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End users' perceptions concerning computer applications implemented in broadcast stations

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ABSTRACT

In an era of limited resources, organizations must scrutinize every purchase carefully. A critical and sometimes very expensive purchase is for computer hardware and software. The reasons for the purchase are generally given as productivity improvements or personnel reductions. However, assessment of why computer applications are really implemented from the end users' perspective has not been reported. In order to answer questions to justify expenditures it would be helpful to understand how end users perceive the reasons for implementation of computer applications in their stations. To this end a questionnaire was sent to all broadcast radio and TV stations in the State of Wisconsin. The end users (station managers) were requested to identify reasons for present computer application implementations and areas of implementations for future use. The results of this study compare type of computer being used and station characteristics with a checklist of reasons for computer application implementations in the broadcast industry. This research begins the identification of other factors that are justifiable reasons for computer application implementations. In doing this, end users can broaden the how, why, what, and when of their computer application purchases. We all believe that the computer is a tool to help us do our jobs better, but what does that mean and how can we document these feelings? Or as Jon Van (1991) and G. P. Zachary (1991) have stated, are we really getting what we expected from the computer applications we have implemented? This research study does not pretend to completely answer these or other questions in this area. However, it is a beginning and valuable research that needs to be augmented.

INTRODUCTION

In an era of limited resources, organizations must scrutinize every purchase carefully. A critical and sometimes very expensive purchase is for computer hardware and software. The reasons for the purchase are generally given as productivity improvements or personnel reductions. However, assessment of why computer applications are really implemented from the end users' perspective has not been reported. In order to answer questions to justify expenditures it would be helpful to understand how end users perceive the reasons for implementation of

computer applications in their stations. To this end a questionnaire was sent to all broadcast radio and TV stations in the State of Wisconsin. This exploratory study asked station characteristics--age, output power, station type, number of employees (full-time, part-time, and interns) and the station format. Additionally, the station managers (end users) were requested to identify reasons for present computer application implementations and areas of implementations for future use. The checklist was the result of open-ended questions given to a pilot study group. Additionally, the users' personal productivity with the implementation of computerized applications has been questioned (Mossberg, 1991; Powledge, 1991; Zachary, 1991). If computer technology does not improve our personal productivity and/or quality, then why do we implement it (Van, 1991)? With limited resources and tight economic times, every expense must be carefully evaluated. Have we been swayed by the promises from computerized applications and ignored the real issues?

At this point in our research, it was not feasible to define a productivity measure for computerized application usage in broadcast stations. The researchers strongly felt that this area of research needs further exploration and description. Given the rich potential of computer utilization in the broadcast environment, this study was implemented to profile the computer usage of broadcast stations in Wisconsin. The study had two prime objectives. First, what computerized applications were broadcast stations using? How could we classify these and tabulate the extent of the influence of computer technology and provide a benchmark for future research? Second, why did broadcast stations implement the computer applications they are using or plan to use in the next twelve months?

Results from this study will allow proposers for computer applications purchases to document why the computer application is really important to the organization. This study also explores the driving factors behind some of the implementations such as employee or station type.

This research is important in the broadcast field, as well, since nowhere has the invasion of computers into American industry become more consistent and pervasive than in the broadcasting industry. Today, many jobs in radio and television stations use computers to assist or replace on- and off-air tasks. The examples are many and varied. They range from production driven computer tasks, including engineering activities, to heavily assisting in the business and traffic activities of a broadcast facility. Computers capture AP wire stories and allow them to be rewritten, edited and reprinted electronically; additionally, they can be transferred to the teleprompter via a computer program (Keristead, 1989). Computers can be used to make the news more immediate and accurate; they can go into the battlefield, as evidenced with Persian Gulf news or on a remote assignment with correspondents (Hume, 1989). The ongoing ratings battles between competing television stations has made the demand for computer-generated graphic logos and quality images a more consistently utilized application (Miskowich, 1988). Even the engineering jobs, such as locating and placing broadcast equipment and towers, have been made easier and more accurate through computer aided design (Black, 1988). Last year, Ted Turner's TBS (Turner Broadcast Station) used custom-designed computer programs to automate the videotape management of events as well as the hiring, assigning and compensation of thousands of temporary employees working at the second Goodwill Games in Seattle (Higgins & Morrissey,

1990). Computers have been utilized in the broadcast industry assisting in tasks as diverse as determining the play order of songs and spot commercials on a radio station to the editing of different television shots in the recent release of Nelson Mandela in Africa (Mitchell, 1988). Despite the plethora of computer applications, no published literature has identified and examined the nature and quantity of computer applications in present American broadcast facilities.

