

Built to Last? Applying a Program Sustainability Model to IS Degree Programs

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Abstract

The field of Information systems (IS) has undergone many changes since its inception including struggles with identity, legitimacy, and distinction from other computing fields. IS degree programs are typically found in colleges/schools of business, but sometimes they are not, and there is great variety in department names. Multiple issues have contributed to unstable or declining student enrollments and graduation rates despite stable employer demand and high starting salaries for degree recipients. Many IS programs have adopted program building strategies to address enrollment issues and employer needs but have done so in the absence of a comprehensive framework to guide their efforts. This paper investigates the potential of adapting/applying program sustainability frameworks to IS programs to increase their robustness in changing environments. It observes that prior enrollment management and curriculum modification initiatives are consistent with sustainability model premises and elements; so are factors viewed as important by IS degree program administrators.

Keywords

IS Programs, Program Sustainability, IS Program Enrollments

Introduction

The field of IS has been an attractive and major for students (Downey et al., 2011). In the 1990s, the emergence of the Internet and ecommerce increased the demand for technology professionals and led to increased enrollments across computing degree programs, including IS. Then, like now, many students viewed technology to be the future and were convinced that a computing degree would increase the chance for a high paying job in a high-demand field. In 2000s, however, the dot.com burst, aftermath of Y2K, and increased offshoring of computing jobs by US companies (Bednarzik 2005) diminished student perceptions of the long-term viability of employment in computing fields (Lenox et. al, 2008). Widespread declines in student enrollments in IS and other computing programs produced a sense of emergency among program administrators and presented one of the greatest challenges to IS as an academic discipline (Gill and Bhattacharjee, 2009). The declines also produced a spate of journal articles focused on combatting enrollment declines and improving student perceptions of the field.

During 2010s, numerous IS programs have sought to stabilize or increase their enrollments by embracing topics/emphasis areas (e.g. analytics and cybersecurity) predicted to be in high demand for the foreseeable future. Some IS programs have created new degrees, minors, or emphasis areas and changed their names to self-identify as a nexus for high-demand skillsets. Despite such changes, many IS degree programs continue to be threatened by low student interest (Burns et. al., 2014), and by identity and legitimacy issues that have challenged them since their inception (Looney et al., 2012; Firth et al., 2011).

This research seeks to determine whether program sustainability frameworks can be adapted/applied to IS degree programs to increase their robustness and resilience in the face of environmental changes including changing perceptions of IS as a discipline and enrollment variability. It is also motivated by variability in IS program responses to environmental changes. It observes that prior enrollment management and

curriculum modification initiatives map to sustainability model elements; so do factors considered to be important by IS degree program administrators.

Program Sustainability

Buck (2015) describes a program sustainability model grounded in systems theory that may be applicable to IS degree programs. For Buck, ‘sustainability’ means: “Having the human, financial, technological, and organizational resources to provide services to meet needs and attain results towards mission on an ongoing basis; and acquiring the organizational and programmatic infrastructure to carry out core functions independent of individuals or one-time opportunities” (Buck, 2015, p. 2). To be sustainable, a program requires a strong and clear identity, a base of engaged constituents, and the resources and funding needed to deliver services and results across time. This service-oriented holistic system perspective can be depicted by three overlapping dimensions (identity, constituents, capacity) whose intersection represents the program’s brand or impact.

A program’s identity includes its description, track record/history, niche, mission, values, and goals, and expected results. Constituents includes groups served, strategic partners, customers, competitors, and those targeted by its marketing/outreach strategies. Program capacity includes its resources (human, financial, technological) and how these are organized to deliver service and results. Capacity is affected by organizational structure, staffing, management/ leadership, and program delivery systems.

