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Abstract:

In June, 2019, the Association for Information Systems (AIS) adopted a new approach to addressing global sustainability issues by establishing the AIS Sustainability Task Force (AIS STF). This initiative focuses on building on the outcomes from the United Nations (UN) Millennium Development Goals (MDG, 2000-2015) and applying them to address the challenges associated with the UN Sustainable Development Goals (SDG, 2016-2030). In this paper, we review the challenges and outcomes from the UN sustainability programs with their potential relevance to IS in general and the AIS in particular to inform and assist increased efforts to achieve the global sustainability goals. The initial event, the AIS Sustainability Summit held at ICIS 2019, provided a forum for AIS groups and communities to share their current interests, plans, activities, and experiences relevant to the MDG and SDG. The event primarily focused on facilitating opportunities to scale the AIS's sustainability activities through multi-disciplinary collaboration across the AIS and its communities. Members from four AIS special interest groups and the STF's Education Workgroup presented exemplary projects at the summit that demonstrated how one can apply applied IS and research capabilities to address sustainability challenges. The sustainability summit's also explored opportunities to achieve positive impact in addressing the SDG's global challenges through applying AIS members' knowledge, skills, and capabilities in relevant ways in collaboration with suitable organizations outside the AIS. Potential organizations include business, government, societal groups, and UN bodies. We presented and discussed the AIS STF's aims, plans, outcomes, and impact. By analyzing details and options for cross-organizational collaboration, the representatives of organizations at the sustainability summit developed a proposed framework for scaling contributions and evaluating impact. Finally, they drew conclusions about the proposed activities, approaches, and framework for the AIS to improve the scope and scale of its contributions in addressing the SDG. Critically, the AIS needs to ensure that its proposed activities, contributions, and impact are examined by an internationally recognized independent process. We propose a model for the AIS to realize this requirement for evaluation in 2021.

Keywords: Sustainability, Sustainable Development Goals, Smart villages, Geographic Information Systems, Education, Analytics, Big Data

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1 The First AIS Sustainability Summit

In this report, we analyze presentations to the Association for Information Systems (AIS) Sustainability Summit at the 2019 International Conference on Information Systems (ICIS) that four AIS groups and the Education Workgroup from the AIS Sustainability Task Force made. As a result, Dennis supported the summit on which we report.

Prior to the summit, we approached SIGs and communities to seek their involvement. We provided a common structure for each presentation to the SIGs and communities who agreed to participate to ensure consistency despite the diversity of approaches and outcomes. We summarize the main points during the summit for readers' convenience in Section 1.1 below.

1.1 Summit Thoughts

The conference summit inspired thinking about actions that the AIS could take, and we recorded the following thoughts while listening to the presentations:

- Could groups of AIS members or maybe IS departments adopt some remote villages and provide funds to make them smarter? IS scholars could do comparative studies across villages to learn how to create and foster smart villages.
- Sustainability constitutes an information intensive problem, and it can provide many examples for classroom teaching.
- Many sustainability problems require one to analyze spatial-temporal data, and such data should become more prominent in data management and data analytics classes.
- The socio-technical systems (STS) concept underlies much IS scholarship and teaching, and we need to shift to a socio-technical-ecological system foundation (STES) (Ahlborg, Ruiz-MercadoMolander, & Masera, 2019). We need to incorporate STES needs into all introductory IS courses and others where relevant.
- Female leaders appear more concerned with ecological sustainability than males. This finding potentially raises questions about how the AIS could prepare more women for leadership roles to have a positive impact on sustainability decisions.
- Since 2019, the AIS has increased its commitment to sustainability. The initial Sustainability Summit at ICIS 2019 demonstrated significant interest in and across the AIS community in achieving a positive impact on the United Nation's Sustainable Development Goals (SDGs). The AIS must address how it can best sustain an increased commitment, and scholars need to address how they can best assist the AIS to become an acknowledged leader in creating a more sustainable society.

2 Sustainability Challenges

2.1 UN Millennium Development Goals (MDG, 2000-2015)

In September, 2000, the United Nations' Millennium Summit took place in New York and released a set of global goals. The Millennium Declaration's objectives include promoting peace, security, and disarmament; strengthening the rule of law; and providing the UN with the resources necessary to prevent conflict and to peacefully resolve disputes.[1]

In total, 149 heads of state with high-ranking officials from more than 40 other countries attended the summit. They unanimously adopted the Millennium Declaration.

[1] https://www.un.org/millenniumgoals/

The national leaders who attended the summit also committed their countries to a new global partnership that would, by 2015:

1) Reduce extreme poverty and hunger
2) Achieve universal primary education
3) Promote gender equality and empower women
4) Reduce child mortality
5) Improve maternal health
6) Combat HIV/AIDS, malaria, and other diseases
7) Ensure environmental sustainability, and
8) Develop a global partnership for development.

These eight objectives—the UN Millennium Development Goals (MDGs)—focused on global policies and measures that relate to what developing countries and economies in transition require (United Nations, n.d.-a).

In 2015, a review of global progress on the MDGs (MDG Gap Task Force, 2015) since 1990 found that:

- The number of people living in extreme poverty declined from 1.9 billion to 836 million
- The proportion of undernourished people in the developing regions declined by almost a half
- The number of primary school age children who did not attend school declined from 100 million to an estimated 57 million
- Most countries achieved gender parity in primary school
- The mortality rate of children under five declined by more than half
- The level of maternal mortality declined by 45 percent worldwide
- Over 6.2 million malaria deaths had been averted
- New HIV infections declined by approximately 40 percent between 2000 and 2013
- By June, 2014, 13.6 million people living with HIV received antiretroviral therapy (ART) globally, an immense increase from just 800,000 in 2003
- Between 2000 and 2013, tuberculosis prevention, diagnosis, and treatment interventions had saved an estimated 37 million lives
- 2.1 billion people had gained access to improved sanitation
- 147 countries met the MDG drinking water target, 95 countries met the MDG sanitation target, and 77 countries met both, and
- Official development assistance from developed countries increased 66 percent in real terms from 2000 and 2014 to reach US$135.2 billion (United Nations Development Programme, 2015).

2.2 The UN Sustainable Development Goals (SDG 2016-2030)

While developing countries achieved unprecedented levels of improvement in areas that the MDG targeted, they did not completely address all challenges that they faced. More developed countries also experienced issues in areas that the MDGs targeted. Note that the more developed countries pledged funding for the MDGs (i.e., the US$135.2 billion). Broader and more comprehensive development goals will likely require substantially more funding with significant contributions from business, societal groups, and governments.

The United Nations General Assembly promulgated the UN Sustainable Development Goals (see Figure 1) in 2015. All UN member states adopted the goals as a universal call to action to end poverty, protect the planet, and ensure a better and more sustainable future for all by 2030. The 17 SDGs balance social, economic, and environmental sustainability. These global goals' integrated nature means that action in one area will also impact outcomes in others. The SDGs identify research themes for AIS scholars interested in creating a sustainable society. Presentations at the AIS Sustainability Summit referred to these SDGs as critical signposts for our collaborative efforts.

Figure 1. UN Sustainable Development Goals (United Nations, n.d.-b)

Unfortunately, despite countries' success in tackling the MDGs, they made disappointing progress on the SDGs in the first five years. In its most recent Sustainable Development Goals Progress Report in 2020, the United Nations noted that "progress remained uneven and we were not on track to meet the goals by 2030" (UN SDGPR, 2020, p. 2). Due to the coronavirus disease of 2019 (COVID-19) pandemic, the global situation has become much worse. The report goes on to note:

> *Health systems in many countries have been driven to the brink of collapse. The livelihood of half the global workforce has been severely affected. More than 1.6 billion students are out of school, and tens of millions of people are being pushed back into extreme poverty and hunger.* (p. 2)

Research has established that technology, which includes information systems, has had a positive impact on the MDGs and SDGs. (UN FCCC, 2016). This process enabled the countries to identify how they could apply technologies to address climate change and, subsequently, to enable national development; to develop the capacity to support sustainable development; and to prepare plans for implementing appropriate technologies. This process has also assisted other countries by demonstrating technologies' viability for specific purposes.