THE STUDY

The authors mailed questionnaires to 255 radio stations and 41 television stations in the state of Wisconsin. The questionnaire was the culmination of two pilot studies. One pilot study queried 13 radio station engineers in the Fox Valley (Appleton, Green Bay and Oshkosh, Wisconsin). A second follow-up pilot was sent to the Broadcast Education Association State Broadcast Association Executive Directors, which represent 50 states and Puerto Rico. As a result of these two pilot studies, a revised and restructured questionnaire was developed. The survey sought to address the questions of: (1) why were computer applications implemented in broadcast stations and (2) what applications are being used today and being planned for in the near future.

RESULTS

The results of this descriptive study provided the following findings. The profile of the one hundred and thirty-five respondents included: fifty-two (38.5%) AM radio stations, sixty-five (48.1%) FM radio stations, and eighteen (13.3%) TV stations. As part of the general station data the participants reported their target audience and format, station affiliations if any, age of the station, output power, station class, number full-time employees, part-time employees and the types of computers at the station.

The output power was self-reported on the questionnaire and verified from the Broadcasting/Cable Yearbook 1990. The results were then grouped into four relatively equal categories. Category A was for power less than 0.7 KW. This category included 34 responding stations. Thirty-four stations were categorized as a B which has power between 0.7 and 1.0 KW. Twenty-eight stations were between 1.0 and 3.6 KW of power, identified as category C. A total of thirty-nine stations had power greater than 3.6 KW.

For analysis purposes the station age was grouped into three categories, young (less than 19 years of age), middle (20 to 35 years of age) and older (over 36 years of age). The age of the station is the actual length of time the broadcast license has been in effect for this location. Changes in ownership, call letters, format and affiliations were not considered for this initial study. Forty-five stations were categorized as young, forty-seven as middle, and forty-three as old.

The stations self-reported the number of full-time and part-time persons employed. These results were then grouped into equal categories for analysis. The trend is to use more part-time employees, thereby making this factor a potential driving force in computer utilization at the station (Thorpe & Schuldt, 1992).

Computer utilization in each station was determined by the stations reporting the different categories in which they are using computer applications to facilitate the functional tasks in the station. The sophistication, complexity, or evolution of computer applications was not discernible from this study. Additional research being done into classification of the types of computer applications by cost, function, complexity, and end-user sophistication will enhance future surveys in this field.

The participants of the survey were asked to check all the factors listed that explained their perception of why the application was implemented. The list was derived from the pilot studies answers to open-ended questions. The list included the following options: (1) improve productivity; (2) reduce person hour costs; (3) management control; (4) improve quality; (5) expand station capabilities; (6) create new services; (7) improve accuracy; (8) remain state-of-the-art; (9) save money; (10) improve efficiency; (11) improve profit; (12) time management; and (13) other (please specify). The responses given for other were: (1) to run station automation systems; (2) accounts receivable management; (3) run digital packages; and (4) to integrate multiple tasks.

Further station data included the type of computers used by the stations. Nine respondents were using no computers at their stations. One hundred and five (77.8%) of the stations use IBM or compatible computers, twenty-five (18.5%) stations use the Apple, Macintosh, or compatible computers, three stations use Amiga computers and twenty-four (17.8%) of the stations were using mini or mainframe computers.

DISCUSSION OF THE RESULTS

Since this is an exploratory study, significance was taken at the $\alpha = 0.10$ level and marginally significant was at $\alpha = 0.20$ level. The chi square statistics were analyzed using a statistical package called ABSTAT by Anderson Bell.

