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USING INFORMATION SYSTEMS THEORY
TO INCREASE IS ENROLLMENT

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Abstract

Information systems (IS) departments have been struggling with declining enrollment since 2001. While we have shared ideas about how to increase enrollment at our conferences, few of us have looked to our theory to design initiatives to increase enrollment. This paper describes an action research project where the authors draw from IS research to design an event to increase enrollment in the IS major. First, we pulled on common IS knowledge showing that system success requires user involvement. Using this lesson, we identified our stakeholders, got their input, and involved them in the event. Second, we drew on social exchange theory and conceptualized the event as a boundary object bringing different stakeholders together to donate and acquire resources. Third, we drew upon the information processing cycle and social capital theory, to show what types of resources are critical to designing an event that converts pre-business majors to IS majors. The paper offers practical insights to design your next IS recruiting event and shows how we can use IS theory to design initiatives that address our enrollment problems.

Keywords: enrollment, education, action research, social exchange theory, social capital theory

Introduction

The late 1990s through late 2001 were good times for information systems (IS) departments. The move toward enterprise resource planning packages, the year 2000 problem, and the use of the Internet in business created a high demand for IS majors. In 2001, IS enrollment began declining. The year 2000 problem was solved, the media publicized Internet failures, American companies began outsourcing their IS development to other countries, and finally 9/11 shook the foundations of our financial markets. As a result, many IS professionals lost their jobs and few recruiters visited our campuses. This caused incoming students to think that there may not be jobs for students majoring in IS. While other business school faculty questioned whether IS programs should be continued, IS faculty wondered whether IS was a worthwhile major. These negative perceptions of our field seem to persist in spite of there being a very promising job forecast for our students (United States Department of Labor, 2006-2007).

Given this seemingly chronic situation of declining enrollment in IS programs, attracting new majors has become a burning issue for faculty in IS departments. This is one of the top issues for the Association of Information Systems and a topic of hot debate at recent and upcoming AMCIS and ICIS conferences. These discussions have brought university IS departments together to share practical insights about how to increase enrollments. To date, we are unaware of any studies that have utilized IS theory as a guide in solving the enrollment problem. As such, the purpose of the paper is to explain how our IS department incorporated lessons from IS research to design an IS recruiting event to address our enrollment challenges. The next section will explain the theoretical perspectives underpinning this research. This is followed by the method, a description of the event, the discussion, and the conclusion.

Literature Review

Since action research, calls for the researcher to use theories to solve real world problems, we drew from IS research to design a recruiting event to address our enrollment problems. IS implementation research explains how to implement systems such that they are used and adopted by organizations (Dennis, et al. 2002). We applied two such theories to our system which was the IS recruiting event. The first theory of user involvement suggests that users are more likely to employ a particular system when designers seek out and consider their input. First, users understand the problem domain better than the designers and are able to provide input to design a system that better meets their needs. Second, since users are involved in designing a system, they will more likely take ownership in the system's success. Applying this theory to the domain of our recruiting event, the researchers (designers) actively solicited key stakeholder (e.g. students) input into how this event should be designed. This was done to gain a deeper understanding of each parties particular needs and to increase the likelihood of their participation in the event.

A second perspective applied to the design of our recruiting event was social exchange theory (Emerson, 1962). Social exchange theory explains that stakeholders in a given relationship will be willing to exchange key resources they have for resources they need. Applied to the context of our recruiting event, this theory was useful for explaining why the various stakeholders (e.g. businesses) would be willing to give up valuable resources (e.g. their time) to gain access to other resources (e.g. access to prospective employees).