The positive impact of technology, including Information Systems, on the UN MDG and SDG, is well established. Examples include the UN's Framework Convention on Climate Change's technology transfer framework in which developing countries undertook a technology needs assessment (TNA) to identify their priorities for climate technology (UN FCCC, 2016). This process enabled countries to: (1) identify how technologies could be applied to address climate change and subsequently to enable national development; develop the capacity to support sustainable development within each country; and (2) prepare plans for implementing appropriate technologies. This process also assists other countries by demonstrating the viability of nominated technologies for specific purposes.

IS practitioners worldwide will recognize the applicability of a TNA as they are well established in the IS discipline. Research has shown their effectiveness in many organizations. The scope of traditional IS research encompasses these activities. However, they have a global scale: not just organizations or industries but countries and continents. The following quotes illustrate this global scale: "since 1999, more than 85 developing countries have assessed their technology needs to address climate change" (UN FCCC, 2016, p. 7) and "since 1991, the UNFCCC's Global Environment Facility has supported developing countries to implement more than 800 projects with climate mitigation technology transfer objectives, over US$5 billion of funding and US$40 billion of co-financing" (UN FCCC, 2016, p. 8)**.**

3 IS and Environmental Sustainability

Information systems have significant impacts on environmental sustainability at three levels (Dedrick, 2010): 1) first-order effects, 2) second-order effects, and 3) third-order effects. First-order effects refer to direct impacts that arise from producing and using information technology (IT) hardware and disposing computer equipment. These effects harm environmental sustainability. Using and producing IT consumes a significant amount of energy, which generates carbon emissions. For example, data centers constitute a rapidly growing source of carbon emissions. These negative effects form the basis for the green IT view, which sees IT primarily as a problem to mitigate. Second-order effects refer to the impact that using information and communications technologies (ICTs) has on other processes, such as energy production and distribution, transportation, logistics, and supply chain management. These second-order effects form the basis for the green IS view, which sees ICTs as a possible solutions to environmental problems. For example, using smart grid technology mitigates greenhouse gas emissions by making electricity generation and distribution more efficient. One can use ICTs to make many processes smart and green by increasing energy efficiency through aligning supply and demand systems and reducing energy consumptions. Third-order effects have a more long-term and more dynamic nature and broader implications. These effects occur with the widespread ICT use, which can create socio-economic changes, such as changes in lifestyles and economic structures. For example, wireless sensor networks built on Internet of things (IoT) systems enable smart (or greener) cities by collecting environmental data and analyzing them in real time. Autonomous (electric) vehicles may also make the environment greener by influencing traffic congestion and routing patterns.

The second-order and third-order effects that we discuss above require one to collect and analyze data for sustainability. Thus, one requires a common information system to provide a cohesive solution by integrating data collected from various sources and involving multiple parties to interoperate and collaborate (Watson, Boudreau, & Chen, 2010). Indeed, Melville (2010) highlights the need for a common information system in staying:

> *The organizational adoption of sustainability strategies necessitates new data regarding environmental impacts, new information about causes and effects, and knowledge sharing about what works, what doesn't, and why.* (p. 2)

In this paper, we report on actions that SIG Global Development (SIGGlobDev), the Sustainability Education Workgroup, SIG Geographic Information Systems (SIGGIS), SIG Decision Support and Analytics (SIGDSA), and the AIS Women's Network College. We conclude with some recommendations based on the summit, post-summit conversations, and reports on the MDGs and SDGs that inspired us to further engage AIS in sustainable research, teaching, and conferences.

4 SIGGlobDev and Smart Villages[2]

Actors across the developing world and particularly actors in remote locations such as Nepal and Bhutan have widely recognized ICT's development potential (Aitkin, 2009; Heeks & Kanashiro, 2009). The question no longer concerns whether ICT can lead to development but how it can be applied most effectively and in a way that ensures value for society. If we analyze development goals from the SDGs' perspective, the issues are complex, interrelated, and interdependent (Robert, Parris, & Leiserowitz, 2005). (Capra & Luisi, 2014; Raworth, 2017).

The "Smart Village" initiative in rural Nepal, a development initiative under the Nepal Wireless Networking Project (NWNP) (Thapa, 2012), merges local and indigenous knowledge based on villagers' collective insights with experts' socio-technical knowledge to design, develop, and implement ICT-based solutions to solve pressing developmental challenges. As the project remains in its early design stages, it offers a unique opportunity to understand and contribute to designing, developing, and implementing sustainable development. Smart village researchers have particular interest in the organic, bottom-up developmental model that the Smart Village initiative represents. Earlier work on NWNP (Thapa, 2012) showed that, to succeed, the initiative would require organic development from the grassroots. There are two theoretical streams for this research: the theory of affordances and social capital theory. The affordances concept can provide a lens to better understand the process by which ICT can lead to development (Thapa & Sein, 2018). Social capital depends on trust, reciprocity, and exchanges (Thapa, Sein, & Sæbø, 2012)—

[2] Devinder Thapa wrote this section and it pertains to his research.

characteristics that can have direct or indirect implications for how actors perceive and actualize affordances. The research will take a qualitative approach. It will conduct interviews with design team and key stakeholder groups and conduct focus groups with specific village-level user groups. It will also use participant mapping (Emmel, 2008) to capture key user and designer groups' authentic voices and experiences.

Figure 2. The Nepal Wireless Networking Project

4.1 Link to the UN's Sustainability Goals and Relevance

This initiative aims to create a collaborative space for multifaceted development through transforming health, education, communications, income-generating opportunities, governance, and disaster management using ICTs. Specific examples include smart agricultural cooperatives that connect to local businesses and then to commercial banks. The initiative also has a high potential to empower women. For instance, telemedicine in rural Nepal retains a central role for "village health sisters", and the project aims to enhance their capabilities through tele-education. The conceptualization clearly implies that the "Smart Village" initiative lies at the intersection of poverty reduction (SDG 1), quality education (SDG 4), reduced inequality (SDG 10), and sustainable cities (villages in this context) and communities (SDG 11). One can see the fragility of Nepal's environment and its distressing consequences in recent landslides in and around Mount Everest and in the earthquake that killed hundreds and created massive economic pressures. The research will focus on understanding the affordances of digital tools for local communities in addressing disaster-related challenges. For example, the study will consider smart early landslide or flood warning systems and emergency communication services for disaster preparedness.

4.2 The Position of the Topic in Relation to the Research Frontier

On the research front, this work will extend the traditional way in which researchers have framed ICT as a technical tool to "ICT affordances" (Sein & Harindranath, 2004; Zheng, Hatakka, Sahay, & Andersson, 2018). While researchers have widely applied the concept to understand IS-associated organizational change, the plan is to extend it to the societal level—a more challenge research approach due to its complex social, political, cultural, and environmental configurations (Hatakka, Thapa, & Sæbø, 2020). We propose social capital as a basis for collective action to enhance development opportunities through involvement and participation in group activities. The theoretical lenses we propose to use will be helpful in understanding technology's multifaceted social implications. The findings may augment existing models such as the United Kingdom's UK Department for International Development's (DFID) sustainable livelihood framework (Krantz, 2001) by providing insights on how aid agencies can identify actors and help them to perceive affordances and actualize them towards development goals. On the practice front, the researchers plan to continually feedback the findings and insights to the Smart Village project team to help the research team further develop relevant ICT design goals to maximize the beneficial impact of the development intervention. The lessons we will learn from this study will provide guidelines to assist similar sustainable development initiatives.

