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THE APPLICATION OF INFORMATION SYSTEMS IN AUSTRALIAN LOCAL GOVERNMENT

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ABSTRACT

The utilisation of computer-based information systems in Australian local government has been influenced by the traditional local authority attitude of "doing its own thing" and the lack of appropriate policies to support local, state and national information infrastructure requirements. Generally, each authority is responsible for the specification and implementation of its own computer system requirements. However, with the role of local government changing from primarily a "roads and potholes" orientation to one of a provider of a widening range of community services coupled with the need to strengthen its influence within the three-tier government structure, the way in which local government manages and utilises its information technologies is being accorded increasing attention.

How Australian local authorities are meeting this strategic challenge is explored by examining the future directions of information system development and application as forecast by local government managers through focusing on projected application growth; projected computer installation tasks; and predictions for information systems environments into the 1990's.

KEYWORDS

Information Systems; Computers; Application Software; Local Government; Municipal Government; Information System Planning; Information System Management.

INTRODUCTION

The role of Australian local government is changing from primarily a "roads and potholes" orientation to one of a provider of a widening range of community services (Floyd and Palmer, 1985). These services include not only physical community infrastructure support such as roadways, water, sewerage, drainage, transport, town planning, parks, recreation, libraries and so on but also the emerging requirements of community welfare, housing, aged care, employment programs, economic development, environmental management etc. This changing role, coupled with increasing demands from taxpayers for an improved return on their tax dollar and for more involvement in the management activities of their local community, has meant that Australian local governments are being forced to reassess their functions and responsibilities as well as the level of information technology support employed (Floyd and Palmer, 1985; Osborn, 1987). Consequently, this complex, dynamic municipal environment is generating heavy demands on the data/information processing and decision-making capabilities of local government (Newton and Taylor, 1986).

This demand for enhanced information processing capability, in combination with rapid advances in information technology, is creating tensions within local government. An authority is not only faced with choosing from a bewildering proliferation of computerised opportunities which may or may not ideally suit its requirements, but also with solutions which cut across traditional organisational boundaries with attendant responsibility and accountability considerations. Furthermore, management needs to be on guard against excessively complex governance processes which are conceivable, based on the level of information technology support available, but which are not practical nor appropriate regardless of the inducements offered by the technology (Wellar, 1983).

Within this scenario enthusiasm about computer processing and information technologies has produced claims that government productivity and efficiency can be achieved by technology adoption (Ayres and Kettinger, 1983). However, disappointingly, research has indicated that local government is not realising the benefits being promoted (Danziger, 1977; Kling, 1978; Kraemer and King, 1978; Kraemer, Dutton and Northrop, 1981; Northrop, Dutton and Kraemer, 1982; Hughes, 1984; Loy, 1986; MacDonald, 1986). Evaluating the "worth" of urban information systems toward the end of the 1970's, Danziger (1977) and Kraemer and King (1978) found that although there was a positive impact on authority operations by computerisation, this impact was considerably less spectacular than predicted particularly in terms of reducing costs. Significantly, in 1984 and 1986 Hughes (1984) and MacDonald (1986) were still highlighting this shortcoming.

A critical management issue is not whether to use the technology, but rather what aspects of the technology should be applied and how best should these be combined and integrated for the betterment of the organisation (Technology Policy and Development Division, 1986; Boynton and Zmud, 1987). This is particularly true for local government. Local authorities are too often regarded as the "poor" relations in the three tier Australian government structure (local/state/federal). The ability of local government to strengthen its role and influence in this relationship can be enhanced by the way in which it manages and utilises its information technology resources.

How local government is moving towards developing this strategic advantage is explored by examining the future directions of information system development and application as forecast by Australian local government managers through focusing on:
- projected application growth;
- projected computer installation tasks;   and
- authority predictions for information systems into the 1990's.

RESEARCH METHODOLOGY

A comprehensive mail-out questionnaire survey of all local authorities in Australia during 1987 (Earle and Learmonth, 1988) was utilised as the instrument to collect data for this research. The survey encompassed a broad range of issues related to information technology use in local government including such aspects as details of computer system platforms; software applications in use/being planned; supplier details; technology operation; organisation structure; budget; planning; and management. A response rate of 81 percent was achieved.

A series of relational data-bases were designed to facilitate storage of the survey data and to support analysis requirements. Data from returned questionnaires were keyed directly into the data-bases via suitably designed input screens. Data input checking routines were built into these screens. The contents of each file were call-checked back against the original questionnaires to correct any keying-in errors. The use of coded response boxes and a minimum of open-ended questions assisted in achieving data accuracy. Each authority was assigned a unique identification number to assist with data identification while maintaining a necessary degree of confidentiality.

The statistical functions incorporated in the relational data base software were used in combination with specifically developed SQL routines to support data analysis. Relational and Boolean algebra techniques were used to extract and analyse data. Close attention was given to checking that the initial analysis results were logical and within acceptable bounds (eg code numbers were valid, frequencies within bounds and cross checking between tables).

