) and 57% of small businesses (1-4 persons) identifying this as a barrier.

A smaller number of businesses identified 'costs' (30%) and 'lack of skills or appropriate training' (24%) as barriers to acquiring Internet access. Of those businesses with PCs but no Internet access, 45% of large businesses (100 or more persons) identified 'cost' as a barrier compared with 32% of businesses employing 1-4 persons. This proportion also varied across industries where 42% of businesses in Cultural and recreational services identified 'costs' as a barrier, compared with 21% of businesses in the Manufacturing industry.

'Other' barriers to acquiring the Internet were identified by 26% of businesses and this included 'security concerns' and 'technical difficulties'.

2.6 BUSINESSES WITH PCs BUT WITHOUT INTERNET ACCESS AT 30 JUNE 1998: BARRIERS TO ACQUIRING INTERNET ACCESS, BY INDUSTRY

	<i>Not suited to nature of business</i>	<i>Costs</i>	<i>Lack of skills or appropriate training</i>	<i>Other(a)</i>	<i>Businesses with PCs but no Internet access, as a percentage of all businesses with PCs</i>	<i>Number of businesses with PCs but no Internet access</i>
	%	%	%	%	%	'000
Mining	58	26	*20	25	41	1
Manufacturing	66	21	*17	25	56	19
Electricity, gas & water supply(b)	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Construction	63	25	22	20	68	29
Wholesale trade	59	26	26	30	48	15
Retail trade	74	37	28	19	69	41
Accommodation, cafes & restaurants	60	34	28	27	68	9
Transport & storage	49	36	31	21	63	10
Communication services(c)	*51	n.p.	n.p.	n.p.	*38	1
Finance & insurance	62	**17	*28	*25	48	6
Property & business services	48	27	19	34	44	48
Health & community services	56	36	26	32	52	18
Cultural & recreational services	54	42	*13	34	49	5
Personal & other services	72	34	33	*9	51	7
Total	60	30	24	26	55	209

(a) Includes technical difficulties, security concerns, or other concerns.

(b) Not available separately but included in totals (see paragraph 4 of Explanatory Notes).

(c) Includes telecommunication services and postal and courier services.

2.7 BUSINESSES WITH PCs BUT WITHOUT INTERNET ACCESS AT 30 JUNE 1998: BARRIERS TO ACQUIRING INTERNET ACCESS, BY EMPLOYMENT SIZE

	<i>Not suited to nature of business</i>	<i>Costs</i>	<i>Lack of skills or appropriate training</i>	<i>Other(a)</i>	<i>Businesses with PCs but no Internet access, as a percentage of all businesses with PCs</i>	<i>Number of businesses with PCs but no Internet access</i>
	%	%	%	%	%	'000
1-4 persons	57	32	24	26	56	122
5-19 persons	67	27	22	25	57	73
20-99 persons	54	28	*27	32	39	13
100 or more persons	34	45	*31	54	13	1
Total	60	30	24	26	55	209

(a) Includes technical difficulties, security concerns, or other concerns.

WEB SITE MAINTENANCE

Of the 39,000 businesses with a web site/home page at the end of June 1998, 40% were maintained internally by their organisation while 35% were maintained by an external organisation. A smaller proportion (25%) were maintained using both internal and external support.

Smaller businesses were more likely to maintain their own web site/home page than larger businesses with 46% of small businesses (1-4 persons) and 36% of large businesses (100 or more persons) maintaining their own web site/home page.

2.8 ARRANGEMENTS FOR MAINTAINING WEB SITE/HOME PAGE, BY EMPLOYMENT SIZE

	<i>Maintained internally to this organisation</i>	<i>Maintained by an external organisation or individual</i>	<i>Maintained both internally and externally to this organisation</i>	<i>Number of businesses with a web site/home page</i>
	%	%	%	'000
1-4 persons	46	30	*24	14
5-19 persons	36	38	*26	14
20-99 persons	39	42	19	8
100 or more persons	36	27	37	3
Total	40	35	25	39

SECTION 3

STAFF USE OF INFORMATION TECHNOLOGY

At the end of June 1998, 40% of persons working in employing businesses had authorised access to PCs and there were approximately three PCs for every 10 persons employed. The ratio of PCs to PC users was less than one (eight PCs for every 10 PC users).

Of those staff using PCs, 34% also used the Internet, comprising 14% of persons employed at the end of June 1998.

