DESRIST 2022

17TH INTERNATIONAL CONFERENCE ON DESIGN SCIENCE RESEARCH IN INFORMATION SYSTEMS AND TECHNOLOGY

Conference Theme - The Transdisciplinary Reach of Design Science Research

Today's world faces many complex challenges (i.e. wicked problems) that offer no easy solutions. Inter-related economic, environmental, social, political, and ethical drivers emphasize the need for a changing research landscape quite different from the disciplinary framing found in current institutional structures and processes. The sundering of disciplinary walls has been widely advocated but rarely achieved in the academic research communities. We seek a new frame of transdisciplinary research that transcends disciplinary, interdisciplinary, multidisciplinary, and cross disciplinary models to truly synthesize research disciplines in search of innovative solutions (Bernstein, 2015).

Descriptions of transdisciplinary (TD) research have been proposed but a definitive definition remains a work in progress (Russell et al. 2008; Jahn et al. 2012; Bernstein 2015). At the core there are three key characteristics that stand out in all working descriptions (Wickson et al. 2006):

- **Problem Focus –** TD research starts with a real-world wicked problem that impacts real people. This presents a major challenge to capture and represent the complexities of the problem space in order to support both relevant and rigorous solutions. A single discipline does not own the problem.
- **Emergent Research Methods –** The goals of TD call for the construction of novel research methods or the novel combination of disciplinary research methods as a process of emergence during investigation of the research problem. An iterative and incremental TD research process supports the selection and fusion of the most appropriate research methods as the research evolves.
- **Collaboration –** The richness of TD research requires active participation from the full variety of problem stakeholders: researchers, practitioners, clients, managers, and community members who are impacted by the designed solution. Knowledge, wisdom, and creativity are maximized via a collaborative process in pursuit of balanced and satisfactory solutions.

The appropriateness of Design Science Research (DSR) to serve as an epistemological and methodological foundation for transdisciplinary research can be seen by matching the concepts, methods, and processes of DSR and Action Design Research (ADR) to the key TD characteristics above. The unique mix of creative design to solve relevant problems and rigorous science to grow theory around the intervention and use of the novel solutions provide a compelling frame for transdisciplinary research projects (Shneiderman, 2018).

Thus, the theme of DESRIST 2022 challenges the DSR community of researchers from many diverse disciplines to engage in more relevant and rigorous transdisciplinary projects. The suggested research tracks listed below are meant to move beyond traditional disciplinary siloes. Research papers, panels, workshops, and prototypes will be encouraged to demonstrate the TD characteristics of problem focus, emergent research methods, and rich collaborations of stakeholders for the solution of complex and wicked problems. DSR makes a difference.

REFERENCES

Bernstein, J. (2015) Transdisciplinarity: A Review of Its Origins, Development, and Current Issues, *Journal of Research Practice* (11:1), Article R1, 20 pages.
Jahn, T., Bergmann, M., and Keil, F. (2012) Transdisciplinarity: Between Mainstreaming and Marginalization, *Ecological Economics* (79), pp. 1-10.
Russell, A.W., Wickson, F., and Carew, A. (2008) Transdisciplinarity: Context, Contradictions, and Capacity, *Futures* (40), pp. 460-472.
Shneiderman, B. (2018) *The New ABCs of Research: Achieving Breakthrough Collaborations*, Oxford University Press.
Wickson, F., Carew, A., and Russell, A.W. (2006) Transdisciplinary Research: Characteristics, Quandaries, and Quality, *Futures* (38), pp. 1046-1059.

Industry Workshop - The Transdisciplinary Reach of Design Science Research

Overview

Since Design Science Research is inherently a problem-solving process, we want to use the workshop to explore a specific problem faced by an organization. The fundamental principle is that knowledge and understanding of a design problem and its solution are acquired in the building, evaluation and application of an "artifact" – typically an innovative product, service, model, process, or system. DSR implements artifacts within an application context (e.g., a business organization) for the purpose of improving the effectiveness and efficiency of that context. The utility of the artifact and the characteristics of the application -- its work systems, its people, and its development and implementation methodologies -- together determine the extent to which that purpose is achieved. Researchers in business produce new ideas to improve the ability of humans, groups, and organizations to adapt and succeed in the presence of changing environments. Such new ideas are then communicated as knowledge to the relevant stakeholders and communities. March and Smith (1995) identify two design processes and four design artifacts produced by DSR. The two processes are build and evaluate. The artifacts are constructs, models, methods, and instantiations. Sein et al. (2011) describe the use of action (intervention) research methods (ADR) to build and evaluate various types of artifacts. Mullarkey and Hevner (2019) elaborate (eADR) on four stages in the design action research approach progressing from Diagnosis to Design, Implementation and Evolution. (see diagrams)

References:
Salvatore T. March & Gerald F. Smith (1995) Design and natural science research on information technology, *Decision Support Systems*, 15:4, 251-266.

