The effect of I.T. on staff perceptions: Observed differences between the outcomes of studies conducted within the maintenance management environment in Australia

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Abstract

The general aim of this study was to compare outcomes from the studies entitled, "Analysis of Phenomenological perceptions of effectiveness of information technology in computerised maintenance management" (Clarke and Clarke 1999), "Effectiveness of I.T. in computerised maintenance management: a longitudinal study of the analysis of phenomenological perceptions"(Clarke 2000), "Perceptions of the effect of I.T. on training, human relations and productivity as a function of position, age, experience and gender" (Clarke and Clarke 2001) and "A longitudinal study into perceptions of the effect of I.T. on training, human relations and productivity in the construction industry as a function of position, age, experience and gender" (Clarke and Heathcote 2001). The framework technique developed in these studies was used to identify trends in perceptions of such fundamental facets as efficiency of training and information technology, the effect of information technology on human relations within the workplace, the perceived impact of information technology on the efficiency of occupational performance, as a function of position (within the organisation), age, experience and gender. The empirical data was collected, over time, through structured interviews within a large public sector asset management organisation. The data was collated and examined under categories of training, human relations and productivity as a function of position, age, experience and gender. Results obtained from these studies by analysis through t-tests between management and support staff, younger and older, inexperienced and experienced together with female and male staff revealed that all groups perceived Information Technology (IT) as beneficial in terms of training, human relations and both qualitative and quantitative outcomes. The level of satisfaction observed concurs with a multiplicity of previous researchers findings regarding I.T.'s benefits in terms of other quantitative and qualitative outcomes, in industry. The observed changes in perception of the various groups, over time, are investigated and discussed with a focus on probable causes. Further research is suggested into the interaction between perceptions and outcomes. In particular staff attribution styles are briefly explored as an area warranting further investigation.

KEYWORDS: information technology (IT); staff; construction; effectiveness; management; perception

1 Introduction

With the seemingly never ending advances in technology, it would appear that work environments in general will be undergoing a period of constant transformation. The fifth paradigm shift identified in the previous papers Mathews 1994, Clarke and Clarke 1999, Clarke 2000, Clarke and Clarke 2001 and Clarke and Heathcote 2001 appears to be a process the work environment is still undergoing. The paradigm shift is continually transforming a plethora of existing organizations within the building construction industry.

From an organizational psychology perspective, it is interesting to consider the implications of these continual changes on factors within a maintenance management environment that has undergone a change of I.T systems within the past year. Mathews purports that most programs of organizational change end up in failures. I.T is considered by researchers and practitioners to be extremely useful in terms of increasing both qualitative and quantitative outcomes (Mathews 1994).

In the previous studies, "Analysis of Phenomenological perceptions of effectiveness of information technology in computerised maintenance management" (Clarke and Clarke 1999), "Effectiveness of I.T. in computerised maintenance management: a longitudinal study of the analysis of phenomenological perceptions"(Clarke 2000), "Perceptions of the effect of I.T. on training, human relations and productivity as a function of position, age, experience and gender" (Clarke and Clarke 2001) and "A longitudinal study into perceptions of the effect of I.T. on training, human relations and productivity in the construction industry as a function of position, age, experience and gender" (Clarke and Heathcote 2001) the data was collected. Chisthi, Martin and Jacoby claim that a "negative effect on the mental health and morale of employees was reported by a noticeable percentage of respondents" (Chisthi et al 1997 pp. 11). This claim supports the 'resistance to change' theories because organisational change may force managers and support staff alike to move from their comfort zone and may impact on their mental health (Lansbury 1986). Data will be analysed in the present study to assess the impact of technological change in terms of factors previously Investigated in the studies by Clarke and Clarke 1999, Clarke 2000, Clarke and Clarke 2001 and Clarke and Heathcote 2001.

2 Method

The data utilized in this study was collected during two previous studies. The two data sets were tabulated to facilitate analysis by t-tests to permit observations of differences, similarities and changes.

3 Results

The results were tabulated and are shown in tables: 1p, 1a, 1e, 1g and 2p, 2a, 2e, 2g.

description		*t*	*p*	*Mean*	*scores*
AGE				younger	older
Training	Existing IT	2.105	<0.05	3.571	2.688
Training	New IT	1.595	>0.05	3.429	2.875
Human resources	Office morale	0.649	>0.05	3.429	3.625
Human resources	Control	2.5	<0.05	3.714	3.375
Human resources	Fear of redundancy	2.097	<0.05	4.143	3.438
Productivity	Quality of service	0.527	>0.05	4	4.25
Productivity	Level of output	1.163	>0.05	3.857	4.375

Table 1a
Initial data set results as differentiated by age

description		*t*	*p*	*Mean*	*scores*
EXPERIENCE				inexp	experienced
Training	Existing IT	.417	>0.05	3	3.182
Training	New IT	.262	>0.05	3	3.091
Human resources	Office morale	.98	>0.05	3.333	3.636
Human resources	Control	3.394	<0.05	3.333	4.272
Human resources	Fear of redundancy	.539	>0.05	3.667	3.833
Productivity	Quality of service	2.129	<0.05	3.353	4.292
Productivity	Level of output	2.204	<0.05	3.332	4.334