CURRENT APPLICATION OF INFORMATION TECHNOLOGY

Due to their diverse nature in terms of size (population and area), finance base, responsibilities and services provided, Australian local authorities are clustered into classifications through a method proposed by Harris (1975) and adapted by the Advisory Council for Intergovernment Relations (ACIR). The following ACIR classifications apply (the number indicating the ACIR classification):

1 Developed Metropolitan: An authority whose largest population component is wholly resident within an urban centre of 500,000 people or more;

2 Fringe Metropolitan: An authority whose largest population component is partially resident within an urban centre of 500,000 people or more;

3 Provincial Cities: An authority whose largest population component is resident in a non-metropolitan city with a population in the range of 25,000 - 499,999;

4 Small Cities: An authority whose largest population component is resident in a non-metropolitan centre in the range of 10,000 - 24,999;

5 Rural Town: An authority whose largest urban population component is resident in a centre with a population range of 1,000 - 9,999;

6 Rural: An authority whose largest population component is resident in a centre with a population less than 1,000.

ACIR classification 1 to 3 authorities are predominantly urban-based while classifications 4 to 6 are mainly rural-based.

Using the year of computer system adoption as the base-line, it can be demonstrated that computer use by Australian local government increased markedly during the 1980's (Figure 1). There was substantial growth across all States during this period, particularly in Queensland and Western Australia where the number of users approximately doubled - from 42 percent in 1982 to 74 percent in 1987 in Queensland and from 30 percent to 70 percent in Western Australia. The majority of local governments in these States are in the rural-based ACIR classifications of 4 to 6. However, there were up to 40 percent of users in some states still not using computer support.

FIGURE 1
COMPUTER ADOPTION BY AUSTRALIAN LOCAL GOVERNMENT 1965 to 1986

Year of adoption of inhouse computing
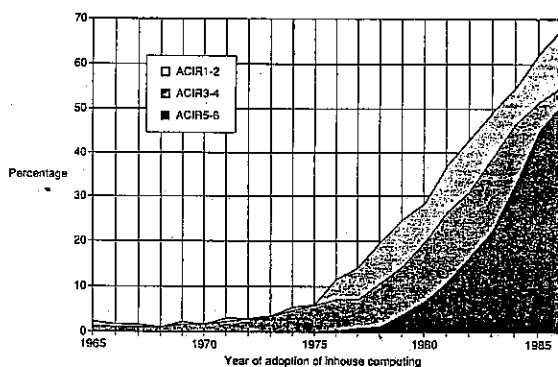
Local government information needs have been identified by Manning (1977, 1978); Osborne (1983); and Arnold (1984) as:
- nation wide - those that may assist in the development of national or state policies and programmes involving local government;
- state and region wide - auditing, financial reporting and similar statutory requirements imposed by higher government; and
- individual authority - corporate information needs of individual councils. Within a local authority, information is used to provide fiscal compliance; support financial viability and management; evaluate performance and cost of provided services; and keep the community informed on services and activities undertaken (Hughes, 1984).

common within this structure is the need to:
- identify, describe and define matters or issues of current and future concern;
- assess events, situations or processes in terms of associated or alternative costs and benefits; and
- translate data, study findings and deliberations which effectively represent the public and community interest (Wellar, 1986).

Within this need environment the application of information systems has been influenced by the traditional local government attitude of "doing its own thing" and the lack of appropriate policies to support local, state and national information infrastructure requirements. Generally, each authority is responsible for the specification and implementation of its own computer system requirements; the development of formal support centres at regional or state levels is not evident.

'nalysis of the application responses across all ACIR classifications placed the average number of applications in some larger authorities in excess of 100, while across all States for all authority sizes an average of more than 55 applied. Figure 2 indicates that Tasmania (112 applications) and Queensland (110 applications) in ACIR classifications 1 and 2 had the highest average number of applications while Western Australia (47 applications) in ACIR classifications 3 and 4 and South Australia (45 applications) in ACIR classifications 5 and 6 had the lowest. Because of their small number, the Northern Territory responses were incorporated in South Australia.

The larger authorities, while generally operating a greater range of applications, also tended to have a more sophisticated portfolio, both in terms of the type of tasks computerised and the degree of computer assistance involved.