Matthew T. Mullarkey & Alan R. Hevner (2019) An elaborated action design research process model, *European Journal of Information Systems*, 28:1, 6-20.
Sein, M., Henfridsson, O., Purao, S., Rossi, M., & Lindgren, R. (2011) Action design research. *MIS Quarterly*, 35:1, 37–56.

For the workshop, we will explore four vignettes that outline a specific socio-technical challenge facing an organization's decision makers. Each will outline the specific tough decision facing the organization, the problem domain, the anticipated solution domain, the nature of the artifact to be designed, the general and specific context, the technology and how technology is disrupting the space, and, the insider insights on what makes this a challenging problem worthy of a dedicated design effort.

Tough Decision: <<one to two sentences that describe the tough decision facing the protagonist and what makes the decision "sticky" and "wicked" (persistent and not easily solved).>>

Problem Domain:<<all the information that defines the problem and constrains any potential solution(s); the areas of expertise and application that need to be examined; stick to relevant topics solely within the delimited area of interest; if existing, "failed" solutions exist they can be discussed here to understand the "pain(s)" or "gains" they do not solve; understanding the problem domain is often the most difficult part of the design process.>>

Solution Domain:<<describe the environment in which the solution will need to operate; describe the processes for its possible construction, testing, operation; define desired outcomes (for the organization and for the customer(s)); identify critical stakeholders and their potential involvement in the evaluation of the solution; consider a RACI diagram to categorize stakeholders.>>

Nature of the Anticipated Artifact:<<describe the anticipated level of abstraction of the artifact for this activity – will it be a theory, policy, model, product, service, process or system; explain why this level of abstraction is desirable; describe the evaluation process and how the utility will be measured/considered.>>

General Context:<<describe the industrial, geographical, virtual and technological environment surrounding the organization seeking to design the artifact; include descriptions of competitors, collaborators, and partners; describe resource availability and constraints.>>

Specific Context:<<describe how the organization/team creates value in this environment; what is its key competitive advantage; what are its core competencies; describe the ethical considerations for the artifact and its design.>>

Technology/Disruptors:<<describe how technology is disrupting the problem or solution domain or both>>

Insider Insights:<<describe what makes this a sticky, wicked problem for the organization right now; describe why it is particularly important to solve the problem right now for the organization and its key stakeholders.>>

Goal of the workshop exercise is to (1) explore multiple plausible artifacts and (2) describe the means to evaluate each if explored further through a rigorous, iterative elaborated action design research activity. We encourage the teams to consider which stage is the point of entry for this research exercise. Then, consider using the iterative eADR cycle to explore artifacts at any given level of abstraction.

