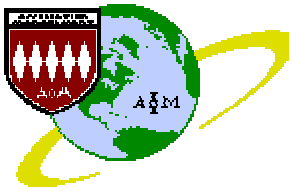

Journal of Information Technology Management

ISSN #1042-1319

A Publication of the Association of Management

INFORMATION SYSTEMS OBJECTIVES: EFFECTS OF EXPERIENCE, POSITION LEVEL, AND EDUCATION ON DEVELOPERS

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ABSTRACT

Information Systems (IS) have become critical for redesigning organizational processes, and as a result, the nature of the roles and duties of IS professionals have changed. It has become increasingly important for IS professionals to understand how the objectives of an IS relate to the organizational goals. It has been suggested that the traditional views of IS developers which emphasizes a technical orientation may be one of the factors contributing to the frequent failure of IS to meet their expectations. Thus, the purpose of the present study was to provide an updated view of how IS developers perceive the importance of different types of IS objectives. In the current investigation, the objectives of an IS were classified at the (1) System, (2) User, (3) Organizational, or (4) Strategic level and by the short-term or long-term perceived benefits. The results demonstrated that IS developers in general view objectives at the system and organizational level as more important than objectives associated with the user and strategic levels. The IS developers also viewed the short-term goals as significantly more important than the long-term goals. The views of IS developers were not affected by the amount of experience working in the IS field. However, the results indicated that IS developers with a higher organizational position tended to view the long-term benefits as more important than did developers with a lower position in the organization. In addition, the developer's level of education was associated with an increase in the perceived importance of objectives at the user and the organizational level.

INTRODUCTION

In spite of significant methodological advances and years of application experience, the development of Information Systems (IS) remains an uncertain process. While many systems development projects have been successful, many other have failed. It has been reported that up to 90% of all IS projects fail to meet their goal [6]. According to a recent study by The Standish Group, 31% of new IS projects are canceled before completion at an estimated combined cost of $81 billion [31].

Attempting to identify possible problems in the IS development process is a goal of both academicians and practitioners. Part of the responsibility for IS failure is often attributed to the IS developers [14]. It has been proposed that the views of IS developers regarding the objectives of IS may be too narrow in scope. For example, it has been suggested that IS developers are overly concerned with technical and

methodological issues [20, 24]. It has been reported that IS developers often fail to consider the effects of an IS on the user's job [20]. Studies have indicated that while user groups are generally more concerned with how the systems meets their task-related needs, IS developers are more concerned with the technical issues [13,]. Similarly, it has been suggested that IS failure is often the result of developers not understanding how the objectives of the system relate to the performance of the organization [13, 25 ,37]. IS developers are assumed to be primarily interested in the "technical validity" of the system, whereas management is more concerned with the "organizational validity" of the system [42]. Studies have also reported that IS developers need a better understanding of the fit between IS and the organization and how IS may provide organizations with competitive and strategic advantages [1, 2, 3, 37].

Although a number of articles have discussed possible shortcomings regarding the views of IS developers, there have been very few recent studies devoted to an examination of how IS developers view the goals and objectives of an IS. Apparently, it has been a number of years since a study has examined how IS developers view the objectives of IS [44]. Most of the recent studies on IS developers' views and orientations may be more appropriately considered to be case studies involving IS developers from one organization or exploratory studies providing only descriptive results based on a sample of less than thirty IS developers [14, 21, 33, 46]. Very few studies have reported the results of a large-scale investigation on IS developers' views [22, 23, 29]. Moreover, there does not appear to be any recent large-scale studies specifically devoted to how IS developers view the objectives of an IS. Since the role of IS and IS developers has changed dramatically in the past decade, the present study was conducted to provide an updated examination of how IS developers view the importance of different types of IS objectives.

Information Systems Objectives

Many articles have been devoted to a discussion of the essential objectives of an IS [35, 41, 43]. Although there may not be complete agreement regarding the prescribed objectives, it is generally agreed that as IS become more critical for the strategic operations of organizations, the objectives of IS have expanded to include both short-term and long-term objectives at all levels of the organization.