The type of the station - AM radio, FM radio or TV - was only significant with the management control reason. The results of the chi square test for type and the management control reason showed that for the radio stations it was not significant but for the TV stations this is a significant reason.

Those stations using IBM or compatible computers were more likely to check numerous reasons for implementing computer applications than those stations not using IBMs or compatibles. The reasons analyzed as significant were: to improve productivity; management control; improve quality; expand station capabilities; create new services; remain state-of-the-art; save money; improve efficiency; and improve profit. Marginally significant was the reason to reduce person hour costs. See Table 2 for the results from the analysis. Those stations using a mini or mainframe computer had similar results as the IBM users except to improve productivity and to improve efficiency were not statistically significant. There was not significance for Amiga or Apple users and the given reasons. This will be discussed in the conclusions section as a possible bias of the survey.

The output power of the station showed a marginal significance for the implementation reason to improve profit. The higher the output power the greater the probability the participant would select the reason profit improvement for the application implementation. This result needs further study to rationalize, given the highly competitive profit margins in today's oversaturated market.

The older stations (36-66 years) significantly correlated with a greater number of future applications being planned for implementation. Stations 20 to 66 years old were marginally significant in selecting the implementation reason to remain state-of-the-art; however, young (0-19 years) and older (36-66 years) stations were more likely (marginally significant) to select the implementation reasons to improve profit.

Those stations with five or more current computer applications are most likely (significantly) to select all of the given reasons - productivity improvement, person-hour cost reduction, management control, quality improvement, station capability expansion, new service creations, accuracy improvement, remaining state-of-the-art, saving money, efficiency improvement, profit improvement and time management - for the implementations. It appears that the stations have added applications to fill these voids in their facilities.

Stations that are planning on implementing several computer applications in the near future were more likely to select productivity improvement, person-hour cost reductions, creating new services, and profit improvement as the significant reasons for computer application implementations. Marginally significant were the reasons of management control, accuracy improvement, and saving money. Interestingly, those stations with more current applications (5-9) are looking at adding more future applications. Whereas those who only have one or two applications now are not looking at making serious change.

The greater the number of full-time employees, the more likely (significant) the perception that the reasons for computer application implementations are: productivity improvement; management control; station capability expansion; accuracy improvement; remaining state-of-the-art; saving money; efficiency improvement; and marginally significant for profit improvement. See Table 1 for a summary of the probabilities. Finally, stations in the category of 11-18 full-time employees were more likely to select "other" as a reason for computer application implementation.

The number of part-time employees is significantly correlated with the greater output power, older age, and greater the number of full-time employees. The greater the number of part-time employees (5-50) were more likely to select station capability expansion, accuracy improvement, saving money, and profit improvement for significant reasons for the implementations. The "other" category was significant but it was a low number (0-2) of part-time employees that were more likely to select this reason. The other reasons given by the participants were listed above in the results section. The greater the number of part-time employees compared to productivity and efficiency improvement was marginally significant as noted in Table 1.

Table 1. Correlation Matrix for Independent Variables Compared to the Implementation Reasons

<u>Reasons</u>	<u>Employees</u>		<u>Output Power</u>	<u>Current Apps</u>	<u>Future Apps</u>	<u>Station Age</u>	<u>Station Type</u>
	<u>Full</u>	<u>Part</u>					
Productivity Improvement	0.0786*	0.1863#	0.7143	0.0002*	0.0812*	0.8433	0.5976
Reduce Person-Hour Costs	0.7871	0.6517	0.8799	0.0733*	0.0478*	0.4781	0.5212
Management Control	0.0005*	0.6084	0.4879	0.0007*	0.1784#	0.5894	0.0858*
Quality Improvement	0.5812	0.2590	0.9723	0.0000*	0.2662	0.2142	0.3992
Expand Station Capabilities	0.0006*	0.0403*	0.6923	0.0000*	0.2058	0.7643	0.6722
Create New Services	0.0263*	0.0224*	0.5115	0.0000*	0.0139*	0.5987	0.7796
Accuracy Improvement	0.3659	0.2795	0.7847	0.0054*	0.1571#	0.9901	0.5080
Remain State-of-the-Art	0.0002*	0.3675	0.3147	0.0030*	0.5596	0.1110#	0.3953
Save Money	0.0007	0.0415*	0.7389	0.0000*	0.1362#	0.7346	0.7602
Efficiency Improvement	0.0004*	0.1942#	0.8856	0.0000*	0.7300	0.5551	0.4118
Profit Improvement	0.1293#	0.0845*	0.1457#	0.0052*	0.0312*	0.1957#	0.8916
Time Management	0.7590	0.6956	0.9595	0.0516	0.5013	0.3129	0.8550
Other	0.0214*	0.0229*	0.2577	0.4125	0.5080	0.3059	0.3716