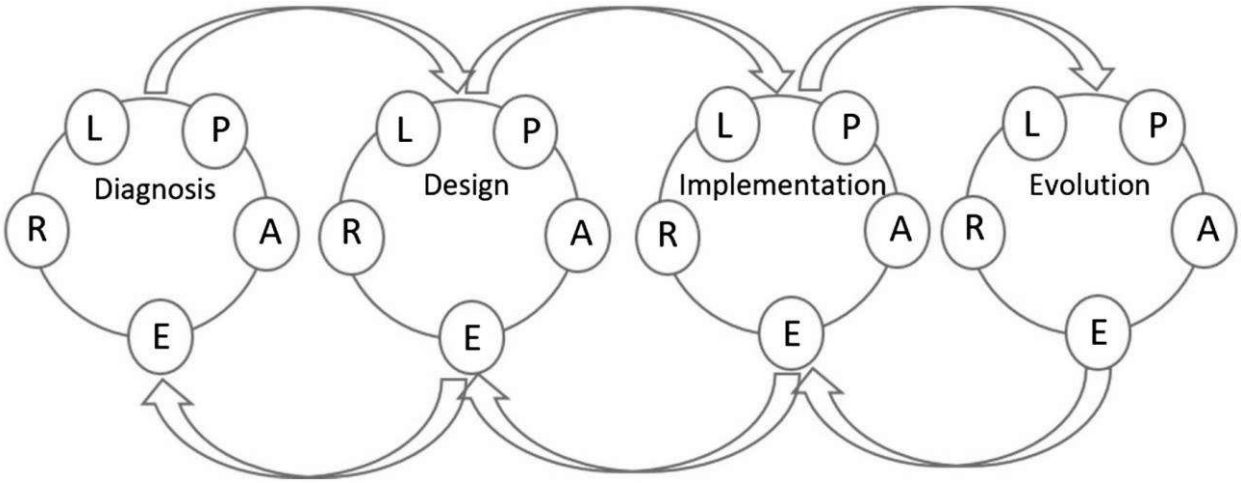

Figure 1: The four stages of eADR. [P – problem formulation/planning; A – artifact abstraction; E – artifact evaluation; R – reflection; L – learning]