Initially, IS were simply designed to automate or quickly perform routine tasks [36]. As such, the objectives of early IS were concerned with reliability, efficiency, and system availability [15, 36]. Thus the objectives of early IS were primarily at the system level. Starting in the 1970s, the objectives of an IS were extended to include providing users with needed information. Thus, the notion that information systems should include objectives related to the users' views and the need to satisfy users was introduced [32].

More recently, the objectives of information systems have expanded to include all levels of the organization. Computers no longer simply provide the backbone of information processing for organizations. Computers are changing the fundamental ways that organizations operate [30]. Modern IS are capable of providing numerous organizational benefits including strategic and competitive advantages for the organization [3, 4, 10, 25]. Aligning IS solutions with business goals and needs as well as building the infrastructure for technology integration are becoming the top priorities for IS activities [30]. Thus, the objectives of information systems are no longer restricted to system and user level, but usually include organizational and strategic level goals as well.

In addition to classifying IS objectives by level, it is also possible to classify the objectives in terms of the time required before it becomes possible to evaluate the objective. The development and implementation of an IS can be a very long process involving a series of phases that may consist of iterations and feedback loops [12, 20, 36]. A recent study listed the following four phases with respect to IS development and implementation; (1) the need for a system should be identified and requirements drawn up, (2) the logical and physical design and building of the system has to take place, (3) the system has to be implemented, and (4) the operational system has to be maintained, updated, and reviewed over time [34]. The system development lifecycle requires a number of checks and evaluation of goals throughout all of the phases [12, 36]. Thus, the process of IS development and implementation can be considered to consist of both short-term and long-term objectives [16].

Relevance of Developers' Perceptions

While a number of studies have investigated the views of managers and users, the views of IS developers has received far less attention [29]. Thus, while much is known about the perceptions of managers and users regarding IS success, very little is know about the perceptions of IS developers.

How developers perceive the objectives of an IS is important because their views may affect the resulting IS. IS developers make a series of important decisions regarding the design and implementation of the system during the complex and unstructured process of IS development. The developers have to define, interpret, and execute IS development strategies, and in so doing they often have to rely on their own judgement [29]. The judgments and decisions made by IS developers are influenced by how they view IS success. Thus, the views of IS developers may affect how the objectives of the system are defined, as well as influence decisions related to project management and resource allocation. A problem therefore could exist if IS developers' perceptions of the objectives of IS are not consistent with the expanding role of IS in organizations.

As previously mentioned, many researchers have proposed that IS developers are primarily concerned only with the technical, or system level objectives. It has been frequently noted that the traditional role IS developers is no longer adequate [18]. IS developers need to adopt a broader perspective to fit with the new role of IS in organizations. Studies indicate that lower level IS jobs are rapidly disappearing and the requirements for IS professionals are becoming more demanding in multiple dimensions [30]. Studies have proposed that it is no longer adequate for IS professionals who are responsible for design and implementation to be competent only in technology. They must also have an in-depth understanding of business functions and needs [7]. Keen [27] points out that IS personnel must change from a "task orientation" to a "role orientation" in order to function effectively in the new business environment. With the task orientation, the task often becomes the end in itself and the IS professional can lose sight of the larger goal that the system is trying to accomplish. Thus, the research seems to clearly suggest that it is necessary for IS developers to understand the importance of IS objectives at the user, organizational, and strategic levels as well as the system level in order to effectively develop and implement successful IS projects that provide organizations with competitive advantages.

In addition, IS developers may be overly concerned with only the short-term objectives of IS. It has been noted that developers often view a system as effective or successful when it is developed, installed, and working [13]. Studies indicate that developers sometimes view their responsibilities completed once the system is installed and operating [20]. Thus, the research implies that developers are mostly concerned with the short-term goals of IS and may not be completely aware of the relevance of the long-term objectives.

Purpose of the Present Study

The goal of the present study was to provide an updated view of how IS developers perceive the importance of different types of IS objectives. The goal was not to determine how IS developers view a comprehensive list of potential objectives, but rather how IS developers view both short-term and long-term goals at each of the following four levels; system, user, organizational, and strategic. More importantly, this study compared how developers views regarding the objectives of an IS may vary depending on individual characteristics of the IS developer.