Figure 1 shows that we designed the IS recruiting event to be a boundary object for the different stakeholders to exchange the resources that they possessed for the resources that they needed. Considering IS research on user input, designing the event required identifying and soliciting input from key stakeholders (students, faculty, and businesses recruiting IS majors). The discussion section of this paper will further develop this figure by identifying what resources each stakeholder donated to and acquired from the event.
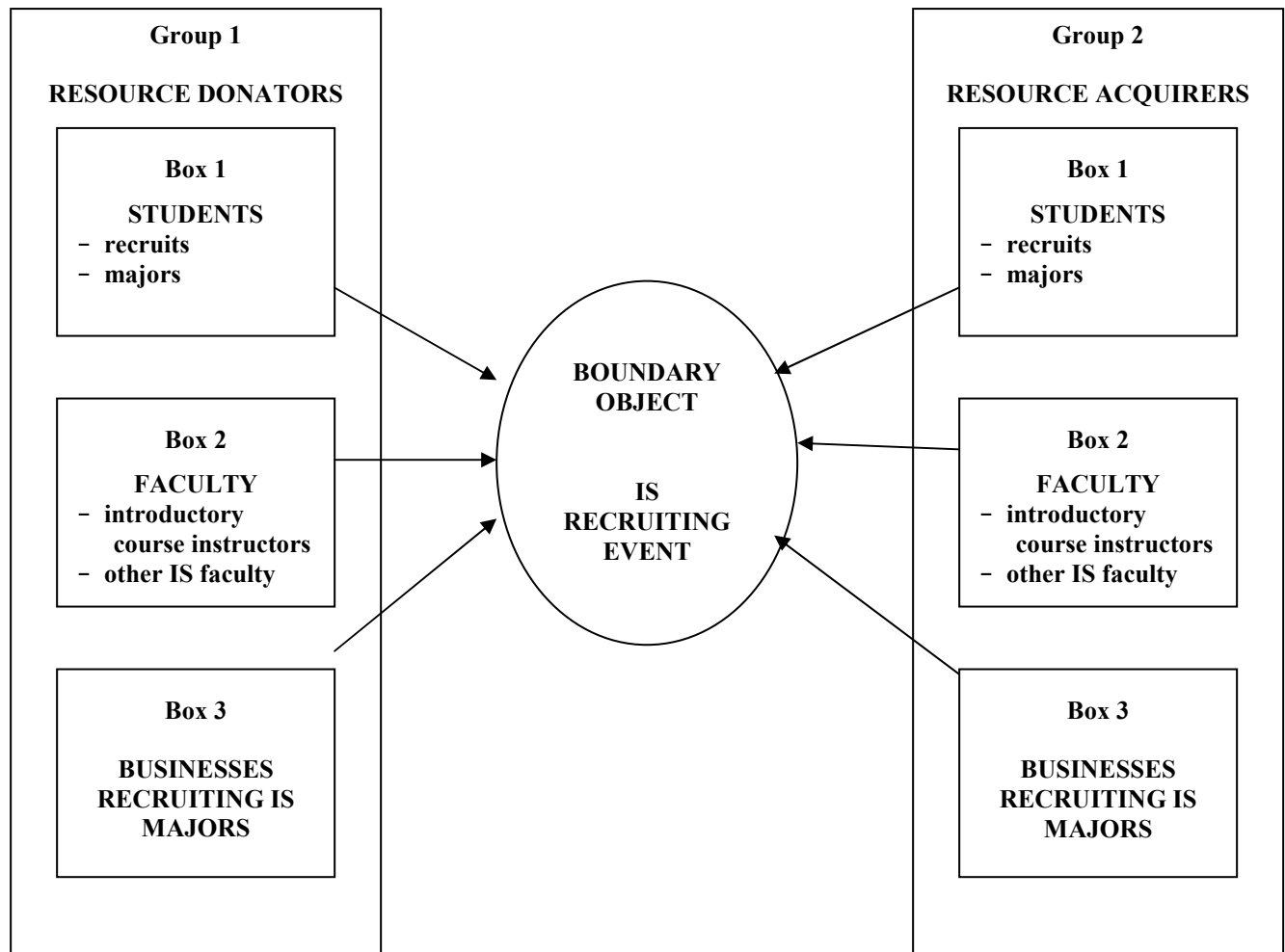
Figure 1. Model Framing the Research

Research Method

This study adopts an action research approach to design an IS recruiting event. In action research, the researcher is actively involved in solving a real world problem.   The action researchers collaborate with practitioners to introduce changes to a complex social process and observe the effects (Baskerville and Stage 1996). The researcher's theory about the effect of the change is validated by evaluating the extent that the intervention solves the problem (Baskerville and Stage 1996). This creates theoretical and practical knowledge.