FIGURE 2
AVERAGE NUMBER OF APPLICATIONS
BY STATE WITHIN ACIR CLASSIFICATION GROUPING
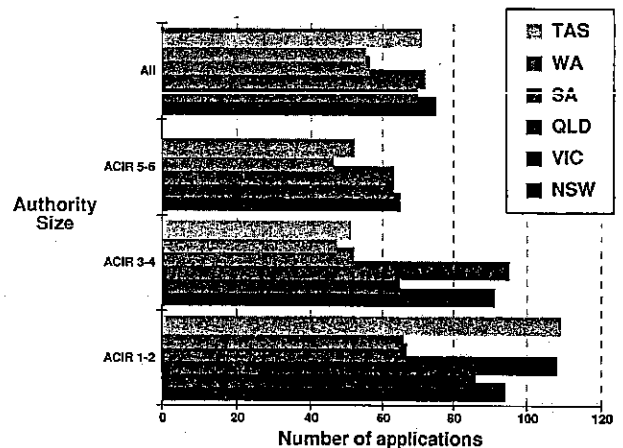
As the basic functions of local authorities revolve around revenue raising, financial accounting and service provision, a high degree of process commonalty exists. As depicted by Figure 3, an analysis of applications across all authorities identified 17 applications with greater than 50 percent commonalty. Commonalty of application is defined as the percentage of authorities operating a given application (eg in Figure 3, of all authorities using computer systems, over 95 percent were operating Rate Notice software). Rating, Accounting, Payroll and Costing type applications (the revenue, accounting and service processes) dominated this commonalty list with over 95 percent of all authorities running Rate Notices and Payroll systems.

FIGURE 3
APPLICATIONS WITH GREATER THAN
50 PERCENT COMMONALTY

Percentage of Authorities using computers
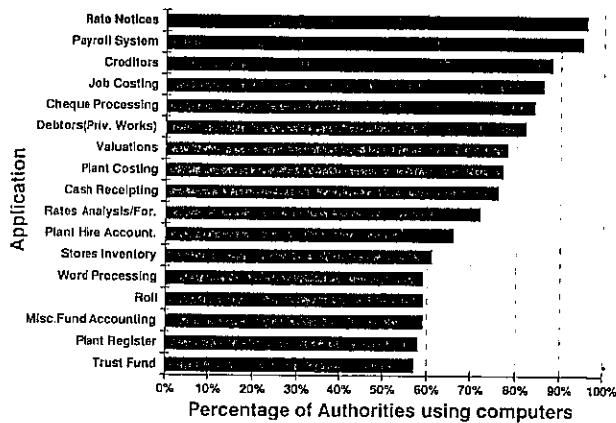
This application commonalty illustrates local government's concentration on applying computer technology to routine, well-defined and understood calculating, printing and record-keeping tasks. Finance and Administration functions have been, and will continue to be, the most commonly automated. However, as these functional areas achieve what they determine as an acceptable level of support, a redirection of computing effort to other areas particularly Engineering, Community Services, Planning and Development and Personnel takes place.

Table 1
Information Technology in Local Government

	Era 1 1950-1980	Era 2 1980-2000
Technology	Application of mainframe and mini computers.	Utilisation of mainframe mini and microcomputers combined with database management software. Telecommunication and its convergence with computers.
Application	Internal focus on well defined clerical procedures aimed at enhancing operational performance with little interaction with the "outside" world.	Strategic applications of information technology. Internal focus on enhancing management planning and control. External focus on promoting listening and informing relationships between the authority and its community.
Impacts	Ability to handle large and increasing information volumes. Internal operations supported by quicker and more informed decision making. Stable authority structure size despite increasing service demands. Control and "ownership" of information resource contributing to organisational politics.	More effective and efficient authority operations by shared use of information and community access to service systems. Stable authority structure size despite increased community participation and requirements coupled with "tailoring" of services. Information resource control and "ownership" politics increased by external use of information.

Kraemer and King (1984) Figure 3 (p20)

Two major eras can be defined in the application of information technology in local government (Kraemer and King, 1984). These eras are summarised in Table 1. The first era was oriented towards facilitating the role of local government as an efficient manager of basic urban services. Influenced by supply-push and demand-pull, the second era is moving towards supporting a more integrated information environment and developing strategic advantage provided by information technology.

However, even though there has been movement towards management support, MacDonald (1986) maintains that the focus has been primarily on operational procedures and senior management are still largely dep rt on traditional paper-based information. Generally, this is applicabl / australian local authorities. Although substantial growth of applica'ion portfolios took place during the 1980's, this growth centred primarily on financial, budgeting and administrative type areas.

PROJECTED APPLICATION GROWTH

Local government needs to develop and enhance its capability to support strategic information management systems to strengthen its role and influence in inter-government relations. To identify the future growth of application portfolios, the Town/Shire Clerks for all ACIR classifications and Computer Managers for ACIR classifications 1 to 3 ranked a list of ten application categories in order of their likely growth over the next five years. This list was derived from previous research in Australia by the author and through discussions with local authority officers and elected local government representatives:

(A) Accounting
(B) Budget/Financial Management
(C) Office Management
(D) Community Services
(E) Engineering
(F) Statutory Planning and Development
(G) Strategic Planning
(H) Utilities
(I) Personnel
(J) Geoprocessing/Land Information Systems

Tables 2 to 4 define the mean application category growth rankings for ACIR classifications 1 to 3 and 4 to 6. Only those authorities fully completing this section of the survey questionnaire were analysed.