INDUSTRY

Staff use of computers was highest in the Electricity, gas and water supply industry (81%), the Finance and insurance industry (80%), and the Communication services industry (71%). In all three industries there was close to one PC for every PC user. In contrast, in the Accommodation, cafes and restaurants industry, 17% of persons employed used PCs and there were on average, six PCs for every 10 PC users.

Use of the Internet also varied across industries. Staff use of the Internet was highest in Property and business services where 29% of persons employed were Internet users. Internet users made up over half (55%) of all PC users in the industry. In contrast, 22% of persons employed in the Finance and Insurance industry used the Internet but Internet users were only 28% of all PC users in the industry.

3.1 TECHNOLOGY USER RATIOS, BY INDUSTRY

	PCs	PC users	Internet users	PCs per PC user	Internet users/PC users	PCs/total employment	PC users/total employment	Internet users/total employment
	'000	'000	'000	no.	%	no.	%	%
Mining	33	37	17	0.90	45	0.41	46	21
Manufacturing	288	353	106	0.82	30	0.29	36	11
Electricity, gas & water supply	38	37	9	1.03	26	0.83	81	21
Construction	121	144	38	0.84	27	0.28	33	9
Wholesale trade	208	249	96	0.84	38	0.44	53	20
Retail trade	198	326	58	0.61	18	0.17	27	5
Accommodation, cafes & restaurants	44	77	13	0.57	17	0.10	17	3
Transport & storage	105	125	34	0.84	27	0.29	35	9
Communication services(a)	97	91	14	1.07	15	0.76	71	11
Finance & insurance	262	259	72	1.01	28	0.81	80	22
Property & business services	473	520	286	0.91	55	0.48	53	29
Health & community services	117	187	69	0.63	37	0.23	37	14
Cultural & recreational services	46	61	21	0.76	34	0.25	33	11
Personal & other services	59	70	26	0.84	37	0.33	39	14
Total	2 090	2 536	858	0.82	34	0.33	40	14

(a) Includes telecommunication services and postal and courier services.

BUSINESS SIZE

The highest incidence of staff use of PCs occurred in businesses employing 1–4 persons, where 48% of persons employed used PCs, although there were, on average, eight PCs per 10 PC users for these businesses.

The proportion of staff using the Internet was lower in larger businesses. Only 12% of persons employed in large businesses (100 or more persons) used the Internet while 20% of persons employed in small businesses (1–4 persons) used the Internet.

While 13% of persons employed in businesses employing 20–99 persons used the Internet, these users represented 41% of all PC users in this category. In contrast Internet users were only 29% of all PC users in businesses employing 100 or more persons.

3.2 TECHNOLOGY USER RATIOS, BY EMPLOYMENT SIZE

	<i>PCs</i>	<i>PC users</i>	<i>Internet users</i>	<i>PCs per PC user</i>	<i>Internet users/PC users</i>	<i>PCs/total employment</i>	<i>PC users/total employment</i>	<i>Internet users/total employment</i>
	<i>'000</i>	<i>'000</i>	<i>'000</i>	<i>no.</i>	<i>%</i>	<i>no.</i>	<i>%</i>	<i>%</i>
1–4 persons	342	426	175	0.80	41	0.39	48	20
5–19 persons	463	624	206	0.74	33	0.32	43	14
20–99 persons	336	414	169	0.81	41	0.25	31	13
100 or more persons	948	1 072	307	0.88	29	0.36	40	12
Total	2 090	2 536	858	0.82	34	0.33	40	14

SECTION 4

INFORMATION TECHNOLOGY EMPLOYMENT

Employees providing in-house or external information technology and telecommunications (IT&T) services accounted for only 2% of total employment of employing businesses at the end of June 1998.

INDUSTRY

The industries with the highest proportion of employees providing IT&T services to either internal or external businesses were Communication services, Property and business services and Finance and insurance (all of which reported 5% of total employment).

There was a high level of support for PC users in the Communication services industry where there was an IT&T employee/contractor for every 10 PC users. In contrast, the lowest level of support was in the Construction and Retail trade industries where the numbers of PC users per IT&T employee/contractor were 64 and 61 respectively.