In this study, the problem was how to design an event that would increase enrollment in the IS major.   The researchers were two faculty members trying to address the IS enrollment problem in collaboration with the other faculty members, businesses, and students. The theory was that we could design an event to increase IS enrollment by pulling on concepts in IS implementation research.

To conduct this research, we followed the action research cycle (Baskerville 2001; Susman and Evered 1978). This cycle consists of diagnosing, action planning, action taking, evaluating, and specifying learning. Figure 2 shows what we did in each step. As the initial cycle completes, the learning forms the basis for a new problem solving cycle. This research reports on one action research cycle.
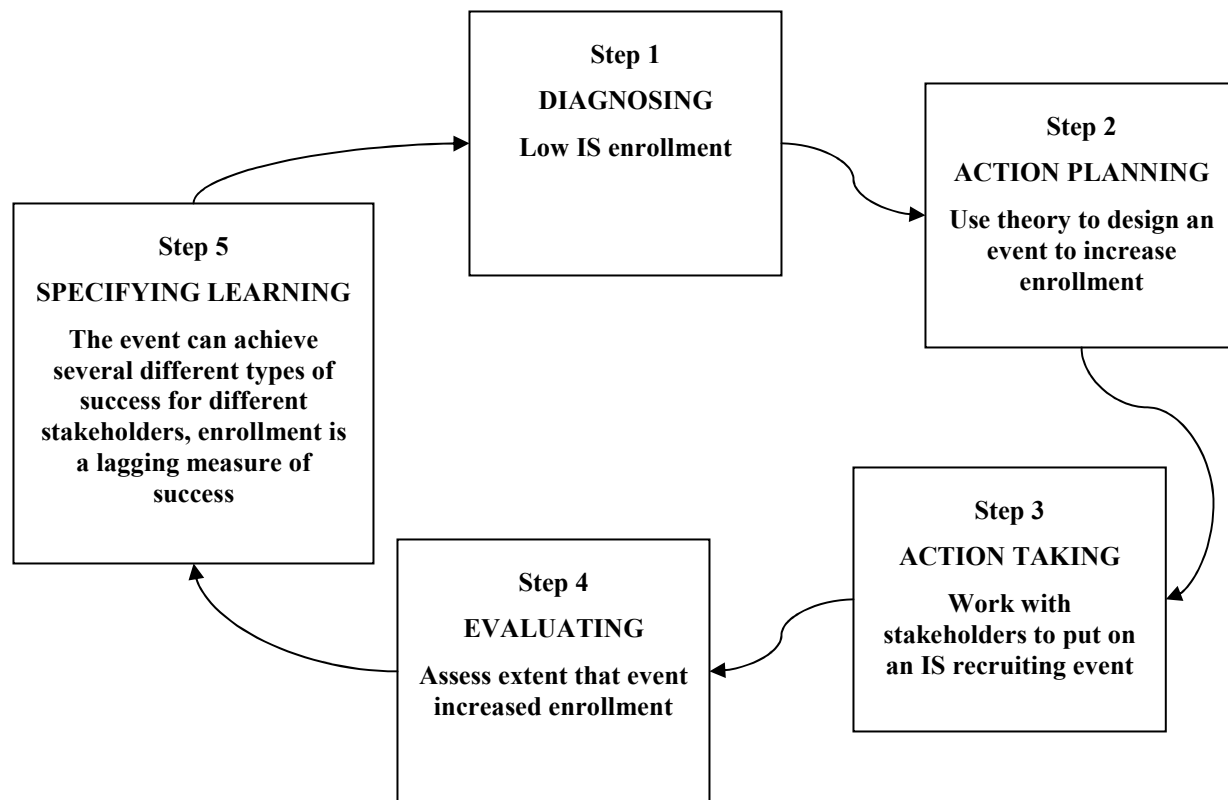
Figure 2. Action Research Cycle