5 Sustainability and the Education Workgroup[3]

5.1 About the Education Workgroup and AIS Sustainability Task Force

The AIS Sustainability Task Force initiated the Education Workgroup because:

> *Building awareness of sustainability challenges in business is an urgent requirement. Collaboration across the AIS SIGs for the design and development of curricula and educational resource materials in sustainability fields will lead to sharing those materials among members locally, nationally and internationally. AIS members in universities will be encouraged to demonstrate leadership with public engagement, policy development and advocacy and participation in government, industry or societal initiatives.* (AIS Sustainability Task Force, n.d.).

Jacqueline Corbett and Jane Webster coordinate the group, while Ali Feizabadi serves as the project lead for Canada, Iran, and Ghana.

5.2 Objectives

The workgroup aims to ensure that all IS program graduates have the necessary basic knowledge and skills to deal with critical sustainability issues that we face today and will face tomorrow. This objective acknowledges that, while educational requirements may have similar content, courses may need to be specific to cultures, languages, levels, and regions in and across countries. Consequently, the workgroup initially focused on conducting research to identify the educational resources and course offerings in different regions and countries. In the future, the workgroup plans on creating courses or course modules as required.

Developing and sharing educational resources would be cost effective. This approach would also assist in growing resources in high-interest and high-demand areas (e.g., in emerging sustainability practices and developing technologies). Case studies relevant to technology-enabled sustainability in practice would also be very important.

Where available and effective, relevant frameworks already developed can provide valuable resources. For example, the UN's Principles for Responsible Management Education (PRME, 2007) focus on "rais[ing] the profile of sustainability in schools around the world, and equip[ing] today's business students with the understanding and ability to deliver change tomorrow".

5.3 Scope and Stakeholders

To achieve its objectives as set out above, the workgroup needs to work with various stakeholders both in and outside the AIS to build awareness of the challenges of sustainability and develop capabilities to address those challenges.

In the AIS:

- AIS members
- AIS's special interest groups and colleges including: AISWN College, SIGDSA, SIGED, SIGGIS, SIGGreen, SIGGlobalDev, and others

Outside the AIS:

- Business and business groups
- Government and semi-governmental organizations and groups
- Societal organizations and groups for social inclusion
- Professional bodies
- Philanthropic organizations

[3] Jacqueline Corbett, Jane Webster, Ali Feizabadi wrote this section.

5.4 Major Challenges

The major challenges that the workgroup identified include:

- Research on existing course offerings around the world requires dedicated people to collect data and analyze the data. Thus, the workgroup requires funding.
- One cannot easily find collaborators in different regions who can follow a standard process for data collection.
- Expanding the research to other regions requires people who have knowledge about local educational systems and languages.
- Universities do not necessarily publish up-to-date information on websites, which makes collecting data challenging and affects results' quality.
- Inconsistent data types across universities in different regions and countries make comparisons more difficult.

5.5 Initial Findings and Potential Collaboration Opportunities

5.5.1 Initial Project

The workgroup's initial project, which it completed in 2019, built on past research, such as 2018 survey of Australian business school students' views about sustainability and a 2017 U.S. content analysis of undergraduate business school courses. The workgroup conducted comprehensive studies in three countries on three continents: Canada, Ghana, and Iran. The workgroup selected countries deliberately diverse to establish differences in development, language, region, and requirements. Country comparisons identified dissimilarities in education level (e.g., course, module, certificate, major) and nature (e.g., centers, internship), type of courses in business schools (e.g., IS/IT, accounting, economics, law, marketing, strategy), and so on (see Figure 2).

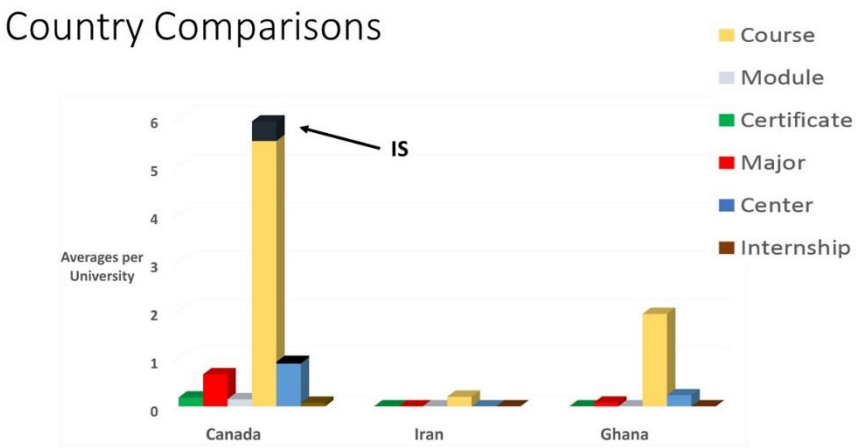

Figure 2. Results of the Sustainability Education Workgroup

This initial project's outcomes demonstrate that:

- Canada seems to offer more sustainability courses than Ghana and Iran on both an absolute and per university basis.
- There were no majors or minors in sustainability in IS programs in the three countries (at the time of the data collection).

In business schools in Canada:

- A small percentage (7.4%) of sustainability courses relate to IS or operations.

- The sustainability courses operated at the undergraduate level (53%), in professional programs such as a Master of Business Administration (MBA) (30%), or at the graduate research level (17%).
- The project found noticeable differences in the number of courses between Canada's different regions likely based on local concerns.

The project observed some connections between the course offerings and the United Nation's SDGs but to a limited degree; thus, the findings encourage stronger links.

5.6 Future Activities

The workgroup plans to build on the initial project and conduct an international comparative research study into sustainability research. In doing so, we plan to engage AIS researchers across countries and regions. More specifically, in the future, the workgroup plans to:

- Actively recruit research teams to complete the census (data collection) in three additional countries.
- Work collaboratively with AIS and members to further develop a database tailored to the project's needs
- Develop a roadmap for identifying core skills, knowledge and competencies related to sustainability education in IS.
- Establish collaborative partnerships with other AIS groups and interested SIGs.

6 SIGGIS and Sustainability[4]

6.1 The Special Interest Group on Geographic Information Systems (SIGGIS)

Geographic information systems (GIS) provide the capability to integrate location in an IS and, thereby, improve IS applications by enhancing their accuracy, efficiency, knowledge, and intelligence (Farkas et al., 2016). Founded in 2010, SIGGIS has a mission to:

> *Be a forum that brings together members of AIS to discuss, develop ideas and promote research, stimulate curriculum and teaching, and dialogue on the role of spatial information systems, technologies and concepts, as applied to management of information systems, business intelligence (BI), decision support systems (DSS), and knowledge management (KM).* (Special Interst Group on Geographic Information Systems, n.d.)

As a midsize SIG with more than 50 members, SIGGIS can contribute to and impact the IS community by using its members' expertise, providing educational outreach, and collaborating with other SIGs on sustainability projects. SIGGIS core members have worked on various projects, and they published a GIS tutorial update in the *Communications of the Association for Information Systems* (*CAIS*) in 2016 (Farkas et al., 2016). In a current project, members study GIS and location analytics research and teaching in business schools. SIGGIS has also involved and collaborated with corporate partners and received support from ESRI and IBM.

Educational outreach, a major SIGGIS focus, has comprised mini-tracks at the Americas Conference on Information Systems (AMCIS) and annual workshops at both AMCIS and the International Conference on Information Systems (ICIS) since 2014. Approximately 25 percent of workshop papers have environmental themes. The AIS eLibrary contains all the papers. Since its founding, SIGGIS has had a website to disseminate SIG news.