4.1 TECHNOLOGY EMPLOYMENT RATIOS, BY INDUSTRY

	<i>IT&T employees</i>	<i>IT&T employees/total employment</i>	<i>PC users per in-house IT&T employee</i>	<i>PC users per in-house IT&T employee/contractor</i>
	'000	%	no.	no.
Mining	1	1.1	42	23
Manufacturing	12	1.2	32	23
Electricity, gas & water supply	2	3.5	24	14
Construction	*2	*0.4	*84	*64
Wholesale trade	19	4.0	22	17
Retail trade	*8	*0.6	95	61
Accommodation, cafes & restaurants	*3	*0.6	*28	*24
Transport & storage	4	1.1	34	22
Communication services(a)	6	4.9	18	10
Finance & insurance	15	4.6	18	12
Property & business services	46	4.7	29	21
Health & community services	3	0.6	69	40
Cultural & recreational services	2	1.1	29	16
Personal & other services	*1	*0.8	*53	*31
Total	123	2.0	32	22

(a) Includes telecommunication services and postal and courier services.

BUSINESS SIZE

The proportion of IT&T employees to total employment did not vary greatly with the size of the business, ranging from 1.5% for businesses employing 20–99 persons, to 2.4% for businesses employing 100 or more persons.

Fewer IT&T employees/contractors supported PC users in smaller businesses than in larger businesses. The number of PC users to IT&T employee/contractors was 32 in businesses employing 1–4 persons compared with 18 in businesses employing 100 or more persons.

4.2 TECHNOLOGY EMPLOYMENT RATIOS, BY EMPLOYMENT SIZE

	<i>IT&T employees</i>	<i>IT&T employees/total employment</i>	<i>PC users per in-house IT&T employee</i>	<i>PC users per in-house IT&T employee/contractor</i>
	'000	%	no.	no.
1–4 persons	16	1.8	*69	32
5–19 persons	23	1.6	37	26
20–99 persons	21	1.5	31	23
100 or more persons	64	2.4	25	18
Total	123	2.0	32	22

SECTION 5

BUSINESS EXPENDITURE ON INFORMATION TECHNOLOGY

Total expenditure on information technology and telecommunications (IT&T) by employing businesses during 1997–98 was \$23,580m. On average, this represented expenditure on IT&T of \$3,700 per person employed and \$9,300 per PC user.

INDUSTRY

Across industries, expenditure on IT&T by employing businesses was highest in Finance and insurance (\$4,710m) and Property and business services (\$3,980m). On average, expenditure was \$18,200 per PC user and \$7,700 per PC user respectively in these industries. Although expenditure in Communication services was less than these other industries (\$2,840m), average expenditure per PC user in this industry was the highest of all industries at \$31,200 per PC user.

Wages and salaries of in-house IT&T employees for all industries accounted for 17% of total IT&T expenses. This proportion varied from 6% in the Construction industry to 21% in the Wholesale trade industry.

5.1 IT&T EXPENDITURE, BY INDUSTRY

	<i>Wages & salaries of in-house IT&T employees</i>	<i>Other IT&T expenses</i>	<i>Total IT&T expenses</i>	<i>Total IT&T expenses per person employed</i>	<i>Total IT&T expenses per PC user</i>	<i>Wages & salaries of in-house IT&T employees/total IT&T expenses</i>
	\$m	\$m	\$m	\$	\$	%
Mining	61	306	367	4 536	9 864	17
Manufacturing	585	2 289	2 873	2 886	8 128	20
Electricity, gas & water supply	86	419	505	11 050	13 644	17
Construction	*69	*1058	1 127	2 601	7 798	*6
Wholesale trade	559	2 107	2 666	5 624	10 710	21
Retail trade	160	1 263	1 423	1 192	4 359	11
Accommodation, cafes and restaurants	*79	376	454	1 013	5 899	17
Transport & storage	193	1 011	1 204	3 388	9 670	16
Communication services(a)	259	2 581	2 840	22 023	31 181	9
Finance & insurance	957	3 752	4 709	14 568	18 216	20
Property & business services	678	3 298	3 977	4 059	7 653	17
Health & community services	93	461	554	1 099	2 963	17
Cultural & recreational services	97	439	536	2 858	8 793	18
Personal & other services	*67	277	344	1 937	4 926	*19
Total	3 942	19 638	23 580	3 726	9 297	17

(a) Includes telecommunication services and postal and courier services.

BUSINESS SIZE

Expenditure on IT&T by large businesses (100 or more persons) accounted for 63% (\$14,910m) of total IT&T expenses for all employing businesses. IT&T expenditure per PC user was higher for larger businesses, with businesses employing 100 or more persons spending \$13,900 per PC user compared with \$6,800 per PC user for businesses employing 20–99 persons, \$5,800 per PC user for businesses employing 5–19 and \$5,300 per PC user for businesses employing 1–4 persons.