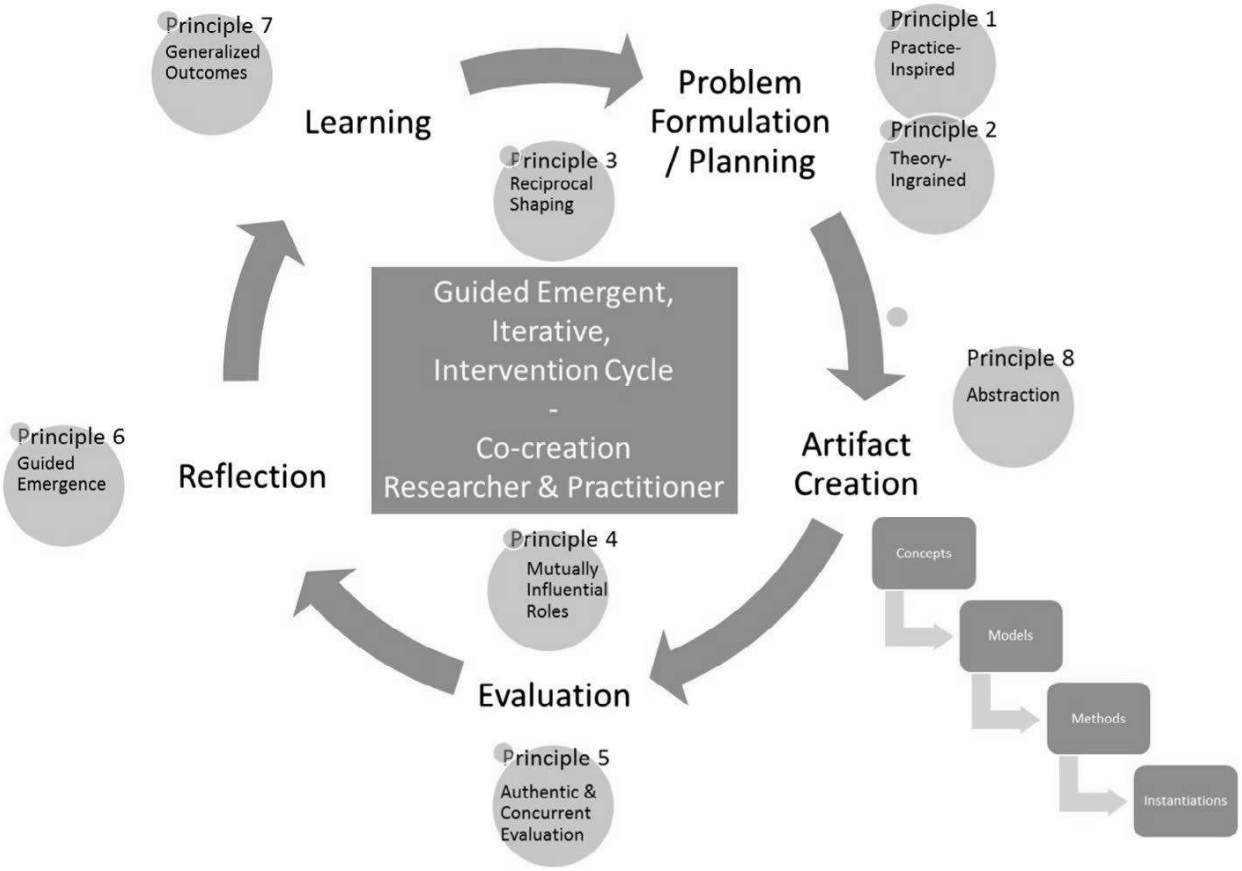

Figure 2: The elaborated action design research (eADR) cycle. [Including eight principles of intervention engagement at various points in the cycle.]

See Appendix A.

Appendix A – Elaborated Action Design Research (eADR) Methods

The synergies of combining design science research methods with action research methods support relevant and rigorous researcher-practitioner engagements to build and evaluate solutions for wicked real-world opportunities and problems. As summarized in this appendix, the constructs and methods of action design research (ADR) were initially presented in Sein et al. (2011) and elaborated upon later by Mullarkey and Hevner (2019).

The elaborated ADR (eADR) process model supports four distinct cycles for the diagnosis, design, implementation, and evolution of a growing artifact-based solution. Each cycle moves through activities of problem formulation, artifact creation, evaluation, reflection, and learning. Rapid iterations of eADR cycles provide a well-defined process map for managing and performing an emergent project. The proposed model supports multiple entry points based on the current state of the problem environment and the goals of the project. The eADR process model provides a flexible yet disciplined inquiry into the initiation, conduct, reflection, and presentation of rigorous and relevant information system solutions.

Figure 1 elaborates the activities and principles inherent in any eADR cycle. A project will normally move through multiple cycles that iterate among cycles of diagnosis, design, implementation, and evolution. Each project cycle supports the full range of activities from problem formulation and planning to artifact creation, evaluation, reflection, and formalization of learning. The key insight here is the different nature of the artifacts produced within each cycle and what is communicated to researchers and practitioners at the completion of that cycle.

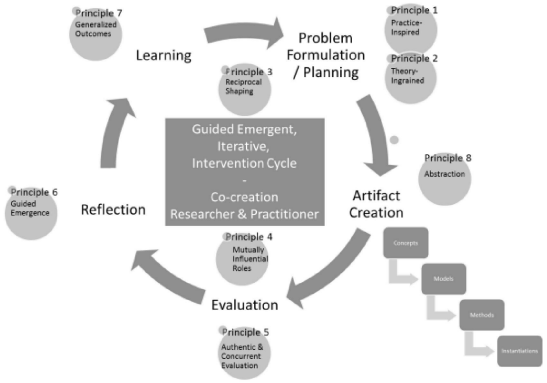

Fig. A.1. The eADR Cycle

The figure illustrates the key ADR concepts (intervention, guided emergence, co-creation) at the center of the cycle as fundamental to the conduct of each activity on the cycle. We also expect every cycle to go through a Problem Formulation, Artifact Creation, Evaluation, Reflection, and Learning sequence of activities. All cycles incorporate the key activities and principles described by Sein et al. (2011) with the key addition of the Artifact Creation activity as a generalization of the build activity. We posit that the eADR cycle as elaborated can be used as a generic template for all the different types of cycles in the overall eADR process model as shown in Figure 2.

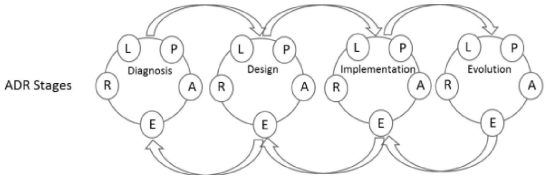

Fig. A.2. eADR Process Model

The researcher-practitioner intervention can begin with a thorough investigation and diagnosis of the problem domain and an evaluation of IT solution classes. The goals of the *Diagnosis* cycle are to analyze the importance of the problem domain and the relevance of the IT solution class to research and practice with mutual agreement among the researcher-practitioner team. This involves identifying the relevant kernel design theories, any existing technical artifacts, and the goals of the project. There are two critical areas of knowledge transfer during diagnosis. The researcher must understand the application domain of the project to include specific knowledge of the practitioner's organization with its strengths, weaknesses, opportunities, and constraints. At the same time, the practitioner must become aware of the existing knowledge base of research and practice in the fields of study that will inform the design and evolution of the diagnosis artifact.