Finally, location analytics and GIS represent core technologies across many disciplines. SIGGIS lies in the perfect position to collaborate with other SIGs in moving the United Nations' SDGs forward. For example, the SIGGIS successful collaborated with SIGDSA developing and participating in a location analytics panel at the 2017 ICIS in Seoul, Korea.

[4] Dan Farkas and Namchul Shin wrote this section.

6.2 GIS as Platform and Sustainability

A GIS refers to an information system that manages and analyzes geographical (or location) data and that visualizes that data integrated (or overlaid) with other types of data, such as demographic data. For example, to improve the impact that supply chain management has on the environment, GIS plays a key role in helping organizations identify eco-routes and eco-efficient supply chains by analyzing site selection for warehouses, mixing centers, and distribution centers. GIS can also serve as a common platform that integrates people, processes, things, cities, societies, environments, and data about them and, thereby, generate insights for sustainable development. Location (or spatial) data comprises much of the data that organizations collect from the IoT (or so-called big data). Thus, aligning Melville's (2010) and Watson et al.'s (2010) viewpoints with the impact that GIS have on environmental sustainability, we posit that organizational adoption of sustainability strategies necessitates new location data regarding environmental impacts, new location information about causes and effects, and knowledge sharing about what works, what does not, why, and where. We also postulate that sustainability requires organizations to collect and analyze location data and to use a common platform.

SDG 1 (i.e., no poverty; see Figure 1) suggests that economic growth must be inclusive to provide sustainable jobs and promote equality and that we must end poverty in all its forms everywhere. However, more than 700 million people (10% of the world's population) still live in extreme poverty (i.e., on less than US$1.90 a day), while more than half (55%) of the world's population have no access to social protection. GIS can help identify suitable locations to target efforts to eradicate poverty. For instance, we used ArcGIS Online (a Web-based GIS tool) and visually analyzed (mapped) the global poverty data to identify locations that require more assistance (see Figure 3).

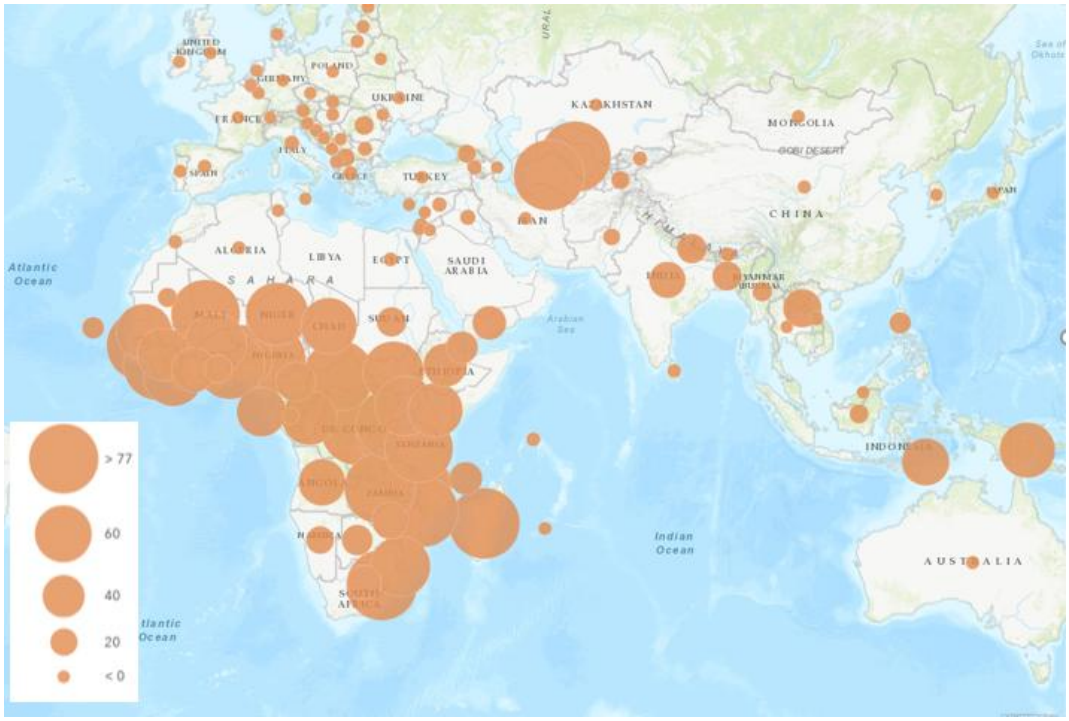

Figure 3. Global Poverty (Percentage of the population) (Cappelli, 2018)

One can see significant poverty levels in Sub-Saharan African and some Asia-Pacific countries, such as Turkmenistan, Uzbekistan, and Papua New Guinea. While this exploratory visual analysis clearly shows where to target the efforts to end poverty, a GIS can further one's investigation by integrating poverty data with other types of data, such as children engaged in economic activity[5]. We visualize the second data layer (children engaged in economic activity) (Figure 4) and then integrated it with the poverty data, which we show in Figure 5.

[5] Children engaged in economic activity relate to SDG 16 (i.e., "peace, justice and strong institutions". The goal focuses on reducing violent crime, sex trafficking, forced labor, and child abuse.

It appears that child involvement in economic activity is associated with poverty. However, when one integrates the two data layers (see Figure 5), an interesting pattern stands out: countries such as India and Turkmenistan have relatively high poverty rates, but they have low proportions of children working[6]. On the other hand, countries such as Mongolia and Serbia have relatively low poverty rates but high child engagement in economic activity. By using GIS to visualize and integrate data, we can find countries with high poverty rates and high rates of children at work. We can also identify the most problematic areas that international efforts should focus on the areas where children face challenges not just from poverty but also from some other reasons such as child trafficking or forced labor.

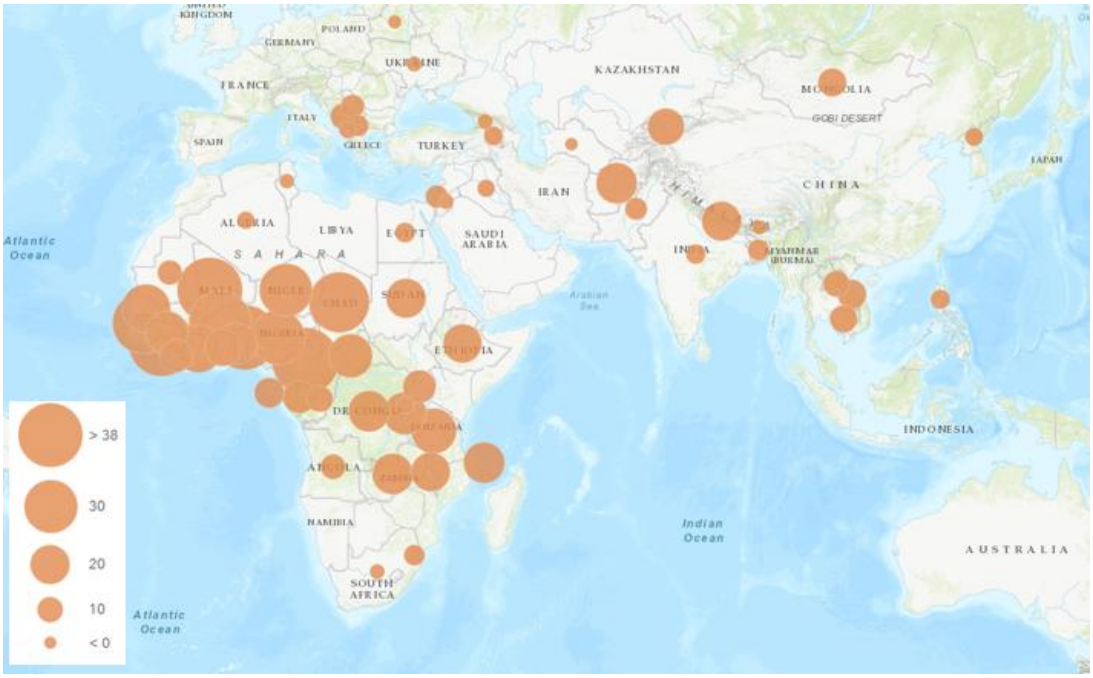

Figure 4. Children Engaged in Economic Activity (Percentage of the total number of children in the population) (Cappelli, 2018)