Wages and salaries of IT&T staff in small businesses (1–4 persons) was only 10% of IT&T expenses compared with 18% for businesses employing 20 or more persons.

5.2 IT&T EXPENDITURE, BY EMPLOYMENT SIZE

	<i>Wages & salaries of in-house IT&T employees</i>	<i>Other IT&T expenses</i>	<i>Total IT&T expenses</i>	<i>Total IT&T expenses per person employed</i>	<i>Total IT&T expenses per PC user</i>	<i>Wages & salaries of in-house IT&T employees/total IT&T expenses</i>
	\$m	\$m	\$m	\$	\$	%
1–4 persons	*226	2 049	2 274	2 581	5 339	*10
5–19 persons	514	3 078	3 592	2 496	5 752	14
20–99 persons	504	2 302	2 805	2 084	6 776	18
100 or more persons	2 699	12 210	14 909	5 599	13 909	18
Total	3 942	19 638	23 580	3 726	9 297	17

EXPLANATORY NOTES

INTRODUCTION

1 This publication presents final results from the 1997–98 Business Technology Survey which focused on measuring business use of information technology and telecommunications (IT&T) including the Internet. These results are based on a sample of 6,800 businesses recorded on the Australian Bureau of Statistics (ABS) Business Register. Preliminary results from the survey were released in *Business Use of Information Technology, Australia, Preliminary, 1997–98* (Cat. no. 8133.0).

SURVEY SCOPE AND METHODOLOGY

2 The survey results are based on a stratified random sample of the businesses recorded on the ABS Business Register with the population frame consisting of all business units in the Australian economy except for:

- agricultural businesses (defined in Division A of ANZSIC);
- education organisations (defined in Division N of ANZSIC);
- businesses classified to the General Government sector (noting that Public Trading Enterprises are included in the survey); and
- non-employed businesses in all industries.

3 Statistics on use of information technology by agricultural businesses in 1997–98 can be found in the data report *Use of Information Technology on Farms, Australia* (Product no. 8150.0.40.001).

4 Estimates for the Electricity, gas and water supply industry are provided separately where available and have been included in all totals. Due to the small sample size in the survey for this industry, it is considered that the data relating to the various penetration rates for this industry are not representative of the whole population and have therefore been suppressed. However, estimates for employment and expenses items have been included as the contribution to these items from problem strata are small. Results from an ABS Year 2000 Survey conducted in October 1998 indicate that the PC usage rate for the Electricity, gas and water supply industry was around 93%.

STATISTICAL UNIT

5 The unit for which statistics were reported in the survey was the management unit. The management unit is the highest-level accounting unit within a business or organisation, having regard to the required level of industry homogeneity, for which a set of accounts is maintained. In most cases it coincides with the legal entity owning the business (i.e. company, partnership, trust, etc.). However, in the case of large diversified businesses, there may be more than one management unit, with each coinciding with a 'division' or 'line of business'. A division or line of business is recognised where separate and comprehensive accounts are compiled for it.

CLASSIFICATION BY
INDUSTRY

6 This publication presents statistics classified according to the *Australian and New Zealand Standard Industrial Classification (ANZSIC) 1993* (Cat. no. 1292.0). Each business unit has been classified to a single industry on the basis of its main income earning activity, irrespective of whether the unit also generates income from related or unrelated secondary activities.

RELIABILITY OF ESTIMATES

7 The estimates presented in this publication are subject to sampling and non-sampling error.

SAMPLING ERROR

8 A sample of management units (including all units with more than 500 employees) was selected for this survey. Consequently, the estimates in this publication are subject to sampling variability, that is they may differ from figures that would have been obtained if all units had been included in the survey. One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might have varied by chance because only a sample of units was included.

9 There are about two chances in three that a sample estimate will differ by less than one SE from the figure that would have been obtained if a census had been conducted, and approximately 19 chances in 20 that the difference will be less than two SEs.

10 Sampling variability can be measured by the relative standard error (RSE) which is obtained by expressing the SE as a percentage of the estimate to which it refers. The RSE is a useful measure in that it provides an immediate indication of the percentage errors likely to have occurred due to sampling and thus avoids the need to refer also to the size of the estimate.