The Event

We originally envisioned the event as an event to recruit students to the IS major. We envisioned bringing businesses in to tell pre-business students about IS careers and the IS job market. As we gathered information from our students, businesses, and faculty, the event evolved to one that facilitated resource exchanges between and among our stakeholders. Relationships became stronger as these groups each took ownership of the event and worked on planning the venue, the activities, and the interaction.

Venue

Our venue facilitated relationships. Instead of a classroom with rows of desks and a stage, we located the event in a scenic banquet room and set up round tables. A senior person (e.g. faculty, IS major, business person) sat at each table with potential recruits to the IS major. The arrangement facilitated informal conversation before, during, and after the program.

Activities

The event included activities that facilitated relationships and developed skills. These activities included marketing, three contests, a game tournament, and the program. The stakeholders worked together to market the event and named the event the IS Summit. Because we had funding from the businesses, we worked with a professional marketer to design a hanging banner, posters, fliers, tickets, and digital marketing.

To help our majors feel a part of the event, they designed the t-shirts that they would wear at the event, the website, and the game tournament. This enabled them to showcase their skills to the businesses and to our recruits. Some of our majors suggested going into the introductory to computers class to market the event. Planning and giving the talks

strengthened the relationships between the majors and the faculty. The class talks built initial relationships with the recruits which where strengthened during the event.

Three contests facilitated relationships and helped to develop interpersonal and communications skills. The networking contest evolved from a brainstorming session between the businesses, two faculty, and the majors. The contest awarded cash prizes to the IS major that invited the most people to the event. This contest provided an incentive for the majors to talk to students about a degree in IS, invite them to the event, and then visit with them while they were at the event. These activities helped our majors develop social skills like networking and selling, which are often poorly developed in IS majors. The second contest facilitated relationships by motivating students to stay around and visit after the program. For this contest, our majors drew for door prizes that the businesses donated. These prizes (i.e., I-Pods and gift cards) were valuable to our students and promoted the businesses sponsoring the event. The third contest awarded prizes to the students that won a Counter-Strike tournament, which our majors hosted after the event. The Counter-Strike tournament facilitated relationships as it helped our faculty and majors get to know recruits who were interested in the video game.

The majors envisioned, planned, and led the Counter-Strike tournament. These activities created strong relationships among the majors and the faculty as they worked through the tournament details. The tournament gave our majors the chance to develop leadership, negotiation, networking, and computer skills. Because our faculty knew nothing about the game, the students had to negotiate software licenses, write the tournament rules, install the game server, and run the tournament.

Finally, we worked with the businesses to plan the program. We invited three businesses that were heavily recruiting our majors and did not compete in the same sectors. We invited a consulting firm, an oil and gas company, and a financial services company. We talked with the recruits, majors, and faculty to learn about the topics that interested them. We shared this with the businesses and provided them feedback on their presentations before they came. This feedback resulted in a program where we discussed and had recent graduates talk about the types of jobs that IS majors do.

Planned Interaction

To build relationships, we planned interactions. We had our majors and faculty welcome the businesses and the recruits to the event. This involved having the faculty and majors arrive to the event early and encouraging them to mingle with, look after, and entertain the businesses and the recruits. Our majors wore IS t-shirts so that the businesses and recruits could recognize them. Our majors and faculty sat at different tables to meet and talk with the recruits. And, our majors and faculty served pizza at the event. We continued the interaction after the event by having our majors and faculty visit with recruits they had met at the event and by having our majors and faculty write letters to the businesses thanking them for their participation.