Application portfolio growth over the next five years will be dominated by a financial recording and management focus. This reflects the tightening fiscal constraints under which local authorities are operating. Most authorities are evidently still mainly concerned with short-term planning and management by way of yearly budgets, financial accounting, keeping track of paperwork etc. Likely growth in long-term planning areas such as Strategic Planning, Statutory Planning & Development and Geoprocessing/Land Information Systems was not rated as being strong.

TABLE 2
RANKING FOR APPLICATION CATEGORY GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 1 - 3   TOWN/SHIRE CLERK

Application Category	Mean	Std Devn
(B) Budget/Financial Management	3.05	2.39
(E) Engineering	4.48	2.35
(C) Office Management	4.50	2.29
(A) Accounting	5.12	3.04
(F) Statutory Planning & Development	5.33	2.55
(D) Community Services	5.54	2.77
(J) Geoprocessing/Land Information Systems	5.57	3.19
(G) Strategic Planning	5.76	2.68
(I) Personnel	6.58	2.11
(H) Utilities	8.37	2.08

N = 147

TABLE 3
RANKING FOR APPLICATION CATEGORY GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 1 - 3   COMPUTER MANAGER

Application Category	Mean	Std Devn
(B) Budget/Financial Management	3.29	2.49
(C) Office Management	4.42	2.34
(E) Engineering	4.60	2.35
(A) Accounting	4.79	2.96
(J) Geoprocessing/Land Information Systems	5.38	3.42
(F) Statutory Planning & Development	5.51	2.41
(D) Community Services	5.67	2.85
(G) Strategic Planning	5.88	2.57
(I) Personnel	6.42	2.37
(H) Utilities	8.47	1.99

N = 144

There was relatively high ranking concurrence in the ACIR 1 to 3 authorities between the Town/Shire Clerk and the Computer Manager. The main difference occurred in the ranking of Geoprocessing/Land Information Systems above Statutory Planning & Development and Community Services by Computer Managers. They also ranked Office Management ahead of Engineering while the Town/Shire Clerks reversed this ranking although by only a very small margin.

TABLE 4
RANKING FOR APPLICATION CATEGORY GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 4 - 6   TOWN/SHIRE CLERK

Application Category	Mean	Std Devn
(B) Budget/Financial Management	2.34	1.73
(A) Accounting	3.17	2.43
(C) Office Management	4.25	2.10
(E) Engineering	4.61	2.30
(F) Statutory Planning & Development	5.81	2.30
(I) Personnel	6.44	2.20
(J) Geoprocessing/Land Information Systems	6.61	3.06
(D) Community Services	6.72	2.45
(G) Strategic Planning	6.86	2.18
(H) Utilities	7.93	2.03

N = 301

Budgeting/Financial Management was the most significant growth category reported by all authorities irrespective of ACIR classification. However, as the mean values and standard deviation results attest, ACIR classification 4 to 6 authorities were more closely aligned in their ranking of this growth area. Across all authorities, Engineering, Office Management and Accounting featured as the next highest growth areas, although the ACIR 4 to 6 group ranked Accounting above Office Management and Engineering. This indicates that the majority of small authorities, because of their more recent adoption of computer support, were still occupied with achieving computerisation of their financial recording, planning and management requirements. Despite the interest in Office Management, a low growth rate was predicted in Personnel systems although ACIR classification 4 to 6 authorities did rank this higher than the ACIR 1 to 3 group. Authorities evidently consider Personnel systems are not significant contributors to Office Management.

The spread of projected growth ranking reflects the diversity of application portfolio maturity across authorities and emphasises the lack of coordinated system development both within and across States.

PROJECTED INSTALLATION TASKS

The Town/Shire Clerks for all ACIR classifications and Computer Managers for ACIR classifications 1 to 3 predicted their computing facility requirements over the next five years by ranking a list of seven facility tasks in order of their likely importance. The ranking was from 1 for most important to 7 for least important. The tasks comprised:

(A) Microcomputer Acquisitions
(B) Office Automation Projects
(C) Telecommunications Enhancements
(D) Central Facility Operations
(E) Mainframe/Mini/Microcomputer Linkages (eg data transfer)
(F) Local Area Network Developments
(G) Turnkey Application Purchases.

Tables 5 to 7 define the mean application category growth rankings for ACIR classifications 1 to 3 and 4 to 6. Only those authorities fully completing this section of the survey questionnaire were analysed.