11 The tables below contain estimates of RSEs for a selection of statistics presented in this publication.

RELATIVE STANDARD ERRORS FOR TABLE 1.1, BUSINESS USE OF PCs AND THE INTERNET, BY INDUSTRY

	PCs	LAN/ WAN	Internet access	Email access	Web browser access	Web site/ home page	Number of businesses
	%	%	%	%	%	%	%
Mining	4	8	7	8	8	14	5
Manufacturing	6	12	12	12	14	20	6
Electricity, gas & water supply	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Construction	7	22	15	16	17	36	5
Wholesale trade	4	11	9	9	10	19	5
Retail trade	6	15	15	15	17	35	5
Accommodation, cafes & restaurants	7	19	16	17	17	26	4
Transport & storage	6	14	13	13	15	24	5
Communication services	14	35	23	23	26	44	15
Finance & insurance	10	22	19	19	20	36	11
Property & business services	4	11	8	8	9	22	4
Health & community services	5	14	10	11	11	29	4
Cultural & recreational services	6	16	11	11	12	19	6
Personal & other services	7	16	12	13	13	19	4
Total	2	5	4	4	5	9	2

RELATIVE STANDARD ERRORS FOR SELECTED ITEMS FROM TABLES 3.1, 4.1, AND 5.1, BY INDUSTRY

	PCs	PC users	Internet users	IT&T employees	Wages & salaries of in-house IT&T employees	Total IT&T expenses
	%	%	%	%	%	%
Mining	4	4	4	6	3	2
Manufacturing	3	3	6	10	9	5
Electricity, gas & water supply	3	2	3	4	4	3
Construction	17	14	14	40	37	25
Wholesale trade	7	7	10	15	16	12
Retail trade	13	10	18	45	18	7
Accommodation, cafes & restaurants	14	16	16	31	28	10
Transport & storage	5	5	10	12	8	4
Communication services	4	5	13	6	9	4
Finance & insurance	5	5	11	5	5	6
Property & business services	6	6	9	12	18	10
Health & community services	8	7	15	20	17	10
Cultural & recreational services	10	8	10	15	14	7
Personal & other services	13	8	13	36	50	13
Total	2	2	4	6	5	3

12 As an example of the above, an estimate of the percentage of businesses with personal computers in the Mining industry is 78% and the RSE is 4%, giving a SE of 3% (4% of 78%). Therefore, there would be two chances in three that, if all units had been included in the survey, a figure in the range of 75% to 81% would have been obtained, and 19 chances in 20 (i.e. a confidence interval of 95%) that the figure would have been within the range of 72% to 84%.

Non-sampling error **13** Errors other than those due to sampling may occur because of deficiencies in the register of units from which the sample was selected, non-response and imperfections in reporting by respondents. Inaccuracies of this kind are referred to as non-sampling errors and they may occur in any collection, whether it be a census or a sample. Every effort has been made to reduce non-sampling error to a minimum by careful design and testing of questionnaires, efficient operating procedures and systems and appropriate methodology.

ACKNOWLEDGMENT

14 ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated; without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the *Census and Statistics Act 1905*.

RELATED PUBLICATIONS

15 The most recent issue of other ABS publications on the use and production of IT&T goods and services in Australia are listed below:

Business Use of Information Technology, Australia, 1993–94
(Cat. no. 8129.0)

Business Use of Information Technology, Australia, Preliminary, 1997–98
(Cat. no. 8133.0)

Computing Services Industry, Australia, 1995–96 (Cat. no. 8669.0)

Government Information Technology, Australia, 1993–94
(Cat. no. 8119.0)

Household Use of Information Technology, Australia, February 1998
(Cat. no. 8128.0)

Household Use of Information Technology, Australia, 1998
(Cat. no. 8146.0)

Information Technology, Australia, 1995–96 (Cat. no. 8126.0)

Telecommunication Services, Australia, 1996–97 (Cat. no. 8145.0)

Use of the Internet by Householders, Australia, May 1999
(Cat. no. 8147.0)

Year 2000 Problem, Australia, October 1998 (Cat. no. 8152.0)

Year 2000 Problem, Australia, June 1999 (Cat. no. 8152.0)

SYMBOLS AND OTHER
USAGES

ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
IT&T	information technology and telecommunications
n.a.	not available
n.p.	not available for publication but included in totals where applicable
PAYE	pay as you earn
PC	personal computer
SE	standard error
RSE	relative standard error
*	subject to sampling variability too high for most practical purposes
**	subject to sampling variability too high for practical purposes
–	nil or rounded to zero

Where figures have been rounded, discrepancies may occur between the sum of the component items and the total.