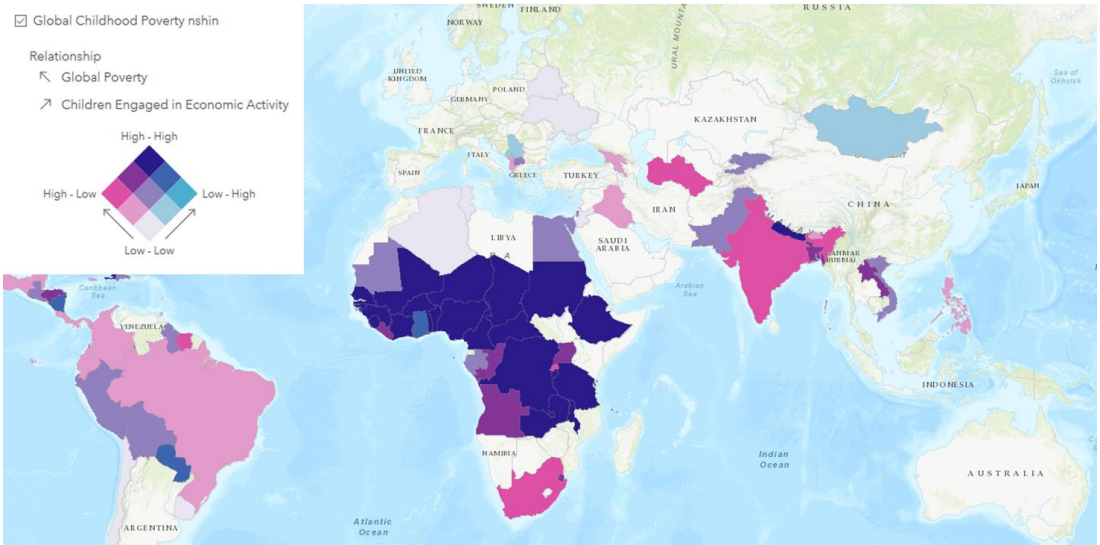

Figure 5. Global Childhood Poverty (Cappelli, 2018)

[6] In Figure 4, pink indicates a country with high poverty rates and a small percentage of children at work, while light blue indicates a country with low poverty rates and a large proportion of children working to support themselves and their families.

6.3 Consortium as a Platform

In Section 6.2, we illustrate how one could use GIS to integrate the data on the first (no poverty) and sixteenth SDGs (peace, justice, and strong institutions) and provide insights for making the right decisions and taking meaningful actions. The SDGs focus on addressing persistent societal problems, and GIS can help solve these issues by integrating various data sources and visualizing them to identify which locations (regions or countries) have the most severe problems.

We propose that we need to develop a consortium for collaborating and sharing data to tackle grand challenges such as the SDGs. As an institutional form, a consortium can deal with complex problems better compared to other arrangements such as hierarchical or market-based institutions. We also view a consortium as a common platform that can deal with innovation ecosystems. Such innovations should involve the entire system—not just single organizations but multiple organizations (or countries). They also encompass ambiguities associated with complexity and incorporate long-term horizons since the knowledge needed for innovation emerges unpredictably and over a long time.

A socio-technical system (STS) refers to an open system that is embedded in an environment that affects the way it behaves (Mumford, 2006). Technical and social structures coevolve in a socio-technical system, which takes a long time. More recently, researchers introduced the socio-technical-ecological system (STES) concept by including the ecological dimension into the socio-technical system (Ahlborg et al., 2019). A consortium as a platform can address innovation ecosystems or socio-technical systems (or socio-technical ecological systems) by encouraging and governing cross-organizational collaboration and open data sharing and by dealing with the co-evolution of technical, social, ecological systems, which require integrated solutions to solve complex problems.

6.4 Major Challenges

SIGGIS focuses on collaborating with other SIGs and projects and on providing GIS expertise and guidance where appropriate. We must address several challenges to implement an active collaborative program that supports the UN's SDGs. First and foremost, many prospective collaborators do not sufficiently understand GISs' potential to enhance and inform SDG projects. While GIS is a potent visualization tool, it also provides significant analytic and collaborative capabilities as well. One challenge will be to educate community members on how they can use GIS to augment most projects. Second, we need to develop and implement a collaborative platform for sharing ideas, documents, and solutions, which will require a multi-sided platform solution with GIS (e.g., ArcGIS Platform) at its core. Third, we need to build a collaborative community that would comprise AIS members, specific SIGs, and, to some extent, the external community. To do so, we would need to build a sustainability website for all participating SIGs. Lastly, we would need financial resources to build infrastructure (collaboration platform, website, licenses, etc.) and ensure participants can make time to work on these projects. Such financial resources could include incentives, such as grants.

6.5 Outcomes

We plan to build a consortium (collaborative community) working to support the UN's SDGs. To begin, we could assess the expertise, interest, and knowledge that already exist. We propose to preliminarily survey SIGs and AIS members to assess the extent to which they understand and use GIS as both a tool for analysis and visualization and what the community thinks about incorporating it into SDG projects. We could construct a similar survey once projects have begun to assess any changes in GIS understanding and use.

6.6 Planning: The Next 12 Months and Beyond

Ideally, the next 12 months would kick-start an ongoing process. In addition to the survey mentioned above, we propose to:

1) Create an AIS "community" that would serve as to coordinate the AIS's activities related to the SDGs, which would include a website, landing site, and information hub.
2) Reach out to other SIGs who would be interested in collaborating (e.g., joint panels, workshops, etc.).
3) Reach out to other SIGs to provide education on GIS through workshop seminars and webinars. SIGGIS has built up some experience in this area for the past few years.

4) Design a framework for a robust inter-organizational platform for collaboration and openly sharing of data.
5) Reach out to organizations to explore collaboration in areas of shared interests.

7 SIGDSA[7]

7.1 SIGDSA and its Collaborators

The Special Interest Group for Decision Support and Analytics (SIGDSA) (formerly SIGDSS) provides networking opportunities for people who conduct research, develop, and/or teach topics related to all analytics, artificial intelligence (AI), data science, decision support, big data technologies, knowledge management, or data management systems that support managers and decision makers and solve problems that individuals, organizations, and society find relevant.

SIGDSA conducts an annual symposium as an ancillary event with ICIS. In these events, SIGDSA has partnered with Industry (Teradata, Dataiku, SAS, IBM, etc.), other SIGs such as SIGGIS and SIGED, and communities such as IFIP and the German IS Society. Participants discuss decision analytics models and its validation, theory, practice, methods and techniques, new developments, and applications of computing technologies to support decision processes and decision-making at different hierarchal levels - by individuals, groups, and organizations.

7.2 Objectives

SIGDSA focuses on helping AIS members and the larger IS/IT practitioner and scholar community exchange, develop, communicate, and disseminate information about decision support, analytics, collaboration, and knowledge management research and teaching issues in business, management, and organizational contexts.

In 2020, SIGDSA addressed the theme “Analytics for Addressing Grand and Global Challenges”. The meeting focused on providing a leading international forum for analytics researchers to present their research on related topics and networking opportunities that could lead to fresh ideas among scholars from varied background and skills. Given increased focus on the COVID-19 pandemic, this meeting had a dedicated section on World Health Organization (WHO)-related sustainability goals and analytics approaches for tackling a pandemic.