* significant at the alpha = .10 level # significant at the alpha = .20 level Apps = computer applications

Table 2. Correlation Matrix for Type of Computer Compared to the Implementation Reasons

Reasons	Type of Computer Used					
	None	IBM	Amiga	Mini Apple	Mainframe	Other
Number Using	9	105	3	25	24	24
Productivity Improvement	0.0000*	0.0000*	0.3847	0.8196	0.8982	0.1032*
Reduce Person-Hour Costs	0.2541	0.1040*	0.5561	0.6464	0.8784	0.7475
Management Control	0.0119*	0.0006*	0.8861	0.6626	0.1162#	0.5044
Quality Improvement	0.0012*	0.0000	0.8034	0.9142	0.0287*	0.7122
Expand Station Capabilities	0.0051*	0.0011*	0.4177	0.5508	0.0706*	0.6707
Create New Services	0.1987#	0.0308*	0.7932	0.6892	0.0328*	0.9953
Accuracy Improvement	0.0003*	0.2365	0.6190	0.3547	0.4270	0.0230*
Remain State-of-the-Art	0.0905*	0.0192*	0.3397	0.8491	0.0230*	0.9960
Save Money	0.0673*	0.0010*	0.5357	0.3889	0.0946*	0.4738
Efficiency Improvement	0.0000*	0.0006*	0.7512	0.7527	0.2151	0.4741
Profit Improvement	0.2285	0.0468*	0.8373	0.9442	0.0034*	0.8503
Time Management	0.0105*	0.5337	0.9068	0.2083	0.2994	0.8923
Other	0.8900	0.2132	0.4825	0.3001	0.9281	0.9281

* significant at the alpha = .10 level

significant at the alpha = .20 level

CONCLUSIONS

This paper reports on the initial descriptive study of computer utilization in Wisconsin radio and television stations. The station profiles are not intended to be all inclusive but are given as the first step in identifying the driving factors for computer utilization in broadcast stations.

Overall, the reasons given by the participants make intuitive sense concerning the station end-users' perceptions concerning computer application implementations. Additional research is needed to strengthen the claim that the stated reasons and the correlations with station characteristics are as significant as it appears.

A possible problem with the study concerned the overwhelming response for stations using IBMs or compatibles. This could have been a bias from the pilot studies, or from the comparative low numbers for Amiga and Apple users, or we (the authors and end-users) have not correctly identified the real reasons for implementing applications in the Amiga or Apple environment. As the computer environments merge and the platforms become meaningless to end users, this may not be an indicative problem with the survey.

As this systematic program of research continues, a better categorization of the number, description and value to the organization of the computer applications needs to be developed. This will, however, require assistance from the broadcast industry to help clearly define computer applications categories and their importance to the station.

In sum, how does this research help the end user? It begins the identification of other factors that are justifiable reasons for computer application implementations. In doing this, end users can broaden the how, why, what, and when of their computer application purchases. We all believe that the computer is a tool to help us do our jobs better, but what does that mean and how can we document these feelings? Or as Jon Van (1991) and G. P. Zachary (1991) have stated, are we really getting what we expected from the computer applications we have implemented? This research study does not pretend to completely answer these and other questions in this area. It does state that this is a beginning step and one that needs to be expanded.

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