GLOSSARY

Barcoding/scanning systems	Commonly used for tracking inventory and pricing goods e.g. a business scans the product barcode to read the price of the product into the cash register.
Electronic Funds Transfer Point of Sale (EFTPOS)	Referred to as EFTPOS and is a method of purchasing/making payments (i.e. a method for performing a financial transaction).
Email	Electronic mail is a facility which allows network users locally and worldwide to exchange messages, including text and attachments.
Employing businesses	Businesses which had employees at 30 June 1998. It excludes those businesses which had working proprietors or partners or non-salaried directors, but no employees.
Home page	Also referred to as a web site. This is an electronic document which provides information in a textual, graphical or multimedia format and is accessed via the Internet. It should be noted that where multi management unit enterprise groups had a home page, all management units within the enterprise group have been recorded as having a web site/home page.
Information technology & telecommunications (IT&T)	Information technology and telecommunications refers to the services and technologies that enable information to be accessed, stored, processed, transformed, manipulated and disseminated, including the transmission or communication of voice and/or data over a variety of transmission media. Transmission media include telephone, facsimile, Internet data lines, satellite, microwave, radio, etc.
In-house IT&T employees	This includes those employees and working proprietors providing IT&T services mainly to computer users within the organisation.
Interactive Voice Response (IVR)	Is an automated process of dealing with clients. For example, recorded phone messages directing the caller to dial a specific number/s to enable a specific activity to occur.
Internet	This is a world-wide public computer network. Organisations and individuals can connect their computers to this network and exchange information across a country and/or across the world. The Internet provides access to a number of communication services including the world wide web and carries email, news, entertainment and data files.
Internet users	Refers to all employees and working proprietors and partners with authorised access to the Internet.
IT&T contract persons	This item includes those contract persons predominantly engaged in providing IT&T services for whom pay as you earn (PAYE) tax is not deducted.

IT&T employees	Refers to all employees and working proprietors and partners who are predominantly engaged in IT&T work of a support nature to system users. They could mainly be providing services to users within the business or to external organisations/persons. Excluded are employees predominantly engaged in manufacturing, sales and/or performing data capture/entry and keying. Also excluded are contractors for whom PAYE tax is not deducted.
Local Area Network (LAN)	LAN refers to a network of computers and devices installed within a single physical property area.
Management unit	The management unit is the highest-level accounting unit within a business or organisation, having regard to the required level of industry homogeneity, for which a set of accounts is maintained. In most cases it coincides with the legal entity owning the business (i.e. company, partnership, trust, etc.). However, in the case of large diversified businesses, there may be more than one management unit, with each coinciding with a 'division' or 'line of business'. A division or line of business is recognised where separate and comprehensive accounts are compiled for it.
Other IT&T expenses	This data item includes all payments relating to telecommunication services, payments for leased IT&T equipment, depreciation of IT&T equipment, repair and maintenance expenses and non-capitalised purchases of IT&T goods and services for own use. It also includes contract payments for IT&T services but excludes purchases of IT&T goods/services bought for resale and wages and salaries of IT&T employees mainly providing IT&T goods/services to external organisations.
Personal Computers (PC)	These are personal computer workstations, both IBM compatible and Macintosh/Apple systems, such as desktops, portables, laptops, notebooks, hand held and pen-based machines, and other similar single user devices with high graphic capabilities. It excludes mainframes, super computers, mini-computers with their associated terminals and PCs used solely as servers.
PC users	Refers to all employees and working proprietors and partners with authorised access to personal computers.
Total employment	Includes working proprietors, working partners, permanent, part-time, temporary and casual staff (including managerial and executive employees) working for the business. Employees on paid leave are also included.
Total IT&T expenses	This item includes wages and salaries of in-house IT&T employees and other IT&T expenses.
Video conferencing/ teleconferencing	Refers to a method of transmitting voice and images and is 'live', full colour, two-way video and audio communication.

Wages and salaries of in-house IT&T employees	This item is wages and salaries of those IT&T employees engaged in providing IT&T services to employees of the organisation, including severance, termination and redundancy payments and provision expenses for employee entitlements. It excludes payments to contractors, consultants and persons paid solely by commission without a retainer.
Web browser	A program specifically designed for navigating the Internet, including the world wide web.
Web site	Refer to the definition for home page.
Wide Area Network (WAN)	WAN refers to computers connected to a decentralised network.

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2812900007977
ISBN 0 642 27536 X

RRP \$17.50