The *Design* cycle focuses on the identification and conceptualization of the proposed solution artifact design. It provides a set of activities over the search space of possible design candidates. Through one or more iterative eADR design cycles, design principles emerge that address the problem class identified via diagnosis and derive an IT solution. Here collaborative intervention with co-creation activities ~~are~~is essential as the researcher-practitioner team create designs that incorporate innovative ideas to solve the given problem. Human cognitive and social skills are applied to make clear contributions to both the problem environment and the knowledge base of the field. The *Abstraction* principle dictates that the abstraction level of the artifact (~~e.g.~~e.g., construct, model, method, or instantiation) be determined by the needs of the research project at that point in time. Design cycles

may be iterated as the problem solution evolves over time in the research project.

The *Implementation* cycle instantiates the artifact design in context at the client organization. A real-life intervention provides the opportunity to perform on-site evaluations of the efficiency and effectiveness of the proposed design as realized in situ. Typical artifacts abstracted and evaluated in the *Implementation* cycle include systems, algorithms, programs, databases, and processes.

Finally, *Evolution* cycles occur over time as the problem environment changes and the artifact solution evolves to meet these changes. We note that the evolutionary processes of problem re-formulation, technology advancements, design improvements, and continual interventions may be a long-term organizational project and will continue to generate knowledge useful to researcher and practitioner. We find that there is a need to re-consider instantiated artifacts at some point after implementation and during or after adoption as to they evolve over time.

REFERENCES

Mullarkey, M. T. & Hevner, A. R., 2019. An elaborated action design research process model. *European Journal of Information Systems,* 28(1), pp. 6-20.

Sein, M. et al., 2011. Action design research. *MIS Quarterly,* 35(1), pp. 37-56.

Immersive AI/ML Enhanced Cybersecurity Human-Technology Training

The ongoing technical training of roles dealing with cybersecurity, technology, development and others is becoming increasingly difficult to do based on how fast innovation is happening in the market. Another factor especially surrounding cybercrime and fraud is that the bad actors are evolving quicker than training can be rolled out corporations to fix or defend their products.

Problem Domain:
Training IT, cybersecurity and development staff at scale and quickly is a problem for many of these reasons:

- Many existing training programs are outdated and take too long to roll out new updates.
- Training programs are very rarely tuned to a specific company or role at a company and generically cover the "lowest common denominator" topics
- Technical training programs typically do not adapt to the user's existing skill levels or rate of learning, leading to the learner to either get bored or overwhelmed.

Solution Domain:
The solution must be able to take into account beginner through senior expertise levels and ability to adapt to new research discovered, acquired skills from the learner and methodologies discovered in the field in close to real-time. The solution should also be available to in a variety of different and accessible trained methods given the nature of remote workforce and learning styles prevalent now.

Nature of Anticipated Artifact:
The anticipated artifact should be an evolution of current training materials and programs. The solution should include elements of hands-on learning as well as prepared coursework to provide a realistic training scenario that actively tests adaptive problem solving skills, giving them to ability to apply and adapt to the topics changes to topics being taught in near real-time.

General Context:
This training issue applies to all technical training currently being given, but specifically for cybersecurity training for analysts, developers or IT staff. This solution should be available 24/7 and from any device given the diverse nature of the learners as well as taking advantage of advanced concepts such ML/AI to learn and adapt with the learner in training realistic to their role.

Specific Context:

Training technical staff on cybersecurity quickly is essential for many products or companies to survive and thrive in today's market.

Technology/Disruptors:
Virtual hands-on lab environments or simulators are vastly improving and augmenting the capabilities of training programs, but unfortunately still lack the flexibility and customization needed by specific job roles or industry verticals. Pairing this existing technology with machine learning or AI concepts to truly provide the learner with a realistic, immersive and customizable program based on their learning style, progression speed and relevance would be a game changer for these learners.

Insider Insights:
Many organizations cannot effectively train the staff they have, let alone attract new people to the field or incentivize new hires with the current training programs in place. There isn't a massive cybersecurity shortage due to lack of people as portrayed in the media, the problem is rather a lack of individuals that would love to be in the field of cybersecurity, but lack the necessary or effective training to get started or progress in their career to more senior roles.