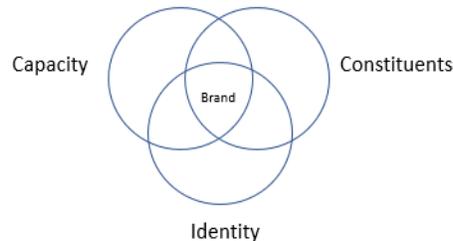


Figure 1: Buck’s (2015) Program Sustainability Framework

Buck’s program sustainability model was developed to provide a comprehensive systems approach for understanding the long-term viability of non-profits, public agencies, and foundations. However, it has the potential to be adapted and applied to other programs, including IS degree programs. Prior IS enrollment management and curriculum modification initiatives can be mapped to elements in Buck’s model even though these were undertaken without the guidance of such a comprehensive program-oriented framework.

According to Buck (2015), a strong and clear identity characterizes a sustainable program; this helps a program attract internal and external support. IS program identity and legitimacy have often been questioned in prior research. Lack of a strong identity can constrain a program’s ability to garner support or ensure the funding/resources needed to deliver services and produce results. Echoes of this can be heard in prior IS enrollment management and curriculum modification research.

Prior Research Viewed Through a Program Sustainability Lens

Considerable prior research has focused on IS identity issues. Prospective majors often have difficulty distinguishing IS from other computing disciplines such as CS and IT (Downey et al, 2009). IS program identity can be further clouded by inconsistency in the college/school that confers the degree and variation in IS department names. While IS programs are most commonly found in business colleges/schools, they are sometimes located in another college/school. Within the business college/school, the IS discipline is often not as well understood as other majors (Somers, 2010). Relative to other disciplines such as accounting and marketing, there is less consensus about the purpose and importance of IS (Firth et al., 2011). This may cause students to perceive other disciplines as “safer” majors (Downey et al., 2011).

Fichman et al. (2104) describe how identity and legitimacy issues can combine with low support to threaten the long-term viability of IS programs. They perceive the presence of negative reinforcement loops at some

schools that has led to the devaluation of IS as a discipline and the dissolution of some IS departments. They note that disagreements among stakeholders about IS identity and legitimacy and low levels of student interest in IS courses can fuel low opinions about the value of an IS course in the business core. Over time, this can result in the IS course being removed from the business core or relegated to a lesser role. This, in turn, results additional negative effects including reductions in IS program resources (faculty) and diminished opportunities to recruit majors. Fichman et al. (2014) argue that bold steps are needed to improve the case for IS in the business core, increase student demand for IS courses, and enhance the legitimacy of IS as an academic program in the minds of stakeholders.

Fichman et al.'s negative reinforcement loops are explainable within the context of Buck's sustainability model. Without legitimacy and a strong/clear identity, an IS program is less likely to attract/maintain the support of key constituents (students, university administrators) or ensure adequate capacity (e.g. faculty resources, financial support). Their recommendations for strengthening IS identity and legitimacy, increasing demand for services (courses) and instructors (resources/capacity) also align with Buck's model.

Buck suggests that strong program identities are facilitated by well-articulated missions, goals, and niches. Many IS programs strive to communicate their mission, goals, or niches on their web sites and university catalogs, but the clarity, strength, and impact of their efforts is debatable. Few IS programs strategically structure their communications to increase legitimacy, constituent support, and program capacity.

Powerful opportunities for strengthening IS program identities may lie in program niches. Establishing or filling a niche can assist in distinguishing IS and other computing disciplines and the business role(s) of IS relative to other business disciplines. Focusing on a niche may strengthen/clarify program identity and legitimacy while also increasing constituent support and capacity (resources). Niche articulation may involve differentiating the program from counterparts at other universities. Some universities have created niche programs by integrating entrepreneurship into their IS curricula (Jones & Liu, 2017; Lang & Babb, 2015). Others have established/filled a niche by focusing their curricula on core transactional systems, such as enterprise systems (e.g. Antonucci et al., 2004) or on "fundamental and powerful concepts" such as digital innovation (Fichman et al., 2014). Significant engagement in a software vendor education alliance (e.g. IBM, Microsoft, Oracle, SAP, SAS, Teradata) may also be used to create a niche. Creating and articulating a niche often requires significant curricula changes, however, such changes are often recommended (e.g., Sanchez-Puchol, 2017) and are consistent with Buck's recommendations.