TABLE 5
RANKING FOR INSTALLATION TASK GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 1 - 3   TOWN/SHIRE CLERK

Installation Task	Mean	Std Devn
(E) Mainframe/mini/microcomputer Linkages	2.87	1.57
(B) Office Automation Projects	2.92	1.57
(D) Central Facility Operations	3.68	2.12
(A) Microcomputer Acquisitions	3.76	1.93
(F) Local Area Network Developmnt	4.49	1.87
(C) Telecommunications Enhancemnt	4.99	1.69
(G) Turnkey Application Purchases	5.19	1.89

N = 142

TABLE 6
RANKING FOR INSTALLATION TASK GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 1 - 3   COMPUTER MANAGER

Installation Task	Mean	Std Devn
(E) Mainframe/mini/microcomputer Linkages	2.94	1.57
(B) Office Automation Projects	3.12	1.54
(D) Central Facility Operations	3.46	2.06
(A) Microcomputer Acquisitions	3.74	1.88
(F) Local Area Network Developmnt	4.54	1.89
(C) Telecommunications Enhancemnt	4.97	1.75
(G) Turnkey Application Purchases	5.21	2.08

N = 145

TABLE 7
RANKING FOR INSTALLATION TASK GROWTH
OVER NEXT 5 YEARS
ACIR CLASSIFICATION 4 - 6   TOWN/SHIRE CLERK

Installation Task	Mean	Std Devn
(B) Office Automation Projects	2.64	1.60
(A) Microcomputer Acquisitions	3.50	1.93
(D) Central Facility Operations	3.61	1.98
(E) Mainframe/mini/microcomputer Linkages	3.91	1.83
(C) Telecommunications Enhancemnt	4.36	1.82
(F) Local Area Network Developmnt	5.01	1.74
(G) Turnkey Application Purchases	5.07	2.01

N = 276

The ACIR 1 to 3 classification authorities ranked Mainframe/Mini/Microcomputer Linkages as their highest priority, while the ACIR 4 to 6 authorities rated Office Automation Projects as their most important task. This reflects the more intense mainframe/mini computer orientation of the larger authorities as well as their concern with system integration given the expanding utilisation of microcomputers. All authorities rated Central Facility Operations as their third most important task. In light of the priorities accorded to Office Automation and Mainframe/mini/microcomputer Linkages, the low priority accorded to Local Area Networks indicates that local authorities do not view this as an integral part of their top ranked tasks. The low ranking of Turnkey Application Purchases was common across both ACIR groups thus indicating that local government viewed its future software support as requiring more than an off-the-shelf approach.

INFORMATION SYSTEMS INTO THE 1990's

All authorities were requested to either strongly agree, agree, disagree or strongly disagree with each prediction in a set of predictions about their computing environments five years into the future. A set of 26 predictions was provided to Town/Shire Clerks and Computer Managers in ACIR classification 1 to 3 authorities (Appendix A), while a subset of 11 predictions applicable to smaller authorities was provided to Town/Shire Clerks in ACIR classifications 4 to 6 (Appendix B).

TABLE 8
FREQUENCY TABLE EVALUATION OF THE FUTURE OF INFORMATION SYSTEMS IN LOCAL
GOVERNMENT   ACIR 1 - 3 TOWN/SHIRE CLERK

Q ID	9	N	Responses 1	2	3	4	Mean	Std Devn
N	2	149	0	5	98	46	3.28	0.52
Z	3	148	2	8	97	41	3.20	0.59
A	1	150	4	22	79	45	3.10	0.74
H	1	150	0	19	101	30	3.07	0.57
Y	1	150	2	25	84	39	3.07	0.69
K	1	150	0	15	112	23	3.05	0.50
G	1	150	1	14	112	23	3.05	0.52
B	2	149	1	17	109	22	3.02	0.54
I	1	150	3	22	97	28	3.00	0.65
C	2	149	1	43	79	26	2.87	0.69
X	4	147	4	40	75	28	2.86	0.75
V	1	150	4	38	94	14	2.79	0.64
O	2	149	6	37	89	17	2.79	0.69
Q	4	147	3	37	99	8	2.76	0.58
F	3	148	0	56	71	21	2.76	0.68
E	1	150	6	46	77	21	2.75	0.74
U	2	149	1	54	83	11	2.70	0.61
P	3	148	7	52	75	14	2.65	0.72
M	5	146	5	55	86	0	2.55	0.56
L	4	147	3	63	78	3	2.55	0.58
S	4	147	4	63	75	5	2.55	0.61
W	2	149	7	75	63	4	2.43	0.63
R	4	147	5	80	57	5	2.42	0.62
T	3	148	7	86	53	2	2.34	0.59
J	2	149	33	97	19	0	1.91	0.59
D	2	149	44	96	8	1	1.77	0.57

9 not applicable   N number of analysed
                              responses
1 strongly disagree   2 disagree
3 agree   4 strongly agree

As indicated in Tables 8 and 9, the Town/Shire Clerk and Computer Manager in ACIR 1 to 3 authorities agreed on the top three most likely predictions (although in slightly different order):

N end-user understanding of computing and its uses will increase
  substantially
Z ensuring system compatibility will be a major responsibility of
  the computing department
A local government's use of bureaux will be negligible

with the lowest five least likely to eventuate being:

W as new equipment is adopted, older equipment will be
  increasingly handed-down within the organisation, thereby
  expanding access to computing
R the costs of modifying turnkey systems to fit organisational
  needs will greatly reduce their use
T end-user computing will generate a greater need for large
  central mainframes
J end-user computing growth will include personnel in all the
  organisation's functional areas an increasing number of
  Computing managers will be promoted to the position of Chief
  Executive Officer.

