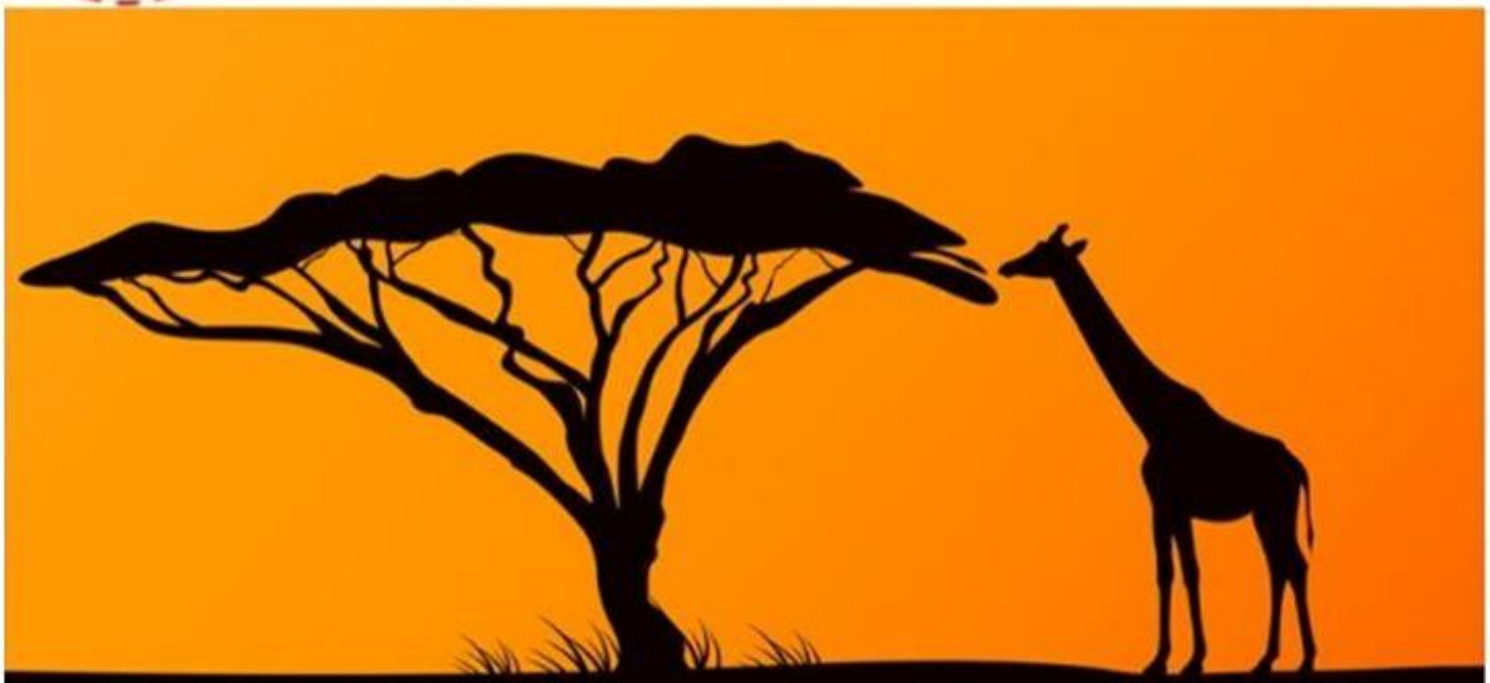
International Society for the Systems Sciences

https://www.isss.org/2023-kruger-national-park/



ISSS 2023 Kruger National Park, South Africa

Theme: Systems Practice for Professions

NWU

17-19 June: Writing retreat and informal meetings

19-23 June: Main Conference

17-23 June: Systems Thinking in Practice Workshop for PhD students and Professionals with Pre-Conference full-day sessions and dedicated sessions during the Main Conference