Table 1e
Initial data set results as differentiated by experience

description		*t*	*P*	*Mean*	*scores*
GENDER				female	male
Training	Existing IT	1.387	>0.05	2.727	3.333
Training	New IT	1.387	>0.05	2.727	3.333
Human resources	Office morale	4.588	<0.05	2.667	3.75
Human resources	Control	6.114	<0.05	3	4.375
Human resources	Fear of redundancy	1.015	>0.05	4	3.667
Productivity	Quality of service	7.272	<0.05	2.332	4.667
Productivity	Level of output	4.993	<0.05	2.667	4.5

Table 1g
Initial data set results as differentiated by gender

3 Discussion

A summary of these results revealed that there was a higher perceived level of satisfaction with IT by managers as opposed to support staff but that this level of satisfaction was reduced substantially after the new I.T. system was introduced. Similarly younger staff was slightly more satisfied with I.T and there was a 13% reduction in this level of acceptance with the new

description		*t*	*p*	*Mean*	*scores*
POSITION				manager	support
Training	Existing IT	.217	>0.05	2.935	3
Training	New IT	.194	>0.05	2.9	3
Human resources	Office morale	.201	>0.05	3	2.95
Human resources	Control	2.151	<0.05	4	3.44
Human resources	Fear of redundancy	.943	>0.05	3.1	3.9
Productivity	Quality of service	.384	>0.05	3.726	3.6
Productivity	Level of output	.627	>0.05	3.8	3.55

Table 2p

Second data set results as differentiated by position

description		*t*	*p*	*Mean*	*scores*
AGE				younger	older
Training	Existing IT	.715	<0.05	3.429	2.625
Training	New IT	.065	>0.05	2.955	2.935
Human resources	Office morale	.227	>0.05	2.913	2.969
Human resources	Control	.986	>0.05	3.478	3.719
Human resources	Fear of redundancy	1.183	>0.05	3.522	3.188
Productivity	Quality of service	.739	>0.05	3.522	3.75
Productivity	Level of output	.181	>0.05	3.565	3.625

Table 2a

Second data set results as differentiated by age

description		*t*	*p*	*Mean*	*scores*
EXPERIENCE				inexp	experienced
Training	Existing IT	1.666	>0.05	3.028	2.526
Training	New IT	.162	>0.05	2.944	2.895
Human resources	Office morale	.099	>0.05	2.972	2.947
Human resources	Control	.485	>0.05	3.611	3.737
Human resources	Fear of redundancy	.519	>0.05	3.361	3.211
Productivity	Quality of service	1.33	>0.05	3.694	3.263
Productivity	Level of output	.329	>0.05	3.639	3.526

Table 2e

Second data set results as differentiated by experience

system. Average mean scores, as differentiated by experience, revealed that between the first within the work environment being experienced generally by the workforce. Finally male staff members were more satisfied with I.T. than female staff members, as indicated by the average mean scores by males being higher in 84% of the variables, over both data sets. Trends in the perceptions of the effectiveness of I.T. in the maintenance management environment in Australia have been observed to change in the time between the collection of

description		*t*	*P*	*Mean*	*scores*
GENDER				female	male
Training	Existing IT	.783	>0.05	3	2.765
Training	New IT	.49	>0.05	2.857	3
Human resources	Office morale	2.165	<0.05	2.619	3.118
Human resources	Control	2.014	<0.05	3.286	3.794
Human resources	Fear of redundancy	.677	>0.05	3.19	3.382
Productivity	Quality of service	1.294	>0.05	3.429	3.824
Productivity	Level of output	1.308	>0.05	3.333	3.765

Table 2g
Second data set results as differentiated by gender

these two data sets, indicating a reduction in the perceived level of satisfaction with training for existing I.T., office morale and control in the work environment.

In conclusion, it is evident from the present research that the maintenance management environment, while perhaps more efficient quantitatively, has yet to come to terms with the impact on both customer support and managerial staff of implementing new I.T. systems. It would seem that organizational factors are not being adequately addressed within this environment, perhaps as a consequence on the focus on technology as "the answer" at the expense of the staff involved in enabling this technology to operate. As an organizational psychology issue, the researchers argue that it may be extremely beneficial to focus on two specific areas, the first of these is an issue far broader than the specific environment focused upon in these studies. Within the construction industry in general, an examination of the impact of I.T. on Customer Relationship Management (CRM) policy and effectiveness must be carried out as a function of interaction between staff and the I.T. systems implemented. The present researchers are designing training programs and evaluation best practice in the area. Secondly, more specific psychological characteristics of staff must be researched. The social cognitive processes of staff in relation to how they view I.T. must be examined, initially. This could be correlated with Rotter's (1916) personality typology looking at attribution style as either internal or external locus of control. These specific psychological factors, amongst numerous others should be examined within this environment. The researchers argue that given the findings of the present study, more attention needs to be given to the impact of I.T. on staff. Examining the construction environment and I.T. in the light of organizational psychological principles can do this. Implications of this proposed necessary further research are argued to benefit staff satisfaction levels and consequently productivity levels and Customer Relationship Management (CRM) in general.

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