The eight objectives examined in the present study are presented in Table 1. The importance of system level objectives is rather obvious [11, 16, 20, 36]. In the short-run, a primary objective at the system level is to design a system that is reliable and bug-free. This objective can often be assessed when the system is tested and used in full scale. In the long run, the system should be easy to maintain and update. Generally to determine if the system is easy to maintain, it will be necessary for the system to be in use for a period of time. This suggests that it may be in the latter stages of the maintenance and review phase before this goal can be assessed.

Many studies have stressed the importance of user level objectives (11, 16, 20, 38]. Perhaps the main objective at the user level is to satisfy the users' demands in terms of providing timely and appropriate information in a format that can be easily used. It is possible to assess this objective following the implementation process. In the long run, however, the IS should improve the productivity of the users and managers. The assessment of this goal may not be as immediate and therefore could be considered more appropriately as a long-term objective.

The importance of organizational objectives has been noted in many studies [11, 16, 36]. At the organizational level, the system enhances the efficiency and effectiveness of the business operations [28, 39, 45], and ultimately should generate financial returns in the long run [48]. The importance of strategic objectives has been discussed in many studies [35, 42, 47]. At the strategic level, an IS should provide satisfactory service for the customers

[38, 48] and eventually enable the development of cooperative partnerships [39, 47].

Table 1

Levels of IS Objectives Classified by Short-Term and Long-term objectives

Short-term Objectives

System – Reliable (bug-free) system
User – Satisfying user needs
Organizational – Improving the effectiveness of business operations
Strategic – Improving customer service

Long-term Objectives

System – Easily maintainable system
User – Improving productivity of managers
Organizational – Generating operational benefits
Strategic – Enabling cooperative partnership

Research Hypotheses

Prior research has suggested that IS developers are overly concerned with technical issues. Thus, it was anticipated that IS developers would view objectives as the system level as more important than objectives at the user, organizational, or strategic levels. Thus the first hypothesis was as follows.

H1. The two objectives associated with the system level will be rated as more important than the objectives associated with the user, organizational, and strategic levels.

Similarly, the previously cited research suggests that IS developers are more concerned with short-term objectives. Thus, it was anticipated that IS developers would view the short-term objectives as more important than the long-term objects. Thus the second hypothesis was as follows.

H2. Each of the four short-term objectives will be rated as more important by IS developers at each of the four levels than the corresponding long-term objectives.

An addition goal of this study was to examine possible individual differences among IS developers with regard to their views on IS objectives. Not only has there been very little research regarding developers' views, there is practically nothing known about how individual characteristics of IS developers affect their perceptions of IS success. It is reasonable to conclude that how IS developers view the objectives of an IS could vary depending on a number of individual characteristics of the IS developers.

One factor that has been proposed to influence the views of IS developers is the amount experience in the IS field [49]. With more experience, an IS developer may become more aware of the larger issues with respect to the objectives of an IS [5, 9]. In addition, studies have found that less experienced IS developers are more likely to have a technical orientation than older and more experienced developers [14, 22]. Therefore, it might be expected that the amount of experience in the IS field could influence how IS developers view the objectives of an IS. It was anticipated that with more experience, IS developers would have more familiarity with the organizational goals and therefore have a better perspective on how the objectives of an IS relate to the organization's goals. Thus, hypothesis three was as follows.

H3. The more experienced IS developers will rate the long-term objectives and the non-system level objectives as more important than the less experience IS developers.

The developers' level within the organization has also been suggested as a possible source for differences in the views on IS projects [49]. Higher positions may require a broader understanding of the role of IS in the organization. For example, while a programmer needs to be technically skilled, a system analyst requires a more balanced mix of technical and organizational skills, and an IS manager needs to possess a higher level of organizational knowledge [17, 50]. Thus it is reasonable to expect that IS developers with a higher rank (such as project manager) are likely to have broader job responsibilities and are more likely to interact with management and user groups with respect to IS implementation. Thus their perspective on IS objectives may not be as limited as IS developers who are primarily concerned with project development. The present study examined the possibility of differences between the views of IS developers at different organizational ranks. The fourth hypothesis was as follows.

H4. IS developers with a higher rank will rate the long-term objectives and the non-system level objectives as more important than IS developers with a lower rank.

