

# The Use of Infrastructure Variables in Explaining CIS Program Satisfaction/Return

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## ABSTRACT

The study develops the relationship between CIS program infrastructure variables and satisfaction/return among a sample of CIS alumni. The study is unique in its macro variable orientation and includes such infrastructure variables as faculty, technological support, placement services, overall curriculum, etc. The study addresses the tenets of services marketing with respect to the attributes and features that influence consumer satisfaction. The results of the analysis explain sizable variance (61.6%) and key predictors are identified, mainly "overall curriculum." The study adds to the arsenal of outcome assessment approaches and provides a platform for improvement that may influence program satisfaction/return.

**Keywords:** Infrastructure, satisfaction, regression, explanatory power, assessment

## **INTRODUCTION**

CIS programs in the quest for continuous improvement and quality enhancement have frequently turned to the viewpoints of practitioners as a primary information input (Ehie, 2002; Gonzenbach, 1998; Leitheiser, 1992; Regan & O'Connor, 1994). Other disciplines have also followed this approach (Ackerman, Gross & Perner 2003, Ellen & Pilling, 2002; Feldman & McNally, 2002). Still much can be learned from student input, especially that directed toward the determinants of student satisfaction (Chrysler & Van Auken, 2002). Typically, the focus of such studies has been on curriculum relevancy as seen through the eyes of former students. In other words, what CIS courses drive student satisfaction? However, CIS programs also possess product and service features and it is well established that overall satisfaction can be influenced by specific features (Zeithaml & Bitner, 2003). Thus, an assessment of the relative value of such program features as facilities, placement services, faculty, technological support, an opportunity for networking, and overall curriculum appears promising. To our knowledge, a study of program infrastructure has never been done, especially one that relates program features to an assessment of overall satisfaction/return. Basically, such an assessment may reveal drivers of satisfaction that offer some surprise. Also, weaknesses can be revealed that are capable of improvement. This study therefore will assess the relative value of a CIS program's infrastructure with respect to its relationship to CIS program satisfaction/return among CIS alumni. The study design is universal, although it is expected that the results will be idiosyncratic to a particular institution. The study thus adds to the arsenal of assessment approaches and may be included as part of any outcome assessment.

## **RESEARCH APPROACH**

### **Variables**

The study will measure six CIS program infrastructure variables as to their effectiveness using a seven-point scale. The anchors range from Poor coded as a one to Excellent coded as a seven. These variables also appear in Table 1. Next the study will measure CIS program satisfaction/return using measures that range from expectations to return on investment (see Table 2). These measures are scored using seven-point Likert scales with the high end denoting Very Strongly Agree. For another study that has measured satisfaction in terms of ROI see Van Auken, Chrysler, and Wells (2005).

### **Sample**

The sample is comprised of 45 CIS alumni. The institution in question is AACSB-I accredited and is located on the West Coast. Initially, 215 alumni were contacted and 45 responded for a 21% return rate. It is intended to continually add to this data base to further explore the implications of the variable assessments.

## ANALYSIS

### Preliminary Results

A revelation of the means and standard deviations of program defining infrastructure variables is presented in Table 1.

Table 1  
Means and Standard Deviations of CIS  
Program Infrastructure Variables

Variables <sup>1</sup>	Means	Standard Deviations
Facilities	5.073	1.058
Placement Services	3.293	1.662
Faculty	5.098	1.200
Technological Support	4.488	1.121
Opportunity for Networking	3.781	1.525
Overall Curriculum	4.732	1.001

<sup>1</sup> The infrastructure variables were coded using a seven-point scoring scheme with 1 denoting Poor and 7 portraying Excellent.

As can be noted from the seven-point scoring system, the higher mean scores are associated with IS/CIS program faculty (5.098) and facilities (5.073) followed by overall curriculum (4.732) and technological support (4.488). Two variables scored lower than the 4.0 scale midpoint and they encompassed an opportunity for networking (3.781) and placement services (3.293). Clearly, preliminary strengths and weaknesses have been revealed. Still, the relative value of these variables is explaining IS/CIS program satisfaction/return needs to be developed.

### Program Satisfaction/Return

Table 2 presents the results of applying a principal components factor analysis with varimax rotation to the study's program satisfaction/return variables.

Table 2

Results of Principal-Components Factor Analysis  
of CIS Program Satisfaction/Return Variables

Variables <sup>1</sup>	Factor Loadings
My IS/CIS Program Fulfilled My Expectations	.815
When I Compare My Total Program Expenses to the Quality of My IS/CIS Education, I Rate the Return on My Investment as High	.896
I am Very Inclined to Recommend this IS/CIS Program to a Close Friend	.803
My IS/CIS Education Represents Money Well Spent	.892

<sup>1</sup> The satisfaction/return variables were coded using a seven-point scoring scheme with 1 denoting Very Strongly Disagree and 7 indicating Very Strongly Agree

As can be noted, a single factor has emerged that explains 72.66% of the variance in the data set. The factor loadings are substantial and denote the correlation between each variable and the underlying factor. In this case, the “glue” that appears to hold the variables together is indeed satisfaction/return.

Rather than work with factor scores, the four variables were summed and averaged and produced a mean score of 4.8110 ( $\sigma = 1.136$ ). Overall, the mean satisfaction/return score appears to be quite satisfactory.