7.3 SIGDSA as an Academic Platform

SIGDSA fosters academic research by working with journal and book editors to arrange special issues in journals, edited book volumes, and fast-tracked journal publication opportunities for its community members. Early-stage papers appear in a dedicated track at AMCIS and a symposium collocated with the ICIS. Proceedings from both tracks appear in the AIS library. In conjunction with SIGDSA, *Annals of Information Systems* has published such collaborations as special issues of edited book volumes. Another SIGDSA meeting resulted in a special issue in *Decision Support Systems* with SIGGIS. A special issue on analytics for societal benefits in *Information Systems Frontiers* constitutes a third special issue more closely tied to the AIS Sustainability Summit (Gupta, Deokar, Iyer, Sharda, & Schrader, 2018). Future SIGDSA meetings could offer collaboration through journal and book chapter publication opportunities such as through fast tracking papers in *Journal of Business Analytics* or new book volumes in the new analytics book series *Advances in Analytics and Data Science* that Ramesh Sharda and Hsinchun Chen edit.

7.4 Shared Sponsorship from Industry and Academic Institutions

SIGDSA activities do not only support research collaborations or scholarly publications. Rather, SIGDSA engages with various academic institutions and industries that offer sponsorship opportunities and presentations by analytics experts from various businesses. In doing so, SIGDSA helps bridge the industry-academic gap and improves on the SIGDSA’s annual symposium’s relevance to practice. For example, Teradata University for Academics (formerly Teradata University Network) collaborates with SIGDSA in various meetings and assists with inviting international reputable speakers.

[7] Ashish Gupta, Lakshmi S. Iyer, Sagnika Sen, and Ramesh Sharda wrote this section.

7.5 Scope and Stakeholders

In January, 2020, SIGDSA leadership surveyed its members to collect information on research that address the SDGs. We summarize some studies that specifically address specific UN sustainability goals in Table 1 to illustrate such research.

Table 2. Representative Sample of Research that SIGDSA Members have Conducted to Address the SDGs

SDG	Representative samples of SIGDSA research
No poverty	Mobile payments and related issues in developing economies to promote sustainable development (Pal & Herath, 2020).
Affordable and clean energy	Data analytics to predict enhanced energy efficiency in the residential sector with smart meters (Hopf, Sodenkamp, & Staake, 2018).
Decent work and economic growth/ reduced inequalities	The gig economy's growth has given rise to the concerns about the urgent need for new regulations and policies relating to the growing gig worker population who engage in work on or through Internet-based platforms. The study gives voice to gig workers by deeply analyzing their values in an increasingly prevalent type of gig work, crowdsourced micro tasks.
Industry, innovation, and infrastructure	Analyzing detailed narratives from 210 crowd workers participating in Amazon's Mechanical Turk (MTurk), Deng, Joshi, and Galliers (2016) studied nine values: access, autonomy, fairness, transparency, communication, security, accountability, making an impact, and dignity. The study contributes to the gig economy and value sensitive design literatures, heightens awareness of worker marginalization in platform work, offers guidelines for improving the crowdsourcing practice, and calls for improving digital platform design for greater worker empowerment.
Sustainable cities and communities/climate action	Hopf, Riechel, Sodenkamp, and Staake (2017b use public statistical data and predictive models to demonstrate transferability to different geographic regions. Based on design science research, Hopf, Kormann, Sodenkamp, and Staake (2017a) show how one can use open geographic data (e.g., OpenStreetMap) to assess the potential electricity production of roofs without using expensive remote sensing trials. Kozlovskiy, Sodenkamp, Hopf, and Staake (2016) demonstrate large-scale detection of households with old heating systems using energy informatics. MacDonald, Iyer, Kowalczyk, and Gilfillan (2019) use cluster carbon emissions from select countries and compare policy to drivers of emissions for each country based on the Kaya Identity.
Responsible consumption and production	In their interdisciplinary work, Rybnytska, Burstein, Rybin, abd Zaslavsky (2018) demonstrate how to design a decision support system (DSS) for waste management decisions. Their findings illustrate parameters that one should consider when developing DSS for waste management. They present an illustrative example that includes model-based results.

7.6 Major Challenges

- Logistical challenges
  - Reaching stakeholders (language, communication, and other obstacles)
  - Data (volume, source, how to, frequency, collection and compilation, quality, integrity, design
  - Resources (grants and other forms of funding); project sustainability once pilot funding runs out.
- Design challenges for implementation
  - Creating a coordination architecture, which may require multiple stakeholders with different levels of access and familiarity with technology
- Governance challenges
  - The decision support framework often may need to involve agencies with conflicting objectives
  - Mechanisms for accountability
  - (Lack of) policies and regulations

From the decision support and analytics perspective, one faces several kinds of challenges in conducting research that focuses on addressing the SDGs. First, logistical issues around data collection and analysis pose a significant obstacle. Often, one cannot easily appropriately identify the primary stakeholders to

assist. Once identified, physical access may be difficult due to remote geographic locations. Also, language and trust barriers may exist between researchers and communities. These factors complicate the data-collection process and, thus, impact data's volume, quality, and integrity. From researchers' perspective, an assurance for resources necessary for conducting the research beyond the pilot phase (through grants and other means) always remains a challenge.

Second, once researchers achieve an analytic solution to a "wicked" problem, they face design challenges to effectively implement it. All areas that the SDGs cover involve multiple layers of stakeholders at different economic strata with different levels of access and familiarity with technology. Thus, to succeed, any data analytic project needs to design and implement a robust coordination infrastructure to help stakeholders in the decision-making process.

Finally, researchers face governance challenges. The decision support framework often may need to involve agencies (government or others) that may have conflicting objectives. Consequently, researchers need to incorporate appropriate mechanisms for ensuring accountability into the framework.

7.7 Potential Collaboration Opportunities Inside and Outside AIS

In addition to collaborating with other SIGs affiliated with AIS, SIGDSA has been actively involved with developing collaborations associations not affiliated with AIS. For example, in 2019, the Pre-ICIS SIGDSA Symposium in Munich collaborated with Gesellschaft für Informatik, the German society that represents 20,000 computer science educators and researchers. In 2016, the pre-ICIS SIGDSA Symposium collaborated with IFIP WG8.3.

While such forums provide the opportunity to develop cross disciplinary research cultures, SIGDSA actively supports research that uses analytics approaches to solve grand and global challenges (e.g., research that addresses sustainability approaches for water management, protecting citizens from misinformation threats, understanding AI's unintended consequences, etc.). We have embarked on a new project with Basant Maheshwari from the University of Western Sydney. Under a grant funded by Australia's State Revenue Office (SRO), he has launched a program to get representatives from some villages to collect such data from the wells near select villages to assist with the following:

1) Analyze data collected over the last few years to understand patterns in how the groundwater has changed in wells across villages over time and relate these trends to parameters such as rainfall.
2) Analyze the data from adjacent wells to decide how many unique wells must be measured to get a sense of water level in the ground.
3) Analyze the time patterns of the well data to understand how often well data should be collected to get a sense of an aquifer's behavior.

7.8 Outcomes

Any project associated with SDG involves compiling data accurately and consistently at scale.

7.9 Planning for the Next 12 Months

The COVID-19 pandemic has brought forth unique challenges in terms of how we work, interact, and live our daily lives. SIGDSA has begun working towards adapting its future activities and events with respect to the United Nation's goal of good health and wellbeing so that it can still leverage various benefits derived from a traditional face-to-face conference if the conference changes to a virtual delivery format in the forthcoming years. SIGDSA has also begun exploring avenues to organize its next meeting virtually as a contingency action plan while working to support the ICIS's organizing framework and AIS guidelines. Such a virtual meeting will provide virtual networking opportunities but will also need to consider differences in time zones to accommodate an international audience.