Anticipating that the event would lead many students to major in IS, we developed a relationship with the advising office. In our school, students meet with advisers to choose majors and plan schedules. The advising office is in the basement and the advisers rarely get faculty attention or recognition.

Success Measures

The previous paragraphs have provided details on the event we planned to increase enrollment in the IS major. When we started this project, we believed that we would measure success in two ways. First, could we get the businesses and students to the event? And second, did the event increase IS enrollment? As we planned the event, we realized that the event could lead to more long-lasting, broader measures of success. This success would come from stakeholders working together to solve a problem that would benefit everyone. In this case, we evaluated success in several ways.

- Did the event increase interest in and information about careers in the IS field?
- Did the event help students with IS skills and businesses with IS jobs meet one another?
- Did the event give students and faculty an opportunity to improve their technology, leadership, and professional competence skills?
- Did the event allow interconnected stakeholders to get to know one another, exchange resources, and develop long-term relationships?

Discussion

The previous paragraphs have explained how we designed a recruiting event to achieve success for all the involved stakeholders. This discussion will now analyze why the event was successful using social exchange theory, social capital, and the information processing cycle.

Social Exchange Theory and Social Capital Theory

Social exchange theory explains that parties in a relationship are interested in exchanging resources that they have for resources that they need (Emerson 1962). Accordingly, when a given stakeholder perceives a needed resource to be valuable, then that stakeholder will be more willing to exchange or give up their own resources to acquire the needed resource. Using this theory, we got each stakeholder involved in the event by selling how the event would help them acquire resources they needed. Table 1 details the resources that each stakeholder acquired from the event, the resources they donated to the event in order to acquire the resources needed, and the input (ideas) each stakeholder gave to design the event. Our stakeholders included students, faculty, and businesses.

To understand, the nature of these resources further, Table 1 draws from social capital theory to classify these resources. Social capital theory distinguishes between human, physical, and social capital resources (Coleman 1988; Nahapiet and Ghoshal 1998). Human capital is "created by changes in persons that bring about skills and capabilities that enable them to act in new ways" (Coleman 1988, p. S100).   Physical capital is tangible and embodied in observable material form (e.g., money, buildings, and machines) (Coleman 1988, p. S100). Social capital exists in relations among people. It is difficult to see and may involve establishing purposeful relationships to generate benefits and offering short and long-term kindness with the assumption that this kindness will be returned. While human and physical capital tends to be more explicit, social capital is less visible, yet none the less important.

Table 1. Table of Stakeholder's Input, Donated Resources, and Acquired Resources Categorized by Resource Type

STAKEHOLDER	INPUT TO THE EVENT'S DESIGN	DONATED RESOURCES	ACQUIRED RESOURCES
STUDENTS			
Recruits	**Human capital: program content** **Social capital: having time to get to know the people at the event, asking questions one on one, having students sit in small groups so they could get to know one another, name tags**	**Human capital: potential to become an IS major** **Physical capital: attendance**	**Human capital: class credit, education about IS careers** **Physical capital: a day off from class, door prizes, and pizza** **Social capital: chance to find role models, mentors, and develop close connections with other students, faculty, and businesses**