Industry Executive: Joe Partlow, CTO, Reliaquest
Facilitator: Alan Henver, Ph.D.

Intelligent Systems Design – Matching People to Opportunities

Hiring qualified job candidates is an ongoing challenge for most employers and especially for staffing companies that hire and onboard employees at scale on behalf of their clients. The problem is compounded with skills areas in high demand such as Information Technology (IT). The search and match technology used to match job candidates to job openings has improved in the past decade but lags in quality and speed of match that staffing firms require. Advances in machine learning and artificial intelligence show promise, however concerns over candidate selection bias complicates the use of these tools. The challenge for staffing firms is to create new solutions for finding and qualifying job candidates faster than their competitors.

Problem Domain:

Finding and hiring IT professionals at scale, which means finding and evaluating potentially hundreds of candidates per week is a challenge in normal times and has been compounded in recent years. Fueled by organizations engaged in digital transformation initiatives and the need to implement secure solutions to support remote employees due to COVID, demand for IT professionals is at the highest level seen since the dot com era.

A fundamental challenge matching job candidates to job openings is the use of screening technology that identifies keywords in the candidate's resume that match keywords in the job. Screening technology has improved considerably but are unable to overcome inconsistencies in the quality and styles of how resumes and job descriptions are written.

The presence of keywords (which are typically skills) listed on a resume is not a definitive indicator the candidate is proficient in the skill. Also, the mere presence of a resume found in a job board that includes keyword matches does not mean that a job candidate is interested in a new job or in the company the staffing firm is hiring for. Finally, once a qualified candidate is located, odds are those with high demand skills will have multiple offers to consider, making it imperative to close the candidate as quickly as possible with an offer that will keep them on the job for the duration of the assignment.

Solution Domain:

New solutions are required that more quickly and accurately identify qualified job candidates from multiple sources that include external job boards and internal databases. The solution must be capable of determining if the candidate is interested in a specific job opening, available for employment and has the skills required to perform the job.. New solutions must take into consideration elements other than resumes and job description text to identify job candidates, such as comparing potential candidates to previous successful candidate profiles, skills assessment, etc.

Nature of the Anticipated Artifact:

The anticipated artifact will be an IT solution that improves upon existing solutions. It must take into consideration several attributes related to the candidate and job opening to make matches faster and more accurate. It is anticipated that several new artifacts will be required that include software solutions and models that describe how the new solution would function. Potential artifacts may also include models that define ideal candidates and new and improved software solutions in the search and match space.

General Context:

The problem domain described exists in the global staffing industry at large. We seek a solution specific to the U.S. staffing industry and that is specialized primarily to IT talent.

The technical environment in which the new solution will function is modern and consists primarily of SaaS and cloud applications. The environment includes an industry leading search and match platform that has been integrated into a modern talent management solution. The current solution is performing well, however the need exists to constantly innovate given the hyper-competitive nature of the staffing industry. TextKernel, which supplies search and match technology for the staffing industry, and Microsoft are providing resources to support developing new AI/ML enabled solutions. USF and MIT are also supporting the project by determining what patterns exist between job candidates that have been previously placed successfully. MIT is specifically focused on the bias aspect of using machine learning by seeking opportunities to locate underrepresented candidates.

Specific Context:

Finding and placing capable job candidates quickly, at scale is imperative to the success of staffing firms. The organization able to find and place candidates fastest, at a cost acceptable to the client and a pay rate acceptable to the job candidate wins. To remain competitive, staffing firms must continue to innovate in this space. For the firm that wishes to implement a new solution, innovation must result in a solution that maximizes the benefits for the staffing firm, its clients and potential job candidates.

Technology/Disruptors

Numerous technology solutions have been introduced to the market, however, to date none of the solutions solve the complete process of finding and qualifying job applicants. Some solutions act as aggregators that allow hiring companies to easily tap into a broader market and some improve upon the text based nature of the match process. Rather than attempt to evaluate and potentially integrate numerous solutions, we seek a single end to end solution that can be easily integrated with existing technology.

Industry Executive: Denis Edwards

Facilitator: Robert Winters, Ph.D.