Conference Programme and Book of Abstracts

ISSS 2023

Theme: Systems Practice for Professions

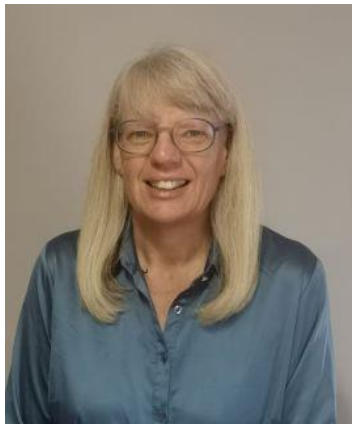
The ISSS is providing a unique annual meeting experience in June 2023. The main conference takes place from June 19 -23 in the Kruger National Park in South Africa. The conference will provide an opportunity for networking and scholarship for systems practitioners and academics in the midst of a complex social and natural ecosystem.

19-23 June: Main Conference

17-23 June: Systems Thinking in Practice Workshop for PhD students and Professional with pre-conference full-day sessions and dedicated sessions during the Main Conference

Welcome

Prof Roelien Goede (President 2022-2023)

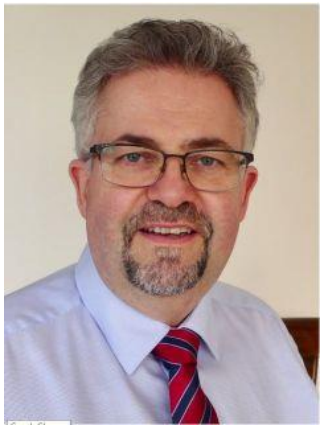


We invite you to come to the Kruger Park to be part of an experience of a lifetime. Experience the situatedness of the venue under the African skies. The conference venue enables many Africans to attend, thereby widening the footprint of our society and affording us to learn from each other.

Stories of our systems practice will showcase the impact we have as systems practitioners. We also reflect on our discipline as a profession. Our workshops provide a diversity of experience and future planning of the ISSS.

The weeklong Systems Thinking in Practice Workshop provides a unique opportunity to develop your skills. Another unique experience is our research project on reflection during our conference.

Dr Olaf Brugman (Vice-President Conferences)



Science-based knowledge of systems is one of the keys to robust application in various professions. I am excited that ISSS will bring experts in systems knowledge and systems practice together to inspire each other and to make each other better. Also, ISSS is fulfilling its promise to build a bridge to African scholars and practitioners and extend our mutual networks. Let us act together in a way that provides us with more knowledge and options for action than we had before.

Invitation to our ISSS Daily Morning RoundTable

(June 20-23, Tuesday-Friday)

EVERYONE IS INVITED to our twenty-third annual ISSS Reflection RoundTable

Every morning from 7:00 to 7:45, June 20-23, we will meet before breakfast and the plenaries. Join us every day, or whenever you like! You can bring your water, tea or coffee (Food is not allowed in our meeting room.)

Our RoundTable purposes are to open a space for daily reflection on our ideals, what we want to learn and create; to increase time for each of us to talk about what we are thinking and learning now; and to be listened to by others, enjoying and learning with each other in a new way.

Our format is: We spend 5 minutes listening to RoundTable Guidelines and suggested topics. We then spend 40 minutes on individual reflections or learning reports, time distributed equally among all present (e.g. 20 people = about 2 minutes each. We use a timer to keep on schedule).

Our suggested topic for the first morning might include: “What situations and projects did you leave behind to come here, and what could happen here that would be valuable to you in your work and life back home?” or your thoughts about our conference theme “Systems Practice for Professions.” Following days, “What did you experience or learn yesterday (this month/year) that was important for you? In what way was it important?”

Each day, a main topic will be suggested by a different volunteering facilitator.

Folk wisdom and compelling research indicate that participants experience surprising benefits from this activity after about four sessions. Our own experience with this format has resulted in the following theory: Just as we break the sound barrier when we travel faster than the speed of sound, we break the communication barrier when we hear 30 authentic viewpoints in 60 minutes. Please contact Janet or Sue with any questions.

Looking forward to experiencing this with you all!

Conference Programme

SIG sessions are numbered for example, S1 means SIG Session 1 which occurs on Tuesday at 12:00. Different tracks in this session are labeled 1A, 1B, etc.