According to Buck, a program's constituents includes groups served, strategic partners, customers, competitors and marketing/outreach targets. At least six key constituencies can be identified for IS programs including current students, university administrators, employers, other degree programs, alumni, and prospective students (and their parents). Current students are typically considered the primary group served, but university administrators and employers of program graduates may also be viewed as groups served. Strategic partners may include other departments involved in cooperative programs, career services, and employers who consistently offer internships/co-ops or recruit program graduates. Other computing degree programs at the university and IS degree programs at other universities (including online universities) can be considered competitors. Prospective students (and their parents) are frequent targets of IS program marketing/outreach efforts, but alumni may also be targets.

From a program sustainability perspective, it is ideal to have widespread support among stakeholders, however, systematic efforts to positively impact all or most IS program constituents are rare in prior enrollment management and curriculum revision research. While some researchers have recommended program modifications likely to impact multiple constituencies (e.g. Dick et al., 2007; Granger et al., 2007), the majority have focused on impacting a single constituency (e.g. current students) or a limited subset of constituencies. The introductory IS course has frequently been identified as an opportunity to interest students in the IS major (e.g., Akbulut & Looney, 2009; Granger et al., 2007; Firth et al., 2008; Li et al., 2014; McCoy et al., 2010). The introductory IS course provides a potential pool for IS majors when it includes large numbers of "soft commits" to other majors and students who are undecided (McCoy et al., 2010; Whelan et al., 2012). Other recommended actions to increase constituent support include the creation of emphasis areas (e.g. Granger et al., 2007; Koch et al., 2010) and undergraduate certificate programs (Wang & Wang, 2015).

Koch et al. (2010) come close to embracing a program sustainability perspective when they contend that best practices in IS program enrollment management requires a long-term perspective for initiatives designed to attract, retain, and place students. Koch et al. recommend approaches that create a positive cycle in which IS majors become satisfied customers whose recommendations help recruit more majors. Some constituent-oriented marketing and awareness initiatives mentioned in prior research include program identity and legitimacy elements that focus IS professionals add value to the businesses that employ them (Dick et al., 2007; Walstrom & Schambach, 2012). Marketing and awareness initiatives to prospective majors may also feature persistent demand for IS talent (Li et al., 2014) and persistently high starting salaries relative to other university majors (Desjardins, 2018; Dodge, 2018).

Other than the potential resource impacts of negative feedback loops for IS programs (Fichman et al., 2014), the program capacity aspect of Buck's model has rarely been directly addressed by IS enrollment management and curriculum revision research. Buck (2015) contends that program capacity includes how the program is organized to deliver services and produce results; a sustainable program is characterized by persistent funding that ensures adequate resources (human, technological, organizational) necessary for ongoing operations. The absence of explicit capacity considerations in most prior IS education enrollment management research may reflect the need for a more comprehensive systems- and service-oriented systems perspective such as that provided by Buck's model. IS programs often describe their ability to serve constituents by publishing graduate rates, percentage of graduates hired in field, average starting salaries, testimonies from successful alumni, lists of program faculty members, degree program requirements, course descriptions, and four-year curriculum plans. Such descriptions address a fraction of the capacity elements included in the Buck's model, and most capacity considerations are indirect.

Conclusion

The previous paragraphs provide a brief overview of a program sustainability model Buck (2015) and explore the model's potential to be adapted to IS programs. Prior enrollment management and curriculum revision research and IS program characteristics can be mapped to model elements. Preliminary results of a survey of IS program administrators indicate recognition of the importance of elements included in Buck's model. These results suggest that department name, emphasis areas, internship/co-op opportunities, and certificate programs contribute to program identity and support. The findings also suggest that employers, program advisory boards, alumni, and university job placement services are key stakeholders. We believe that Buck's model and other program sustainability frameworks have the potential to be adapted and usefully applied to IS programs and can provide guidance for future IS enrollment management and curriculum revision research. A systems-, service-, and sustainability-oriented framework like Buck's may help IS programs to strengthen their identities and increase their robustness in changing environments.

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