STAKEHOLDER	INPUT TO THE EVENT'S DESIGN	DONATED RESOURCES	ACQUIRED RESOURCES
Majors	Physical capital: event name, game tournament including what game to play, the venue, the rules, and the registration process, t-shirt design, prize suggestions, marketing mechanisms and design suggestions, ticketing idea	Human capital: potential to fill an IS job, ability to tell recruits about the major and IS jobs, understanding of how to market and design an event appealing to underclassmen, ability to plan a game tournament that would bring attention to the event and build community among potential and existing IS majors Physical capital: attendance Social capital: relationships with businesses, ability to invite other students to the event, ability to make recruits feel welcome	Human capital: opportunity to develop planning, leadership, networking, and computer experience; and opportunity to learn about IS jobs Physical capital: door prizes, pizza, and money Social capital: relationships with faculty, businesses, and recruits; volunteer opportunity; prestige from winning contest
FACULTY			
Introductory Course Instructors	Physical capital: door prize, pizza, and ticket idea Social capital: Ideas about coming into the classroom and marketing the event, striking idea about having a required small group discussion after the program, and validating game night idea	Physical capital: attendance, ability to provide incentives to get the 432 students in the introduction to computers class to attend the event, ability to give class time to allow us to come in and market the event Social capital: ability to make potential majors feel welcome at the event, ability to make businesses feel welcome at the event	Human capital: ability to improve course content by giving students an opportunity to learn about IS careers from IS professionals Physical capital: job security from attracting majors Social capital: ability to build relationships with students, other faculty, and businesses

STAKEHOLDER	INPUT TO THE EVENT'S DESIGN	DONATED RESOURCES	ACQUIRED RESOURCES
Other IS Faculty	**Physical capital: event planning time** **Human capital: event planning ideas** **Social capital: stakeholder relationships to execute the event**	**Physical capital: attendance, putting company logos on marketing material, having students write thank you notes to companies, faculty writing thank you notes to companies** **Social capital: ability to make recruits and potential majors feel welcome at the event, faculty presence allows majors to build capital with faculty**	**Human capital: insight about what IS professionals do; ability to improve IS program by giving majors opportunity to interact with businesses, practice networking skills, leadership skills, and project management skills** **Physical capital: financial support for the event, job security from attracting majors** **Social capital: developing relationships with businesses for future advice and to place students in jobs, developing relationships with businesses for monetary support of department initiatives**
BUSINESSES	**Physical capital: Ideas about the contest such as door prizes and a sponsored contest; having a booth for the companies to put their materials and t-shirts**	**Human capital: knowledge about IS careers** **Physical capital: attendance, door prizes and contest prizes, money funding the event** **Social capital: developing relationships with faculty and students**	**Physical capital: students to fill their jobs** **Social capital: relationship with the IS faculty to continue to develop students to fill their jobs**

We will now discuss the main resources that each stakeholder donated to and acquired from the event.

Students

The recruits (e.g., the pre-business majors that we were trying to recruit to the IS major) and our majors offered and acquired several resources at the event. The recruits brought their potential to become an IS major and an employee of the businesses that were hosting the event, their attendance, and their attention to the event. Their attendance and attention made the companies feel that it was worth their effort to fund and participate in the event. To secure these resources, we positioned this event as a way for the recruits to meet class requirements. Their instructors gave them a day off from their class and/or course points for attending the event. We also mentioned what they would learn about IS, get pizza, meet people, and win prizes.

The IS majors brought their ability to fill the businesses' job openings, their ability to build relationships with the pre-business majors, and their insight into designing an event that the students would enjoy. To get their participation, we positioned the event as a way for the majors to secure resources that they needed. First, helping with the event allowed the majors to build social capital with the professors in the IS department and the businesses. These relationships could help with reference letters and employment. Second, helping with the event would enable them to develop skills and

experience for their resume.   Third, the event provided a forum for AITP to recruit members to their organization. Finally, the event allowed the majors to secure monetary resources and awards for helping with the event.

Faculty

To have a successful event, we needed our faculty to attend and encourage their students' attendance. Faculty teaching our introduction to computers class for pre-business majors donated their influence over the 432 pre-business majors to the event.   Three factors helped us get these faculty members interested in donating their students to the event. First, the department head, who controls course scheduling and pay raises approached these faculty members about their help with the event. Second, if enrollment did not increase they might lose their job. Third, the event would update them on current jobs in the IS area and help them teach their class. Our other faculty who teach IS majors brought their attendance and ability to develop relationships with the stakeholders to the event. We got their involvement by focusing on the need to increase enrollment in the IS programs and alleviate associated problems like courses not making and the IS major being discontinued.