Several researchers have proposed that formal education and training may be a potential solution for the problem of IS developers focusing too much on only the technical and methodological issues

[2, 8, 19]. Presumably more education would provide the IS developers with a better understanding of how the objectives of an IS relate to the business operations. Thus, another individual factor examined in the present study was the IS developers' level of formal education. The fifth hypothesis tested was as follows.

H5. IS developers with more formal education will rate the long-term objectives and the non-system level objectives as more important than IS developers with less formal education.

RESEARCH METHOD

Questionnaire and Sample. Several faculty members working at a university in the mid-west validated the questionnaire by means of a pretest. The questionnaire was distributed to 21 faculty members of a CIS department, of which several provided written and oral feedback on the questionnaire. Part of the purpose of the pretest was to ensure that there was agreement among the faculty members with respect to the appropriate classification of the eight objectives by level and short and long-term duration. The questionnaire was then pilot-tested with IS developers from two local companies. The IS employees from each company were tested in small groups. They completed the questionnaire first and then provided oral feedback on the list of objectives and their classification. Based on the feedback of the pilot test, some changes were made to improve the clarity of wording and comprehension. The questionnaire used in this study appears in Appendix A. Respondents evaluated each of the eight IS objectives on a 7-point Likert-type scale ranging from (1) not important to (7) very important.

The questionnaires were distributed to IS developers working in one of seven different organizations. This was generally a convenience sample selected primarily because of the existence of personal contacts with the firms. The questionnaires were mailed to a contact person who distributed the surveys to IS personnel who were willing to participate in the study. No information was available regarding the proportion of IS personnel that refused to participate in the study. However, in each case, the contact person indicated that almost all IS developers who were given a survey completed the instrument. This was verified by the number of completed surveys returned versus the number of returned surveys that were not distributed. All 110 of the surveys returned provided useable data. The number of surveys returned ranged from six from one organization to 26 IS developers in another organization.

Companies. The type of organizations involved in the current survey included: two each in manufacturing, and transportation and one each in wholesale/retail, public utility, and government. For the total number of employees in the firms surveyed, one had less than 500, three had between 500 and 1,000 employees, and three had over 5,000 employees. The number of IS employees ranged from 6 to over 100. The IS budget was between 1 and 5 million dollars for two companies, between 5 and 10 million dollars for two companies, and over $10 million for three companies.

Respondents. Table 2 summarizes the results of the biographical information. As can be seen in Table 2, 29.1% of the respondents in the survey were females and 70.9% were males. The average age of the respondents was about 36 with approximately 11 years of experience in the field. Thirty-nine of the respondents indicated that their position was either project leader, IS manager, or IS supervisor. The remaining 71 classified themselves as programmers, analysts, database managers, technicians, or system engineers. A majority of the respondents had a least a college degree (80%).

Table 2
Profile of Respondents

Sample Size	110
Gender	
Female	32 (29.1%)
Male	78 (70.9%)
Age	
Mean	36.49
Standard Deviation	8.39
Years of Experience	
Mean	11.05
Median	11.00
Standard Deviation	7.31
Position	
Project Leader	39 (35.4%)
Programmer/Analyst	71 (64.6%)
Education	
Did not complete a College Degree	22 (20.0%)
Bachelors Degree	64 (58.2%)
Graduate Degree	24 (21.8.0%)

RESULTS

Hypotheses 1 and 2. The means for each condition for all IS developers are presented in Table 3. To test Hypotheses 1 and 2, a 2 (Short vs. Long-term objectives) X 4 (Levels) repeated measures ANOVA was performed on the data. The analysis yielded a significant effect for short-term vs. long-term objectives ($F = 146.9$, $p = .001$). As can be seen in Table 3, in every case, the short-term objectives were viewed as significantly more important than the long-term objectives. The analysis also produced a statistically significant effect between levels ($F = 11.08$, $p = .001$). As illustrated in Table 3, the objectives at the systems and organizational level were rated as more important than the user and strategic level objectives. The interaction between the short/long-term objectives and the level of the objectives was also statistically significant ($F = 19.15$, $p = .001$). Simple main effects analysis indicated that there were no differences between the four objective levels for the short-term goals. For the long-term goals, the simple main effects analysis indicated that the system level goal was perceived as more important than the goals at the other three levels ($p < .05$). The simple main effects analyses comparing the short versus long-term goals indicated that there was a statistically significant difference for the user, organizational and strategic level goals ($p < .05$).

