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Executive Computing: A Benefit Matrix

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Abstract

Executive computing can have a major impact on the nature of executive work and the way that organisations function. This paper presents an exploratory study of current practices and business benefits of executive computing in Australia. The first aim of this research was to explore how executives rank executive computing benefits. The second aim was to see how executive computing benefits crosstabulate and correlate with organisational factors, such as, executive position, executive computer access, formal and in-house training. Results showed executives felt that the EIS provides more timely and accurate information, helps to improve the presentation of data and aids executive decision making.

Obstacles to Executive Computing

In Australia, Executive Information Systems(EIS) are accepted as one of the crucial applications of the 1990s (Barth 1995), but EIS implementations have very high rates of failure (Daneshgar 1993). According to Thierauf (1991) failure of technology has been common throughout IS history with every major innovation starting out with a lot of hype and expectation. There could be a number of obstacles in implementing an EIS: managerial resistance; executive apathy; high costs; lack of time and poor management. Thierauf (1991) emphasised that resistance from management who feel threatened by what they perceive as a radical change in the way the company's information is shared and exchanged can be a major obstacle to EIS. Thierauf (1991) suggests several legitimate reasons for executive resistance. These include; extra work load with no extra benefits to the executive, misinterpreting of raw data without someone to put it in context for them and middle level managers worry that top level executives will use the system to perform their roles.

A Benefit Matrix

Burkan (1991) suggests that the benefits of EIS will enhance productivity and efficiency, save staff time and eliminate manual reporting. It is a value-added tool providing executives with new capabilities. More importantly, it creates a new source of knowledge that enables the company to enhance its performance and provide better service to its customers. According to Pallar & Laska (1990), executives need an EIS to meet their strategic information needs by integrating data from many incompatible sources into easy-to-find, easy-to-use, up-to-date information. Iyer & Aronson (1995) used optimal clustering to develop five categories of EIS benefits. These include information enrichment, environmental scanning, executives' effectiveness, strategic objectives, and economic factors. Each benefit is in the executive computing benefits matrix (see Table 1).

Table 1: Executive Computing Benefits Matrix

	Benefits	Indicative Reference
1	Strategic Objectives	Barber et. Al. 1993; Iyer 1995; Pallar et. al. 1990;Reardon 1995
2	Cost Saving	Barber 1993; Burkan 1991; Price 1996;Van-den 1996;Conforto 1995
3	Flexible Information	Barber et. Al. 1993; Iyer 1995; Pallar et. al. 1990; Greenberg 1996
4	Increased Productivity	Barber et. al. 1993; Conforto 1995
5	Executive Effectiveness	Barber et. Al. 1993; Iyer 995; Meneely et. Al. 1994

6	Value Added Tool	Burkan 1991
7	Environmental Scanning	Iyer 1995; Van-den 1996

Research Aims & Method

The research aims explored the benefits likely to accrue from the use of executive computing, and if these benefits correlate with organisational factors. The research method chosen was survey questionnaire. Since our aim was to establish a baseline of knowledge about current benefits of EIS in Australian business, a field study was required. The survey was cross-sectional and primarily descriptive and through the use of questionnaire ascertained executives' satisfaction with aspects of EIS. User satisfaction with information systems has been widely used in information systems research with Edwards (1993) commenting of its importance as an enabler for inter-study comparison. Benard & Satir (1993) also see user satisfaction as a useful assessment of system effectiveness.

The Sample

The sample for the survey was from an Australian wide database of organisations. Sampling used a systematic stratified method with industry sector, organisational size and Australian State being the main groupings.

Assumption Testing

The Shapiro-Wilks and K-S lillefor's statistic were used to confirm normality. These indicated that normality could not be assumed and therefore non-parametric statistics were used. The Spearman's rank-order correlation (SPSS) ascertained any relation between the executive computing benefits and organisational factors. To measure the internal validity of the grouped executive computing benefit variables, an alpha coefficient (Cronbachs) of crosstabulation reliability was calculated. The value ranged from =.6675 to =.7951 and allowed us to assume that the grouped executive computing benefits were internally valid.

Results

Executive Computing Benefits & Grouped Executive Benefits by Frequency, Mean and Standard Deviation.

Table 2 : Frequency by Percent

Benefit	Agree %	Mean	SD
Information Enrichment	52.0	2.25	.70
Timely Information	79.0	1.94	.81
Accurate Information	41.0	2.63	.82
Additional information	46.0	2.56	1.03
Grant Faster Access	42.0	1.86	.82
Provide Relevant Information	50.0	2.31	.78
Environmental Scanning	49.0	2.48	.85
External Data	30.0	2.67	1.48
Historical Information	65.0	2.27	1.07
Current Information	83.0	1.90	.83
Competitive Data	38.0	2.83	1.12
Environmental Scanning	29.0	2.69	1.15

Executives' Effectiveness	66.0	2.31	.80
Save Time	66.0	1.09	.99
Data Presentation	75.0	2.23	.95
Improves Communication	57.0	2.35	1.19
Improves Performance	59.0	2.29	.80
Strategic Objectives	54.0	2.72	1.59
Decision Making	69.0	2.06	.95
Strategic Planning	57.0	2.38	1.02
Understands Problem	48.0	2.65	1.12
Alternative Approaches	44.0	2.92	1.67
Economic Issues	33.0	2.73	.79
Cost Saving	30.0	2.67	1.02
Reduce Paper Work	42.0	2.54	1.01
Augment Quality Programs	41.0	2.35	1.10
Initiate Responsiveness	28.0	2.98	1.21
Supports Org Downsizing	23.0	2.85	1.24