Furthermore, SIGDSA currently encourages its members to conduct research on globally relevant problems and emerging new areas (e.g., how pandemics spread, COVID-19 misinformation, climate and water management, etc.). Specifically, SIGDSA encourages COVID-19-related research on clinical and non-clinical aspects. Clinical aspects will require researchers to develop a large repository of COVID-19 patient data that connects to their lab work, diagnostics, demographic data, and electronic medical records. Such a repository will allow the SIGDSA research community to develop analytics models that

could help explain problems such as predicting days to ventilators, identifying optimal care paths, predicting mortality rates, understanding interaction among multiple diseases.

Research focused on non-clinical data includes research that examines how misinformation related to COVID-19 spreads through social media outlets such as Twitter and fake news websites or that investigates how satire news deviate from misinformation and real COVID-19 news. Researchers could repurpose and retrain existing models to detect fake news such as the one that Zhang, Gupta, Kauten, Deokar, and Qin (2019) propose to detect fake news in the COVID-19 context using a new corpus. Another example relates to groundwater management problems in developing nations such as India that deal with major groundwater shortage across various seasons. Water tables continue to decrease, which leads to deeper water wells and toxicity issues as well. Developing any recommended plans for improving groundwater management requires one to understand historical and current water levels, rainfall, and so on. To do so, one needs to collect and analyze data from millions of wells located in thousands of villages—a monumental task. SIGDSA will assist the University of Western Sydney with this analysis. Project results will not only help explain the aquifer status in the areas where data has been collected but also lead to best practices for scaling the project throughout India and in other countries. The World Bank has an interest in scaling this effort in many other places inside and outside India. For expressions of interest in collaboration, please contact the project's authors or the SIGDSA leadership team.

8 Women and Sustainability: AIS Women's Network College[8]

8.1 About AIS Women's Network (AISWN) College

The AISWN College promotes a network for supporting women scholars in information systems and enables mentorship relationships that will help women succeed in the IS discipline. As of December, 2019, the college had more than 228 active members, which included 35 doctoral students from 30 countries on six continents.

8.2 Women and Sustainable Development

One cannot ignore gender when discussing sustainable development. Climate change disproportionally affects women, which warrants urgent attention to address. As forces for change, women advocate for greater environmental responsibility in firms (Kassinis, Panayiotou, Dimou, & Katsifaraki, 2016; Post, Rahman, & Rubow, 2011), female CEOs play a strategic role in improving sustainability performance of firms (Birindelli, Iannuzzi, & Savioli, 2019), and more women in leadership roles increases the adoption of (Galbreath, 2019). Thus, helping women ascend to higher levels of responsibility will have positive impacts on sustainability.

8.3 Objectives

The AISWN College acknowledges that addressing the SDGs represents a critical global challenge. Worldwide, women continue to face challenges and barriers in gaining access to basic resources (food, water, healthcare, education, etc.) and attaining leadership positions in business and political organizations. The AISWN College believes that we cannot fully achieve sustainability without gender equality. AISWN College continues to work toward this objective.

8.4 Scope and Stakeholders

The AISWN College welcomes all members from the AIS community (regardless of gender) who support its mission to advance women's success in the IS discipline. While some members conduct research directly related to women in IS, the majority actively participate in other AIS SIGs, colleges, and chapters based on their professional, research, and personal interests.

8.5 Major Challenges

Unlike SIGs, the AISWN College does not primarily focus on a particular research area. Our members vary widely in their research interests and practice areas. Thus, a main challenge with respect to

[8] Jacqueline Corbett wrote this section.

environmental sustainability concerns identifying topics and activities that members will find interest in and that also support the college's mission. Other challenges include:

- A lack of funding for the college's activities
- Developing stronger links with SIGs
- Lack of technical infrastructure to support dispersed, asynchronous brainstorming, collaboration and sharing of resources outside of AIS conference networking events.

8.6 Potential Collaboration Opportunities Inside and Outside AIS

The diversity in the college's members means that they have significant scope for collaborating and integrating multiple perspectives. Some relevant grand challenges that members have identified include:

- Environmental sustainability (SDG 13, SDG 7, SDG 15)
- Healthcare IT (SDG 3)
- IS for healthy aging (SDG 3, SDG 8)
- IS to support migration (SDG 10)
- Promoting work-life balance (SDG 5)
- Social inclusion (SDG 10)
- Tackling online hate speech (SDG 3, SDG 10, SDG 16…)

At the 2019 ICIS in Munich, the AISWN College hosted a lunchtime panel discussion on "Research Opportunities in Grand Challenges". Moderated by Dawn Owens, co-chair of the AISWN College, the panel included Eleanor Loiacono from Worcester Polytechnic Institute, Hala Annabi from University of Washington, and Janet Toland from Victoria University of Wellington. The panel discussed issues related to diversity, equity and inclusion, personal authenticity, work-life balance, and hate speech as a form of violence against women and other vulnerable populations.

8.7 Outcomes: Measures, Methods, SDG Contributions, Impact

The AISWN College focuses first on achieving outcomes at the local level, which means changes in the AIS will serve as a barometer for progress. Some impact indicators include:

- Women in senior AIS decision-making roles
- Women nominated and receiving recognition from the AIS for their contributions to the community
- Number of participants in the AISWN Women's mentoring program
- Availability of family-friendly policies and services at AIS conferences
- Women in editorial positions (editors in chief, senior editors, associate editors) in major IS journals
- Women as first authors on published papers in major IS journals
- Stronger network links for women (especially junior and mid-career faculty) in research communities

Outside the AIS and the AISWN College, other impact measures include:

- Number of women in senior administrative positions in IS departments, business schools, and research centers
- Pay equity between male and female academics in IS
- Number of women doctoral students in IS and women entering the IT and IS disciplines in all capacities

8.8 Planning for Next 12 Months

In 2020-2021, the AISWN College plans to develop one new program related to the SDGs in line with its mission. The AISWN College also intends to sponsor a pre-ICIS workshop on women, IS, and grand challenges to support ongoing discussion, collaboration, and research on these important topics.

9 Summary

In this section, we summarize each SIG's plans (see Table 2) and the SDGs that each tackles. In analyzing these projects, at the 2019 AIS Sustainability Summit, the AIS SIGs and the College demonstrated that AIS members have already engaged with 16 of the 17 SDGs. Thus, they have yet to engage only with SDG 12 (responsible consumption and production).