Table 3

Mean Importance Ratings of Objectives for All IS Developers

Level	Short-term	Long-term	Grand Means
System	6.30	6.10	6.20
User	6.37	5.27	5.82
Organizational	6.31	5.94	6.12
Strategic	6.27	5.31	5.77
Grand Means	6.30	5.67	

Hypotheses 3. The third hypothesis proposed a relationship between experience and perceptions of IS objectives. The median years of experience was used to divide the respondents into two groups of about equal size (those with less than 11 years vs. those with 11 or more years of experience). The means for each objective by level of experience are displayed in Table 4. To test Hypothesis 3, a 2 (Experience) X 2 (Short vs. Long- term objectives) X 4 (Levels) split-plot ANOVA was performed on the data. The results did not produce any statistically significant effects related to experience.

Table 4

Mean Importance Ratings of Objectives by Experience and Position Level

	Experience		Position Level	
	Under 11 yrs	11 yrs or over	Programmers	Leaders
Short-term				
System	6.25	6.35	6.26	6.31
User	6.30	6.44	6.39	6.33
Organizational	6.38	6.24	6.27	6.38
Strategic	6.21	6.26	6.17	6.36
Grand Means	6.28	6.32	6.28	6.35
Long-term				
System	6.02	6.19	6.03	6.23
User	5.35	5.20	5.09	5.62
Organizational	5.91	5.96	5.86	6.08
Strategic	5.28	5.37	5.11	5.67
Grand Means	5.64	5.69	5.54	5.90

Hypotheses 4. The fourth hypothesis proposed a relationship between occupational position and perceptions of IS objectives. The IS developers were divided into two groups according to their position as shown in Table 2. To test Hypothesis 4, a 2 (Position) X 2 (Short vs. Long- term) X 4 (Levels) split-plot ANOVA was performed on the data. The results are displayed in Table 4. The interaction between position and objective level was not statistically significant ($F = 0.74$, $p = .53$). However, the interaction between position and short and long-term benefits was statistically significant ($F = 7.26$, $p = .008$). The significant interaction is illustrated by the difference in the grand means in Table 4. Simple main effects analysis indicated there was no difference between the two ranks for the short-term goals. That is, both groups viewed the short-terms goals as highly important. On the other hand, the simple main effects analysis indicated that the project leaders rated the long-term benefits as more important than did the programmers/analysts ($p < .05$).

Hypothesis 5. The last hypothesis proposed a relationship between education level and perceptions of IS objectives. The IS developers were divided into three groups according to education level as displayed in Table 2. To test Hypothesis 5, a 3 (Education Level) X 2 (Short vs. Long- term) X 4 (Levels) split-plot ANOVA was performed on the data. The results are displayed in Table 5. The interaction between education and short and long-term goals was not statistically significant ($F = 1.95$, $p = .146$). However, there was a statistically significant interaction between education and objective level ($F = 2.55$, $p = .020$). The interaction effect is illustrated by the difference in the grand means in Table 5. A simple main effects analysis indicated there were no significant differences between the three education levels for system and strategic level goals. However, the simple main effects trend analysis indicated that the perceived importance of user and organizational level goals increased with the amount of education. ($p < .05$).

Table 5

Mean Importance Ratings of Objectives by Education

	Less than College	College Degree	Graduate Degree
System Level			
Short-term	6.09	6.31	6.46
Long-term	6.27	6.06	6.04
Grand Means	6.18	6.19	6.25
User Level			
Short-term	6.50	6.22	6.67
Long-term	4.75	5.271	5.83
Grand Means	5.28	5.74	6.13
Organizational Level			
Short-term	5.98	6.34	6.58
Long-term	5.27	6.17	6.38
Grand Means	5.59	6.22	6.35
Strategic Level			
Short-term	6.27	6.17	6.38
Long-term	5.22	5.34	5.29
Grand Means	5.75	5.76	5.83