Data Fabric in Smart City Design

There is a plethora of technology tools being used by cities to solve community challenges. These tools range from environmental sensors that collect data on air quality to cameras that can evaluate the safety of an intersection for pedestrians and bicyclists. The data collected and resulting analysis is shared with the community, but it is often weeks or months after collection. Ideally this data would be available at or near real-time. The challenge is how to get it to the broader community in a way that is understandable and includes as much contextual information as possible (e.g., trends, key definitions). Further compounding this issue are false data caused by programming issues and privacy concerns. The challenge for cities is to find a way to navigate these issues to build trust with the community, fully leverage the capabilities of these technology tools, and realize the expected benefits.

Problem Domain:

Smart city technology has gained momentum in the last few years. These technology tools vary widely but have a common purpose of solving challenges that are experienced by a broad community rather than an individual. The deployment of these is often led by municipal governments, universities, or nonprofit organizations.

The data that results from these projects should be shared with the community that has the challenge. The community members can then validate the data, provide their insights in the analysis, and co-create potential solutions. However, there are several complicating factors make the data sharing difficult.

Community oriented sharing – The dashboards that accompany smart city technology tools are often created for technology-oriented audiences. They are real-time but require a deep understanding of the subject matter to navigate. Identifying a simplified format for community members and ingesting the data into that format quickly are necessary for effective sharing. Determining what data to not include is just as important as determining what to include.

False data - As sophisticated as these technology tools are, they are also still in infancy. Many are being piloted in "real-world" situations to fine-tune their programming. As a result, the data that results can be incorrect until the software and hardware is "trained" on what to look for and how to interpret the data it collects. For example – cameras and software that track what is happening in an intersection originally misread buses that had advertising with faces on it. Critical to this will be figuring out how data to share data during this evolution in a way that the community feels comfortable as adjustments are made.

Privacy concerns – As data is collected, it is possible that some data (or more likely a combination of data) will reveal information that is sensitive. In addition, many communities like the State of Florida have laws that require information held by the government to be available to any citizen by request. Data collected in smart cities technology could be subject to these laws, and when the data is shared it could reveal something that the community would prefer is kept private.

Solution Domain:

The solution must be able to operate in the broad community – across different stakeholder groups – and ideally in a format that does not make it difficult to reach and/or engage with. Groups

involved may include local government leaders, community organizations, neighborhoods, business districts and the university (e.g., students, faculty, and staff). Testing of the solution can involve one or more of these groups. The solution must be scalable. As new data is generated from projects and new stakeholders are identified who would like to participate.

Nature of the Anticipated Artifact:

The anticipated artifact will be a process and tool for data sharing. The process must be able to determine what data to share, how to share it, and when to share. The process should consider policies for that respect privacy and abide by local, state, and federal laws, and the tool incorporate procedures for ingesting the data rapidly. Innovative solutions would also include a consistent approach to the selection of data to exclude, and ways to illustrate the benefits to the community provided by the technology.

General Context:

The problem domain described exists in many communities. St. Petersburg is part of a network of 35+ municipalities that are grappling with similar situations. Each area may have different laws and historical relationships to contend with, but the overall issues are the same. Resources are frequently limited in these settings so solutions that are low or moderate cost are ideal.

Specific Context:

In St. Petersburg, the smart cities technology projects are led by a nonprofit – the St. Petersburg Innovation District – in partnership with the City of St. Petersburg and the University of South Florida. The intent of the local smart cities projects is to demonstrate that technology can improve the St. Petersburg community. They also provide a series of tests in preparation for significant urban development projects in and around the Innovation District where the technology may be implemented at a larger scale.

Technology/Disruptors

Numerous dashboards and reports are provided with the smart city technology. Policies and laws exist regarding data collection and privacy. At the same time, individual communities are tackling the information sharing challenges in silos. We seek to find a solution that is community oriented, and scalable. We would also like to be able to share this with other communities removing the need for them to individually evaluate options and create something new.

Industry Executive: Alison Bartlow

Facilitator: Jan vom Brocke, Ph.D.