Table 2. A Summary of Each SIG's Plans

AIS group	Initiative	Objectives	SDGs*	Activities	Outcomes
SIGGlobDev	Smart Village: Nepal Wireless Networking Project	ICT-based solutions for pressing developmental challenges	1, 3, 4, 7, 8, 10, 11, 13, 15, 17	Collaborative multi-faceted development to transform health, education, communications, income-generating opportunities, governance, and disaster management using ICTs.	Initial project in progress. Producing lessons and guidelines for future development projects.
Sustainability & Education Workgroup	Research on sustainability education programs in IS and sustainability curriculum development	The workgroup focuses on ensuring that all IS program graduates have the necessary basic knowledge and skills to deal with critical sustainability issues that we face today and will face tomorrow	4, 5, 8, 9, 13, 17	An international comparative research study into the current state of sustainability education engaging AIS researchers across three diverse countries: Canada, Ghana, and Iran. Further collaboration required to extend the project in 2020.	Study provided international insights into demand and requirements. IS + SDG courses less than 10% of SDG courses. Leadership and stronger links required. New studies for 2020 planned.
SIGGIS	Research, collaboration and educational outreach have a major focus for SIGGIS. About 25% of workshop papers have sustainability themes.	A forum for AIS members to discuss, develop ideas and promote research, stimulate curriculum and teaching in spatial information system, as applied to management of ICT & sustainability.	1, 8, 10, 16, 17	GIS can help address the "no poverty" SDG in association with the "peace, justice, and strong institutions" SDG by identifying the locations to target our efforts to end global poverty and child labor.	Collected and analyzed location data critical for sustainability, (e.g., links between poverty and child labor).
SIGDSA	A broad range of projects and stakeholders include weather, environmental, sustainability, water, resource management, healthcare, and infrastructure	Collaborative sustainability projects based on decision support and data analytics with positive impact on SDGs.	3, 6, 9, 13, 14, 15, 17	Pandemic spread (COVID-19) using clinical (electronic health records, lab, and diagnostics data analytics) and non-clinical data (e.g., COVID-19-related misinformation). Australian SRO-funded research study on groundwater management problems in India. Requires collecting and analyzing data on wells over several years.	Predictive models to understand how COVID-19 interacts with other diseases, misinformation detection, Projects will better explain the aquifer status and also develop best practices to scale project in India and other countries
AIS Women's Network College	The diversity of AISWN College in the college's members means that they have significant scope for collaborating and integrating multiple perspectives (see list of SDGs)	Addressing the SDGs represents critical global challenges. Worldwide, women continue to face these challenges and barriers.	1, 2, 3, 4, 5, 6, 8, 10, 15, 16, 17	AISWN College members have a broad range of interests with great scope for collaborative activities across SDGs	Contributions to achieving impact on selected SDGs identified.

*SDGs: 1) poverty, 2) zero hunger, 3) good health and wellbeing, 4) quality education, 5) gender equality, 6) clean water and sanitation, 7) affordable and clean energy, 8) decent work and economic growth, 9) industry innovation and infrastructure, 10) reduced inequalities, 11) sustainable cities and communities, 12) responsible consumption and production, 13) climate action, 14) life below water, 15) life on land, 16) peace, justice, and strong institutions, and 17) partnerships for the goals.

9.1 Challenges

The SIGs shared many challenges, such as the need for funding assistance in order to realize their aims. Half of the groups have engaged with other AIS groups internally or with external groups to financially support their projects.

9.2 Collaboration

Without exception, all the groups acknowledge the need to collaborate within AIS and externally with relevant organizations. They recognizes the global scale of sustainability challenges and the consequent imperative for the participating groups to scale their activities to achieve a meaningful impact. They also sought collaboration as a potential source of funding to help initiate projects in their preliminary stage and to sustain projects beyond their initial objectives.

9.3 Impact

The diversity of business sectors and the range of sustainability challenges combine to create an additional challenge for organizations that focus on addressing the SDGs. One cannot easily assess responses to specific sustainability challenges as performance metrics are frequently sector specific and each SDG has multiple facets. The SIGs have produced several impact-evaluation models and presented some examples of impact metrics at the 2019 Sustainability Summit. The AIS will need to determine how to adequately address this issue to determine its impact on the SDGs. Two factors serve as benchmarks for an adequate metric: 1) that it pertains to achieving and evaluating progress in addressing a SDG and 2) that one (preferably an independent party) can verify it.

10 Future Directions

10.1 Sustainable Conference

The AIS can take direct action by examining the actions that its sister societies take. For example, the *Communications of the ACM*, the Association for Computing Machinery's flagship journal, recently addressed sustainable conferences (Pierce, Hicks, Lopes, & Palsberg, 2020) and proposed that the ACM:

- Should publicly report how much CO_2 its conferences emit (particularly related to conference travel).
- Conference budgets should include a charge for carbon emissions to incentivize footprint reduction.

We find both actions commendable and recommend that the AIS pursue similar policies.

The AIS can also take other actions, such as:

- Making vegetarian the default choice for conference lunches.
- Eliminating all AIS conference handouts.
- Eliminating conference socials with a high carbon footprint.
- Reminding conference attendees to bring reusable beverage cups to a conference.
- Separating submission acceptance from submission presentation to limit the number of presentation, and, thus, the space and time the conference requires to papers that can attract a large audience and advance the discipline. The AIS should also offer these presentations electronically as the low-carbon conference option at a significantly reduced fee.

10.2 Community Building

To make an impact on sustainability teaching and research, we need to enlarge the community by engaging more SIGs and members. We should focus on building the capacity to receive and execute large grants by assembling resources to address the IS issues that the SDGs embody. Nearly every problem we face today requires significant information to solve as we see with the COVID-19 pandemic. Ideally, we could create cross-SIG teams to tackle each 17 SDG collectively to build a reputation for the AIS that will attract attention and funds.

Sustainability constitutes a global challenge, and we need to pragmatically focus on achieving impactful outcomes. To do so, the AIS might need to set up a separate team to evaluate each proposed project and establish key impact factors (KIFs) before a project commences and then evaluate achievement at several points during the project. Such an approach would build skills in project evaluation rather than leaving each project to assess its success. Furthermore, an independent assessment team has greater creditability.

Many large universities have a specialist assigned to identifying grant opportunities and assist researchers in applying for and administering successful grants. Thus, we do not need to build a capability in this area, but, when assembling a project team, researchers should ensure that their teams have someone who can tap into their university's grant specialist.

10.3 Sustained AIS Support

AIS members interested in sustainability have struggled for over a decade to encourage the AIS and its journals to recognize that sustainability constitutes the most important long-term problem that the world faces. We fortunately received the full and enthusiastic support of Alan Dennis, the current AIS president, for ICIS in 2019. Sustainability represents a long-lasting research theme and a global challenge that may take decades to address, and we should recognize it as such. Sustained leadership might mean creating an ongoing task force that includes appropriate AIS and SIG leaders to creating an enduring leadership team that reports directly to AIS council and reports on progress in teaching, research, advocacy, and more. We anticipate that many individuals who contributed to this report would become members of the proposed task force.

We have the resources in the community to make an impact, but we lack designated and dedicated leadership. We rely on informal leadership, such as the group that met to establish the first sustainability summit at lCIS. Grassroots leadership plants seeds, but shoots need continuing attention to flourish. The summit planted some seeds, but addressing global challenges requires the AIS to make longer-term commitments to create a field of fulfilled dreams.

10.4 Action Agenda

Several authors of this paper have participated in efforts to encourage IS research that produces solutions but achieved disappointing results (e.g., Gholami, Watson, Molla, Hasan, & Bjørn-Andersen, 2016). We need to deploy theory in terms of interventions that address sustainability. Scientists have established factors that cause global warming, and scientists and engineers have recognized for some time that we desperately need solutions that mitigate its effects (e.g., Pacala & Socolow, 2004). Our discipline has lagged behind others in solving the world's greatest problem and will remain so while it promotes theory over action to address sustainability. We have few examples about what we can do (e.g., Ketter, Peters, Collins, & Gupta, 2016), but they illustrate the potential for the IS discipline to make a difference.

Action requires three critical steps.

- Journals must recognize that sustainability requires shifting the focus from association-driven explanatory or theory research to intervention-oriented solutions as Pearl (2019) differentiates.
- IS scholars must recognize that global climate change represents such a serious problem that they should devote at least 10 percent of their research time to this area (a modest behavioural shift).
- The AIS must commit to further developing its initial sustainability agenda by advocating, implementing, and achieving activities collaboratively to address the SDGs with positive and verifiable impact.

We conclude with a quote from Antonio Guterres, Secretary-General of the United Nations:

> *I call for renewed ambition, mobilization, leadership and collective action, not just to beat COVID-19 but to recover better, together—winning the race against climate change, decisively tackling poverty and inequality, truly empowering all women and girls and creating more inclusive and equitable societies everywhere".* (UN SDGPR, 2020, p. 2)

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