#### Multiple Regression

To determine the extent of covariation between the six IS/CIS program infrastructure variables and the study’s dependent variable comprised of satisfaction/return, a multiple regression analysis was employed. This analysis produced a  $R^2$  value of 61.6% and a highly significant F value ( $F = 9.089$   $\partial$  6 and 34 d.f.;  $p = .000$ ). Overall a substantial amount of variance has been explained. A presentation of the regression details appear in Table 3.

Table 3

Results of Regressing CIS Program Infrastructure  
Variables Against Program Satisfaction/Return

Variables	Beta Coefficients	Beta Weights	t	Sig.
Facilities	-.079	.074	-.579	.567
Placement Services	.005	.007	.058	.954
Faculty	.227	.240	1.529	.136
Technological Support	-.280	.276	-2.009	.053
Opportunity for Networking	.039	.053	.339	.693
Overall Curriculum	.813	.717	4.326	.000

As can be seen in the analysis of beta coefficient signs, the predictor variables generally co-vary directly with the criterion variable with the exception of technological support and facilities which co-vary inversely. A further assessment of beta weights reveals the relative power of the predictors in explaining program satisfaction/return. As can be noted further in Table 3, the overall curriculum variable is dominant followed by technological support and faculty. An accompanying t analysis reveals a statistically significant association between the overall curriculum variable and the study's dependent variable ( $P=.000$ ), while technological support yields a near statistical miss ( $P = .053$ ). On balance, the IS/CIS infrastructure variables do not explain satisfaction/return with the exception of the program's overall curriculum. Also, a weakness in technological support has been revealed. Clearly, the reviewed program's strength is in curriculum.

Since the regression analysis results may be impacted by multicollinearity, an analysis of collinearity diagnostics revealed that no Variance Inflation Factor exceeded 10.0 and no two variables accounted for .90 or above of variance proportions. What collinearity was revealed was viewed as inconsequential.

## IMPLICATIONS

The results of the assessment reveal that only the infrastructure variable known as overall curriculum was explaining CIS program satisfaction/return. In essence, overall curriculum is the primary driver of satisfaction. This reinforces the importance of curriculum updating and management. Additionally, technological support co-varies inversely with satisfaction/return, thus suggesting that improvements in technological support would help to bolster CIS program satisfaction/return. What is most surprising is the lack of predictive power of the program's faculty and other infrastructure variables. Uniquely, only two variables drive satisfaction and one of them (technological support)

is shaky in a statistical sense. On balance, for this particular program, overall curriculum is a primary driver of program satisfaction/return.

## **SUMMARY AND CONCLUSIONS**

This study has attempted to add to the assessment literature by determining the relative value of CIS program infrastructure variables with regard to their relationship to a satisfaction/return variable. The approach utilized a multiple regression analysis procedure and it revealed that two of six infrastructure variables influence satisfaction/return (overall curriculum,  $P = .000$  and technological support,  $P = .053$ ). The results provide focus and denote emphasis points for program improvement. Since the results evidence a smaller sample size, they are viewed as preliminary and additional alumni data will be collected. With a larger sample, more statistical power can be generated. Regardless, the procedure denotes another angle of analysis and it is worthy of further study in outcome assessments. The approach also has utility in monitoring improvement efforts to determine if enhancements indeed influence satisfaction/return. All too often weaknesses are identified and nothing is really done to assess whether improvement efforts really work. This approach has promise as a diagnostic and as a way to measure improvement results. It is also, to our knowledge, the first effort to assess perceived program infrastructure effectiveness and its relationship to program satisfaction. Hopefully, it will encourage additional research and study.

## **REFERENCES**

- Ackerman, D. S., Gross, B.L., & Perner L.E. (2003). "Instructor, student, and employer perceptions on preparing marketing students for changing business landscapes," *Journal of Marketing Education* 25 (April): 46-56.
- Barr, T.F. & McNeilly K.M. (2002). "The value of students' classroom experiences from the eyes of the recruiter: information, implications and recommendations for marketing educators" *Journal of Marketing Educators*, 24 (August): 168-173.
- Chrysler, E. & Van Auken S. (2002). "Entry level value versus career value of MIS courses: faculty expectations versus alumni perceptions," *Journal of Computer Information Systems*, 42 (3): 38-43.
- Ehie, I. C. (2002). "Developing a management information systems (MIS) curriculum: perspectives from MIS practitioners," *Journal of Education for Business*, 77 (January/February): 151-158.
- Ellen, P. S. & Pilling B. K. (2002). "Using employer input to assess graduate marketing education effectiveness: a working example of curriculum development," *Marketing Education Review*, 12 (Spring): 31-42.
- Gonzenbach, N.M. (1998). "Developing an information system curriculum with input from business and industry," *Office Systems Research Journal*, 16 (1): 9-14.
- Leitheiser, R.L. (1992). "MIS skills for the 1990s: a survey of MIS managers' perceptions," *Journal of Management Information System*, 9 (1): 69-91.

- Regan, E. & O'Connor B. (1994). *End-user information systems: perspectives for managers and information systems professionals*. New York: Prentice Hall/MacMillan.
- Van Auken, S., Chrysler, E. & Wells, L.G. (2005). "The relating value of skills, knowledge, and teaching methods in explaining MBA program return on investment" *Journal of Education for Business*, 81(1): 41-45.
- Zeithaml, V. A. & Bitner M.J. (2003). *Services Marketing*, Boston: McGraw-Hill/Irwin.