There were variations in the prediction responses lying between the top three and lowest five.

TABLE 9
FREQUENCY TABLE EVALUATION OF THE FUTURE OF INFORMATION SYSTEMS IN LOCAL
GOVERNMENT   ACIR 1 - 3 COMPUTER MANAGER

Q ID	9	N	Responses 1	2	3	4	Mean	Std Devn
Z	6	150	1	11	91	47	3.23	0.60
N	6	150	1	7	107	35	3.17	0.53
A	5	151	3	21	75	52	3.17	0.73
G	5	151	1	8	116	26	3.11	0.49
B	5	151	0	14	111	26	3.08	0.51
H	6	150	0	22	94	34	3.08	0.61
K	6	150	0	12	118	20	3.05	0.46
C	5	151	2	22	96	31	3.03	0.64
Y	7	149	2	25	90	32	3.02	0.66
I	6	150	4	29	100	17	2.87	0.63
O	5	151	5	34	90	22	2.85	0.70
V	6	150	2	40	89	19	2.83	0.65
F	8	148	0	50	80	18	2.78	0.64
U	6	150	4	46	87	13	2.73	0.65
E	6	150	5	52	76	17	2.70	0.71
X	7	149	9	50	67	23	2.70	0.80
Q	9	147	6	47	81	13	2.69	0.69
S	14	142	1	52	81	8	2.68	0.59
M	12	144	4	49	86	5	2.64	0.60
L	11	145	3	58	79	5	2.59	0.60
P	11	145	11	55	63	16	2.58	0.79
R	10	146	7	70	64	5	2.46	0.64
W	6	150	10	68	66	6	2.45	0.68
T	9	147	7	80	51	9	2.42	0.68
J	6	150	30	99	19	2	1.95	0.62
D	5	151	33	98	17	3	1.93	0.64

9 not applicable   N number of analysed
                              responses
1 strongly disagree   2 disagree
3 agree   4 strongly agree

There was general agreement between Clerks and Computer Managers that the integration of systems will be a primary goal of computer support expansion, with this support extending to end-users in all functional areas within an authority. User-friendly operating systems will be favoured over those which are more technically superior, with these systems being increasingly adapted or developed to meet individual user needs. While end-user understanding of computing and its uses is predicted to increase substantially, the majority of Clerks and Computer Managers agree that technical expertise will continue to reside within the Computing Department rather than be dispersed throughout the organisation. Computing Managers will not be promoted to Chief Executive Officers, however their organisational role will evolve into a greater range of management responsibilities.

In the smaller authorities as defined in Table 10, ACIR classification 4 to 6 Town/Shire Clerks identified:

  C maintaining core administrative computing (eg finance, revenue collection, personnel/payroll systems etc)
  H end-user understanding of computing and its uses will increase substantially
  D computing use will be expanded into the functional areas not currently involved in computing

as their top three most likely predictions with

  N local authorities will spend a greater proportion of their budget on computing
  K hardware maintenance support will NOT be a problem in the future
  L software maintenance support will NOT be a problem in the future

as the least likely to eventuate.

TABLE 10
FREQUENCY TABLE EVALUATION OF THE FUTURE OF INFORMATION SYSTEMS IN LOCAL GOVERNMENT   ACIR 4 - 6   TOWN/SHIRE CLERK

Q ID	9	N	1	2	3	4	Mean	Std Devn
C	6	336	3	33	211	89	3.15	0.61
H	7	335	0	19	253	63	3.13	0.48
D	5	337	0	17	263	57	3.12	0.45
E	8	334	4	36	230	64	3.06	0.59
O	6	336	1	44	231	60	3.04	0.57
A	7	335	11	54	192	78	3.01	0.73
F	6	336	2	54	222	58	3.00	0.60
G	9	333	1	44	252	36	2.97	0.50
B	5	337	6	47	244	40	2.94	0.57
I	22	320	4	75	222	19	2.80	0.55
M	5	337	5	90	226	16	2.75	0.56
J	6	336	10	108	176	42	2.74	0.71
N	5	337	6	108	205	18	2.70	0.60
K	4	338	12	125	188	13	2.60	0.62
L	4	338	25	157	148	8	2.41	0.66

9 not applicable   N number of analysed responses
1 strongly disagree 2 disagree
3 agree   4 strongly agree

In concert with their larger counterparts, small authorities predict system integration will be a primary goal of computer support expansion with user-friendly operating systems being favoured over those which are more technically superior. End-user computing growth will extend to all functional areas within an authority with systems being increasingly adapted or developed to meet individual needs.