Businesses

The event required business participation. When we recruited businesses, we positioned the event as a way for them to secure a critical resource-- IS majors to fill their IS jobs. We explained that we were disappointed that they had not been able to find enough good people to fill their positions and that we wanted to help them find and develop majors by putting on this event. In exchange for their invitation to participate, they donated several resources to improve the event. This included coming to speak at the event, funding the event, and sponsoring the contests. Because we were thankful for the resources that the companies had contributed and because we realized that the exchange relationship between our department and these companies should continue, we donated some additional resources to the companies. First, we developed their brand around the business school. We put their logos on all of the marketing material for the event (e.g., the website, t-shirts, banners, and posters), we mentioned their companies when we marketed the event, and we had two newspaper articles written about their involvement in the event. Second, we sent them letters from our students and faculty thanking them for their help with the event. They could include the letters and the marketing materials in their performance review to show that their recruiting efforts are making a difference.

The Information Processing Cycle

The information processing cycle (Figure 3), provides a useful framework for thinking about the role of these resources in designing events to recruit students to the IS major. The information processing cycle states that a system takes inputs, processes them, and creates outputs (Turban, et al. 2006). Our analysis indicates that physical and human capital are the inputs necessary to design an event that would achieve the desired outputs. Physical capital included money to fund the event, time to plan the event, and stakeholders to participate in the event. Human capital included having a program at the event and the student's potential to major in IS. The desired output was twofold: recruiting students to major in IS and these majors becoming employees of the organizations that sponsored the event. This output combined physical and human capital resources.
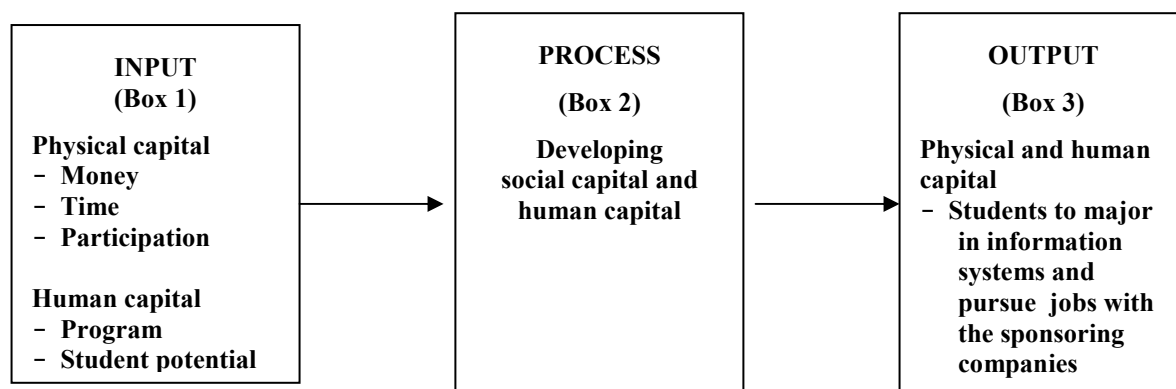

INPUT
(Box 1)
 	
Physical capital
– **Money**
– **Time**
– **Participation**
 	
Human capital
– **Program**
– **Student potential**
	PROCESS
	(Box 2)
	
	Developing
	social capital and
	human capital
		OUTPUT
		(Box 3)
		
		Physical and human
		capital
		– **Students to major**
		  in information
		  systems and
		  pursue jobs with
		  the sponsoring
		  companies

Figure 3. Combining Social Exchange Theory and the Information Processing Perspective to Design an IS Recruiting Event