DISCUSSION

The current study examined the perceptions of IS developers regarding the objectives of IS to empirically determine if developers' views are too narrow in scope and tend to overly emphasize the short-term, technically oriented goals. The results of the study demonstrate that developers may possess more traditional views of IS objectives which may not be appropriate given the dramatic changes in the role of IS over the past decade. That is, the IS developers perceived the short-term objectives significantly more important than the long-term objectives. It was also observed that systems and organizational level goals were perceived as more important than the user or the strategic level objectives. Thus, the results generally provide empirical support for the claims made in previous studies. It would appear that the IS development and implementation process could be improved with more emphasis on non-system level objectives and better planning for the future needs of the organization. However, it should be noted that although there is a growing emphasis on long-term, non-system level goals, it may still be useful for project teams to have some members whose primary focus is on the technical aspects of IS development [14, 23].

The current investigation also examined possible individual differences among IS developers. More specifically, the study looked at potential differences due to level of experience, occupational position, and level of formal education. It might be reasonable to assume that with more experience and time to interact with management and user groups that IS developers' views would adapt and become more consistent with the organizational goals. There was no support for this proposition in the current study. That is, experience had no influence on the perceptions of IS developers with regards to IS objectives.

In terms of possessing a better understanding of the long range plans, the higher the position (IS managers, project leaders, and supervisors) the greater the tendency to perceive the importance of long-term IS objectives. This could possibly be due to more interactions with management and user groups within the organization. The results of the present study also support the notion that further education increases the IS developers awareness of the importance of both organizational and user objectives. However, the level of education did not influence the perceived importance of the strategic goals and the importance of long-term goals.

Implications

The results provide empirical support for the view that IS developers focus on short-term, technical issues. However, it has been noted that IS can fail in three ways: during the development process, at the stage of introduction to the users (implementation), or at some point during their operation [40]. This would suggest that IS developers may need to take into considerations the long-term objectives of the project and how non-system level objectives may affect the success of the project.

In a recent study employing the Delphi Technique, IS managers indicated that they believe it is essential for them to participate in the design, development, implementation, training and use of a system in order to ensure IS success [31]. Yet the results of the Delphi survey indicated that while most IS managers were involved in the development process, only half of the IS managers were involved in the implementation stage and most had no involvement in the training and use stages. The results seem to suggest that management needs to understand that the role of IS developers does not end when the system is installed. If IS personnel do not have a role in the project beyond the development stage, it is understandable that they would primarily focus on the short-term, system level objectives. It would appear to be beneficial if organizations followed the typical recommendations that all interested parties (developers, users, managers, etc.) be actively involved and informed throughout the requirements assessments, analysis, design, development, and implementation process.

A number of studies have suggested that IS personnel need to develop a broader understanding of the role of IS in the organization and the fit between IS and organizational goals. More experience in the IS field does not appear to provide a solution to this problem. That is, experience in the IS field did not have an impact on the perceived importance of long-term, non-system level IS objectives. Apparently, experience does not necessarily lead to a better understanding of the organizational issues and future directions of the organization. Perhaps, more experience simply does not guarantee much interaction and communication across areas within the organization.

Any time a problem develops, an easy solution is to suggest that further education is needed. In this case, the results of the present study would seem to support this notion. The results indicated that additional education was associated with greater perceived importance of some of the non-system level objectives. Thus, these results support the conclusions made by other researchers that to be more effective in a highly competitive market, organizations need to view employees as assets whose value can be enhanced through education and training [37]. Needs assessments should be conducted and evaluated in terms of knowledge and skill requirements to determine how education might be most beneficial for IS developers [37].

The type of education typically suggested to overcome many of the problems associated with IS failure does not generally involve more IS training and technically oriented courses. Rather, most researchers seem to be advocating courses that increase the understanding of other functional areas within the organization, how businesses operate, and behavioral issues [6, 30, 31, 37]. Thus, it would appear that researchers are recommending more traditional MBA courses over additional technical training. It may be that experience in the IS field provides IS developers with the opportunity to achieve sufficient technical expertise, but not necessarily the knowledge required outside the IS field to ensure successful IS implementation.