Small authorities believe that in addition to maintenance support problems (K and L), software availability will continue to be a problem. All authorities do not readily see their system purchases being restricted to one or very few vendors. This indicates that local authorities do not consider a restricted supplier profile capable of satisfying their system needs.

Future predictions from non-computer using authorities in the ACIR 4 to 6 classifications are provided in Table 11. There was a very high degree of commonalty with the computer-user predictions in Table 10. This indicates that there is a diffusion of computing experiences throughout local authorities.

TABLE 11
EVALUATION OF THE FUTURE OF INFORMATION SYSTEMS IN LOCAL GOVERNMENT
ACIR 4 - 6   NON COMPUTER USERS

Quest ID	9	N	Mean	Standard Deviation
C	27	113	3.23	0.56
H	25	115	3.10	0.50
O	25	115	3.05	0.59
B	22	118	3.04	0.55
F	23	117	3.02	0.60
D	24	116	2.97	0.41
E	24	116	2.97	0.53
G	27	113	2.94	0.54
A	27	113	2.89	0.71
I	33	107	2.81	0.48
N	23	117	2.79	0.58
J	24	116	2.78	0.63
M	25	115	2.68	0.55
K	26	114	2.39	0.66
L	25	115	2.31	0.58

9 not applicable
N number of analysed responses

Coupled with the predicted expansion of computing support to encompass all functional areas, the majority of all authorities agree that they will be increasingly pressured to participate in State-wide information systems.

CONCLUSION

The application of computer support in local government has proven to be more complex than originally envisaged. The initial slow adoption rates by Australian authorities reflects this situation although, as technology costs reduced and software application support increased, the rate accelerated noticeably during the 1980's.

Computer application has been influenced by the traditional local government attitude of "doing its own thing" and the lack of appropriate policies to support local, state and national information infrastructure requirements. Generally, each authority is responsible for the specification and implementation of its own computer system requirements; the development of formal regional or state support centres is not evident.

In part, this is due to the diverse nature of Australian authorities in terms of size (population and area), finance base, responsibilities, services provided and computing maturity.

The propensity to initially computerise well-defined and well-understood clerical procedures is highlighted through the dominance of rating, accounting, payroll and costing type applications. However, a shift from primarily a simple clerical processing focus to one of supporting responsive management information systems is commencing as demonstrated by the development of such applications as office automation, personnel, budget management, planning and development and so on. Nevertheless, based on a projected application portfolio growth dominated by a financial recording and management focus with some attention being accorded to engineering requirements, most authorities are evidently still mainly concerned with short-term planning and management by way of yearly budgets, financial accounting, keeping track of paperwork etc. Projections of growth in long-term planning areas such as strategic planning, statutory planning and development and geoprocessing/land information systems are limited.

Local government in Australia is commencing to address the strategic challenge of strengthening its role and influence in inter-government relationships through enhancing the way in which it manages and utilises its information technology resources. However, as demonstrated by this research, the wide range of planning priorities reported for both application category and installation task growth accentuates the need for coordinated planning across authorities within individual States and across States.

REFERENCES

Arnold, B. (1984). Information Sharing for Local Government in Australia. Management Development Centre, RMIT, Melbourne.

Ayres, Q.W., Kettinger, W.J. (1983). Information Technology and Models of Governmental Productivity. Public Administration Review V43:6:561-56.

Boynton, A.C., Zmud, R.W. (1987). Information Technology Planning in the 1990's: Direction for Practice and Research. MIS Quarterly V11:1:59-71.

Danziger, J.N. (1977). Computers, Local Government and the Litany to EDP. Public Administration Review V37:2:28-37.

Earle, T.R., Learmonth, R.D. (1988). Information Systems in Local Government. Australian Government Printing Service, Canberra.

Floyd, J., Palmer, D. (1985). Corporate Management in Local Government: An Introduction. Hargreen Publishing Company, North Melbourne, VIC.

Harris, C.P. (1975). The Classification of Australian Local Authorities. Centre for Research on Federal Financial Relations, Research Monograph No 9, ANU, Canberra.

Hughes, J.W. (1984). MIS for State and Local Governments. Journal of Systems Management V35:11:25-31.

Kling, R. (1978). Automated Client Welfare Tracking and Service Integration. Communications of the ACM V21:6:424-493.

Kraemer, K.L., Dutton, W.H., Northrop, A. (1981). The Management of Information Systems. Columbia University Press, New York.

Kraemer, K.L., King, J.L. (1978). Development of Urban Information Systems: Status and International Relevance of United States Experience. International Review of Administrative Sciences V44:3:221-232.