Complex Adaptive Systems Design - Unregulated/Illegal Global Markets

Illegal, Unreported, and Unregulated Fishing (IUUF) constitutes a threat to sustainable fisheries across the planet, and the trends will continue to worsen unless systemic-level interventions are taken. Although many seafaring countries contribute to this problem, the single largest and most aggressive country participating to IUUF is the Peoples Republic of China (PRC). As incomes across the planet increase, the demand for higher quality fish also increases further straining global fish stocks. Inadequate enforcement capacity, bilateral political and economic pressure, and corruption inevitably contribute to the stress on vital fish stocks. Disruptions to artisanal fishing communities across the Global South have increased greatly over the past decade, and the trends are anticipated to worsen.

Problem Domain:

IUUF falls into both the categories of legally delimited, sovereign territory and the Global Commons, for which voluntary cooperation among states is necessary for meaningful governance. Illegal fishing, by definition, involves maritime boundaries over which states are granted exclusive economic rights, called Exclusive Economic Zones (EEZs). States create and enforce laws and regulate the catches under their jurisdiction. Unreported and unregulated fishing generally occur in the Global Commons (e.g., the high seas) or just outside of EEZs. Attempts to manage fish stocks in the Global Commons, such as through Regional Fisheries Management Organizations (RFMOs), require the cooperation of states to hold their fishing companies and boat captains accountable for violations. That is, states must voluntarily cooperate for governance to occur.

Although the impact on fish stocks presents a dire situation, other pressing issues also emanate from IUUF. First, IUUF establishes an illicit market within the larger fishing supply chain. As such, it creates pathways for other illegal and illicit activity by perpetrators. Second, it often relies heavily on labor rights abuses and human trafficking to maintain price points. Third, IUUF tends to undercut the competitiveness of fishing companies in the developed world that follow national and international production standards. Fourth, it is resistant to market regulation because regulation raises the cost of production and increases the incentive for marginal producers to engage in the activity. And fifth, IUUF by one major country against another, smaller country can cause a cascade effect whereby impacted fisherman of the smaller state then seek out catches in other states' EEZs.

Solution Domain:

Due to the wide range of challenges stemming from IUUF, interventions to mitigate it will likely require multiple solution domains. The policy domain naturally comes into play with respect to generating system drivers for each country, and mismatches in national policy could lead to ineffective responses globally. Next, the business domain can incorporate market incentives through the fishing, processing, distribution, finance, and insurance industries to combat the practice and sale of IUUF. The information domain plays an important part as both national and

corporate reputations and branding contribute to consumer choice. Similarly, the technology domain has a role since modern Radio Frequency Monitoring Systems (RFMS) technology offers potentially low cost, high traceability options for catches. The Human Rights domain presents another option as higher sensitivity to labor violations and human trafficking create significant costs in the current era. And finally, international organizations and regimescould promote greater awareness of and protection of the Global Commons through coordinated state action.

Nature of the Anticipated Artifact:

The anticipated artifact will most likely result in a platform, venue, or theater for evaluating proposed interventions across the various solution domains over a long period of time. Given the range of challenges, the complexity of the systemic interactions, and the political sensitivities and power differentials involved, IUUF will continue for years to come and require broad-based interventions that yield cumulative results over time.

General Context:

Fisheries cooperation through RFMOs has until recently worked relatively effectively. While IUUF existed, the scale was marginal as compared to the available fish stocks. Over the past fifteen years, the PRC's shift away from internal and regional sources of fish to aquaculture-based fish farming has resulted in heightened reliance of pelagic fish found in the waters across the Global South EEZs and in the Global Commons. The stress on global fish stocks will only increase in the coming years.

Specific Context:

With Chinese rivers and the South China Sea now substantially denuded of viable natural fish stocks, the PRC has been forced to search for high-end catches, such as tuna, and low-end pelagic fish, mainly for fishmeal in aquaculture, in other countries' EEZs and in the Global Commons. Diminishing the impact of the PRC's growing fleet of industrial-size trawlers on global fish stocks will be undertaken within the context of larger PRC efforts to combat perceived food insecurity and strategic competition.

Technology/Disruptors:

Technology has both positive and negative components with regard to IUUF. Chinese fishing trawlers have now reached massive size and provide internal processing capacity. On the other hand, RFMS technology presents some opportunity to validate supply chain reporting. Currently, the capture technology outpaces the implementation of tracking technology, systems, and collaboration.

Industry Executive: Isaiah (Ike) Wilson

Facilitatory: Matthew Mullarkey, Ph.D.