The results suggest more job responsibility (i.e., higher rank) tends to increase the perceived importance of long-term goals. This could be the result of additional responsibility for projects, requiring those with higher ranks to interact more with user and management groups. If so, the results would generally be consistent with the user-participation strategy that is often recommended to provide developers with a better understanding of how the system will benefit the organization. Thus, one possible solution to improving the IS developers' views on long term goals of IS may be to adopt a job rotation or job enrichment program that allows programmers and analysts the opportunity to assume more responsibility for projects. This could possibly provide IS developers with more opportunity to interact with groups outside the IS area.

The results are consistent with Liebowitz's [31] recommendation that in order to improve the likelihood of successful IS projects it is necessary to identify and cite causes/reasons for project failure and distribute these lessons learned to management, project leaders, and project developers. The important point is that the results should be always communicated to everyone involved in the process and there should be an opportunity for everyone to become familiar with long range goals of an IS. In the final analysis, the developers must take the responsibility for the review and use of systems and not simply be concerned with the technical aspects of the system.

Limitation of the Study

A few limitations regarding the study should be noted. First, the study was based on several large mid-western organizations that frequently recruit at the university where the study was conducted. Thus, the sample was one of convenience rather than a random sample of organizations of various sizes throughout the U.S. In addition, participation in the study was basically on a volunteer basis. Thus it was not possible to determine the exact response rate or estimate the problems associated with non-response bias. However, there is no reason to assume the IS developers in this study differ much from IS developers in general. In addition, based on information obtained from the contact person, most of the developers asked to participate in the study provided completed questionnaires, suggesting that the non-response bias may not be a significant problem.

A second limitation of the study is that it was primarily an exploratory study, focusing on the perceptions of the IS developers. Thus, it was not possible with the procedure used in the present study to examine how much effort is actually expended on each of the objectives. However, perceptions are often found to be accurate reports of the actual behavior exhibited, suggesting there may be very little difference between effort expended and the reported importance of the objectives [21].

Another possible limitation of the current study is that it did not attempt to assess all possible objectives. Rather the purpose of this study was only to examine the perceived importance of different types of objectives. This study also did not attempt to investigate how management and users perceive the importance of the objectives. Thus, it was not possible to directly compare the IS developers' perceptions with the perceptions of users and management groups. Rather, only indirect comparison can be made with management and users through the results of the numerous prior studies that have focused on their views.

Conclusions

As a whole, the IS developers perceived the short-term objectives and the system level objectives (along with organizational objectives) as the most important. The amount of experience in the IS field had no influence on the IS developers' views regarding the objectives of an IS. It was observed that IS developers with a higher rank tended to view the long-term goals as more important that the programmers/analysts. Finally, the perceived importance of user and organizational goals increased with the level of formal education.

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APPENDIX A

Questions for individuals: (Check one)

1. You are? _____ (1) Female _____(2) Male

2. What is your highest completed education level?
   _____ (1) High School _____(2) Some college or technical training
   _____ (3) Bachelor's Degree _____(4) Graduate degree

3. You college major was (if applicable):
   _____ (1) Computer science _____(2) MIS or CIS
   _____ (3) Business _____(4) Other (Specify) _____

4. Years worked at your current job: _____ years

5. Years worked for your current employer: _____years

6. Years worked in the IS/IT industry: _____years

7. Your current position (check one)
   _____ (1) VP/Director _____ (2) IS manager
   _____ (2) Supervisor/project manager _____ (3) Programmer
   _____ (4) Analyst _____ (6) Programmer/Analyst
   _____ (7) Other (specify) _____

8. What is your age? _____ years

9. **In your opinion, how important is the achievement of the following objectives for overall information system success?** Circle a number from 1 to 7 indicating the importance of the item with "1" – not important to "7" very important.

	Not Important						**Very Important**
(1) Generating operational benefits	1	2	3	4	5	6	7
(2) Reliable (bug-free) system	1	2	3	4	5	6	7
(3) Improving the effectiveness of business operations	1	2	3	4	5	6	7
(4) Enabling cooperative partnerships	1	2	3	4	5	6	7
(5) Improving productivity of managers	1	2	3	4	5	6	7
(6) Satisfying user needs	1	2	3	4	5	6	7
(7) Improving customer service	1	2	3	4	5	6	7
(8) Easily maintainable systems	1	2	3	4	5	6	7