Kraemer, K.L., King, J.L. (1984). The Role of Information Technology in Managing the Metropolis. Public Policy Research Organisation, University of California, Irvine, California.

Loy, C.K. (1986). Computerisation for Land Administration and Urban Planning in Malaysia: A Case Study of Public Sector Innovation. Computers, Environment & Urban Systems V11:1-2:65-71.

MacDonald, B.A. (1986). Information Management in the Public Service. Summary of Discussions. Canadian Public Management V29:1:1-16.

Manning, B.H. (1978). Local Government Information Systems:A Necessary Tool for Local Development. LGA: Local Government Administration V18:3:41-43.

Manning, B.H. (1977). Local Government Information Systems. A Necessary Tool for Local Development. In Wells, J. (Ed). URPIS 5 Conference Proceedings. AURISA, Australia.

Newton, P.W., Taylor, M.A.P. (Eds) (1986). Microcomputers for Local Government Planning and Management. Hargreen Publishing Company, North Melbourne.

Northrop, A., Dutton, W.H., Kraemer, K.L. (1982). The Management of Computer Applications in Local Government. Public Administration Review V42:3:234-243.

Osborn, D. (1987). Information Needs for Infrastructure Development. National Seminar on Information in Local Government Decision Making, Canberra.

Osborn, R. (1983). Information Needs for Developing Local Government Involvement in National Programs. In Pathe, B., McDonald, G., Collier, B., Barker, P., (Eds). Urpis 11 Conference Proceedings. URISA, Australia.

Technology Policy and Development Division (1986). Advanced Techologies, A Review and an Analysis for Queensland Volume 1 Main Report. Department of Industry Development, Queensland.

Wellar, B.S. (1983). Systems and Services in an Information Society: Implications for Local Governments and Their Communities. In Pathe, B., McDonald, G., Collier, B., Barker, P., (Eds). URPIS 11 Conference Proceedings. AURISA, Australia.

Wellar, B.S.(1986). Information for Decision Making. Aurisa News V86:3:.

APPENDIX A

THE FUTURE OF INFORMATION SYSTEMS QUESTIONS
ACIR CLASSIFICATIONS 1 - 3

A local government's use of bureaux will be negligible
B local government will be increasingly pressured to participate in State-wide information systems
C the Computing Manager's organisational role will evolve into a greater range of management responsibilities

D an increasing number of Computing managers will be promoted to the position of Chief Executive Officer
E maintaining core administrative computing (eg finance, revenue collection, personnel/payroll systems) will be the top priority
F meeting new end user demands will be the top computing priority
G computing use will be expanded into the functional areas not involved with computing
H systems integration will be the primary goal of systems expansion
I systems will be increasingly adapted or developed to meet individual officer's end user needs
J end-user computing growth will include personnel in all the organisation's functional areas
K end user computing growth will include personnel in all the organisation's functional areas
L demonstration facilities within Information Centres or Office Support Groups will become major means for defining end user needs
M demonstration facilities within Information Centres or Office Support Groups will be managed by the Computing Department
N end-user understanding of computing and its uses will increase substantially
O while computer literacy will spread through the organisation, technical expertise will reside within the Computing Department
P dedicating mainframe and minicomputers to specific applications will become common practice
Q obtaining turnkey systems will become a common solution to specific end user needs
R the costs of modifying turnkey systems to fit organisational needs will greatly reduce their use
S the need for systems integration will require that many turnkey applications and dedicated systems be returned to central installation
T end-user computing will generate a greater need for large central mainframes
U most work will be performed on powerful workstations rather than mainframes
V organisations will obtain their equipment from one or very few vendors
W as new equipment is adopted, older equipment will be increasingly handed-down within the organisation, thereby expanding access to computing
X vendor maintenance and support will outweigh hardware performance as a purchase criterion
Y user-friendly operating systems will be favoured over those which are technically superior
Z ensuring system compatibility will be a major responsibility of the computing department

APPENDIX B

THE FUTURE OF INFORMATION SYSTEMS QUESTIONS
ACIR CLASSIFICATIONS 4 - 6

A local government's use of bureaux will be negligible
B local government will be increasingly pressured to participate in State-wide information systems
C maintaining core administrative computing (eg finance, revenue collection, personnel/payroll systems etc)
D computing use will be expanded into the functional areas not currently involved in computing
E systems integration will be the primary goal of systems expansion
F systems will be increasingly adapted or developed to meet individual officer's end user needs
G end user computing growth will include personnel in all the organisation's functional areas
H end-user understanding of computing and its uses will increase substantially
I obtaining turnkey systems will become a common solution to specific end user needs
J organisations will obtain their equipment from one or very few vendors
K hardware maintenance support will NOT be a problem in the future
L software maintenance support will NOT be a problem in the future
M software availability will NOT be a problem in the future
N local authorities will spend a greater proportion of their budget on computing
O user-friendly operating systems will be favoured over those which are technically superior