The process part of this framework consists of the transformation of physical and human capital that occurred over time as we planned, marketed, executed, followed-up on, and reflected upon the event. Developing human capital and social capital (box 2) helped us transform the inputs (box 1) into outputs (box 3). We developed human capital by having the stakeholders listen to presentations and read marketing materials about the IS program, the IS job market, and IS career opportunities. We developed social capital by having the businesses, IS majors, and faculty develop relationships with one another and the prospective majors before, during, and after the event. The human and social capital that developed as the parties exchanges resources around the event (the process) gave prospective IS majors (an input) a newfound awareness of their potential to pursue a career in IS; thereby increasing the likelihood of them majoring in IS and pursuing jobs with the sponsoring companies (an output). Our analysis suggests that the social capital resources were much more important to the processing (e.g., converting pre-business majors to IS majors) than the human capital resources which were merely the backdrop for the event.

Many events are designed to improve human capital and the planners focus on physical capital. In this age, where human capital resources can be acquired conveniently from the Internet without leaving your home, events must be designed to enhance social capital.

Conclusion

This paper has discussed how an IS department used common IS knowledge, theory, and IS research to design an IS recruiting event. Pulling on social exchange theory, we conceptualized the event as a boundary object for each stakeholder to donate the resources each had in exchange for the resources they needed. Drawing from the research on user input, we identified the event's stakeholders and solicited their ideas to design the event. As we analyzed our data, we conceptualized the event using the information processing cycle. Each stakeholder would donate inputs, which would be processed into the desired outputs. The inputs and outputs were physical and human capital. Social capital resources were dominant in the processing of the inputs into outputs.

While this research makes several contributions, it has some limitations. The primary limitations are time and results. The paper reports on how we used theory to design the event, but only time will show the extent that the event has accomplished the various levels of success that we predict. As the next two years pass, we will be able to update the paper to show how the event has affected enrollment in and the quality of our IS program. So far, the event has become a boundary object improving the quality of our programs. The event has improved our relationships with our stakeholders. We have stronger relationships with the businesses, this is helping us place our students, receive input into our program, and secure financial resources to support our initiatives. The event has improved our IS majors' experience by giving them an opportunity to develop social networking, project planning, leadership, technology, and speaking skills. It has created a better connection between our majors and our faculty.

This study offers theoretical and practical insights. Theoretically, this study adds insight into the debate of whether IS can become a reference discipline (Baskerville and Myers 2002), by showing how others can use IS concepts to design social processes like recruiting events. Practically, this study provides insights into how to design an IS recruiting event so that the event can attract majors and become a forum for securing resources to strengthen IS programs. One of the primary lessons learned is the importance of involving your stakeholders when you plan your IS recruiting event. As you solicit each stakeholder's input, think about what resources they would like to acquire from the event and emphasize those resources as you get them involved. We put on this event because we needed majors; however, we never mentioned this to the businesses or students. When we talked to the businesses, we told them that we were disappointed that they were having trouble recruiting students to fill there IS jobs and we were designing the event to help them address the problem. When we talked to students, we told them that many students in other majors were having trouble finding jobs whereas IS majors were getting jobs and achieving the highest salaries in the business school. We told them we were putting on the event to make students aware of this situation.

Another lesson learned is that IS departments must help businesses find students to fill their positions. Over the years, career services has become a popular service on college campuses. Career services connects students that need jobs together with companies looking to hire students. If an IS department relinquishes their student's job search to career services, the IS department looses control of the student resource and is therefore less able to develop the relationships with businesses that they need to secure the resources that they need to improve their program and attract majors. Our paper suggests that the IS department work closely with companies <u>and</u> career services so that the companies see the department as a source for the critical resource that they need—students.

Given IS enrollment challenges, this is an area we must continue to research. Since many of us are taking actions to increase our enrollment, we could benefit by research showing what actions help. Researchers could classify the actions that departments are taking and use theory to explain what actions will help address enrollment and why. Another

research study, might compare and contrast why some departments were able to increase their enrollment while others are not.

We hope that this study will help IS departments use theory to design their initiatives that increase IS enrollment and strengthen programs.

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