The variables *current information* (83%), *timely information* (79%), *data presentation* (75%), and *decision making* (69%) all showed high levels of executive agreement. Findings showed that executives rank Executive Effectiveness benefits first (66%), the Strategic Objectives ranked second (54%), and Information Enrichment third (52%). Findings show that executives placed more importance on *faster information* (=1.86), *timely information* (=1.94) and *save time* (=1.09) with *accurate information* having least agreement (=2.63). Executives placed more importance on Current Information (=1.90) than all other Environmental variables. The low standard deviation for Current (=.83) shows a tight agreement among executives.

Executive Benefits Crosstabulated by organisational factors

Executives who had undergone in-house training see *save time* (69%), *data presentation* (84%), *improves communication* (61%) and *improves performance* (64%) as more important than the executives who have not received in-house training. Executives who had not undergone in-house training rank *alternative approaches* (58%) as more important than those who have had in-house training. Findings showed that access to the information system had a moderate correlation with EIS variables *timely information* (rs=.3563) and *environmental scanning* (rs=.3506). Formal training has a moderate negative correlation with *faster information* (rs=-.2891), *current information* (rs=-.3255), *paper* (rs=-.3528) and a moderate positive correlation with *Downsizing* (rs=.3888).

Discussion

Information Enrichment

Timely information was considered important by all executives with executives lower in the organisation recording greater importance. This was the benefit that received the strongest support within the group. *Accurate* and *relevant* information was somewhat neutral with *faster* information receiving the strongest negative ranking. This portrays the executive needing information before the decision event regardless whether the information is accurate, relevant, or fully featured. Further, the result showed that other benefits like *accurate* and *additional* are considered equally important by executives at all levels in the organisation. The results also showed that executives who access the information system more often rank *timely, accurate,* and *additional* information highly. Executives that have undergone formal computer training rank the information enrichment EIS benefit lower than those who have not received formal training. This could be interpreted as formally trained executives not being so "dazzled" by the enhanced functionality of EIS. In-house training does not seem to affect the executives ranking of EIS benefits. Some further analysis of the cross over between formal and informal groups would be necessary.

Environmental Scanning

Executives see *historical* and *current* information from the EIS as crucial. Information concerned with *scanning* the business environment was somewhat neutral. This can be construed as executives desiring access to information that may be "locked away" in older information systems. This issue touches upon the burgeoning area of data warehousing. The *external* EIS benefits ranked very highly by executives lower down in the organisation. This goes against accepted management trends that suggest that CEOs need to access external information more often than lower level executives. This could be explained by the advent and proliferation of external information via the Internet. Executives that access information systems on a regular basis rate *external* information and *environmental scanning* as being important. This could be interpreted by viewing "ad-hoc" executive users accessing internal preformatted reports rather than external scanning of information. Formal and in-house training had no effect upon *environmental scanning*.

Executives' Effectiveness

All elements within the executive effectiveness grouping were strongly supported with *data presentation* predominate. This reinforces the notion that the EIS is tailored to the executive as an individual work tool and executives see great value in the EIS improving their roles and effectiveness by saving time and aiding communication within the organsiation. CEO level executives rate the *save time* and *data presentation* benefits higher than executives lower down in the organisation. This could be interpreted by seeing CEO's as being busy thereby having time constraints and being involved in conducting presentations. Executives who use computers daily seem to place more importance on all of the Effectiveness variables. This is interpreted as the "computer smart" executive being in tune with the capabilities of the EIS.

Strategic Objectives

The EIS benefits that aid the executive in decision making all received good support. This theme sees the EIS as a decision support tool and has the potential to turn executives into more efficient and effective decision makers by providing them with *timely, additional* and *relevant* information. This also has an implication for the organisation that is flattening and/or downsizing. The flattened organisation will require greater spread of strategic decision making and access and knowledge of EIS may aid this process. CEO position did not seem to have a significant effect upon the strategic group of EIS benefits except for the *decision* benefit. Executives lower down in the organisation see EIS aiding decision making as being more important than CEO's. This could indicate the growing importance of organisational systems and the information they provide in aiding decision making at all levels in the management structure.

Economic Issues

This EIS benefit ranked last by executives. *Cost saving* was considered more important by executives lower down in the organisation. Formal and in-house training had no effect on this group of benefits with the exception of the *downsizing* variable. There is a moderate positive correlation between training and the use of the EIS with the *downsizing* benefits. This can be explained when we view the use of information systems to streamline and automate organisational functions. Formal information systems training would promote these ideas, and the advent of outsourcing and business process redesign would complement this perception.

Conclusion & Further Research

Executives ranked computing benefits into three levels. There is also some evidence of relationships between the ranking of the benefits and organisational factors such as, computer access and training. There are three potential areas for further research. (1). The use of objective measures to further explore executive benefit rankings. (2). Exploration of causal relationships between executive computing benefits and organisational factors. (3). Exploration of the evolving nature of benefit variables.

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