Workshops and semi-plenary sessions are similarly labelled, for example SP1 means semi-plenary session 1 which occurs on Tuesday at 11:30. Tracks in this session are labelled SP 1A, SP 1B, etc.

Workshops are introduced on Monday at 19:30-20:30 and Tuesday 15:00-15:30. The workshops are self-organised during the evenings and start formally on Wednesday at 19:30.

The programme is followed by an alphabetical list of speakers, paper titles, and session numbers.

The conference programme is also available in A4 format at the registration desk and electronically on the conference website.

Any changes to the programme will be communicated on the Signal groups. Please join them if you have not done so yet.

Activity	Time	Monday, June 19th				
		Track 1 Ndlopfu (elephant)	Track 2 Ingwe (leopard)	Track 3 Ndou (elephant)	Track 4 Mhelembe (rhino)	Track 5 Nari (buffalo)
Conference Opening	12:15-12:45	Dr Olaf Brugman Prof Roelien Goede				
Welcome from NWU	12:45-13:00	On Behalf of Deputy Vice Chancellor: Research, Dr Hennie Goede				
Lunch	13:00-14:00	Conference Buffet				
President's Address: Roelien Goede	14:00-14:30	Systems Practice for Professions				
Keynote: Ray Ison	14:30-15:30	Professionalising the Systems Thinking Practitioner				
Tea break	15:30-16:00					
Keynote: Sammy Njenga	16:00-17:00	An African perspective on leadership and future leaders				
Research Project: Stephany Peterson	17:30-18:00	Reflective Conferencing				
Dinner & dinner activity	18:00-19:30	Cocktails & choir				
Wokshop Introductions	19:30-20:30	W Smith / Lauoris / Gardiner / Argall / Potts / Scholte				

Activity	Time	Tuesday, June 20th				
		Track 1 Ndlopfu (elephant)	Track 2 Ingwe (leopard)	Track 3 Ndou (elephant)	Track 4 Mhelembe (rhino)	Track 5 Nari (buffalo)
Breakfast	07:00-08:45					
RoundTable before breakfast	07:00-07:45	EVERYONE IS INVITED to our daily equal-turn Reflection RoundTable				
STiP Activity during breakfast	07:30-09:00	Groups meet for CLS reflection session 1 (facilitator only 'at hand', essentially the groups should be self-organising and working on their Systemic Inquiry (= Assignment 1)				
Keynote: Rachel Lilley & Gerald Midgley	09:00-10:00	Rethinking Systems Thinking: Towards an Anticipatory Systems Perspective				
Tea break	10:00-10:30					
Keynote: Suja Joseph-Malherbe	10:30-11:30	The leadership imperative and cultivating it				
Semi-plenary (SP) Session 1	11:30-12:00	SP 1A: Raghav Rajagopalan: Systemic consciousness: New horizon for systems practice		SP 1B: Eve Pinsker: Systems Thinking, Systemic Change and Equity in Public Health Practice: A Dialogue		
SIG Sessions 1	12:00-13:00	1A: CSTP 20 Peterson, S 20 Manduna, W (1) 20 Cloete, D	1B: RTGS/HS 30 Dostal, E (2) (RTGS) 30 Cook, P (HS)	1C: DES/SESD 20 Malele, V (DES) 20 Gabriele, S (DES) 20 Clifford-Holmes, J (2) (SESD)	1D: OTSC 20 Cottam, R 20 Williams, B 20 O'Donnell, J (1)	1E: SMSE 20 Roberts, R 30 Love, T (1)
Lunch	13:00-14:00	Conference Buffet				
Keynote : Gary Smith	14:00-15:00	Towards a Unifying Framework for Systems Science				
Semi-plenary (SP) Session 2	15:00-15:30	SP 2A Yiannis Laouris: Towards improving the visibility, impact, and societal contributions of ISSS	SP 2B: Nick Argall: Organization Engineering in practice: Designing a paradigm for Systems Science	SP 2C: Louie Gardiner: Radical inclusion! The key to unlocking generative potential and systemic transformation	SP 2D: William Smith, Michelle Friend: The Shift to the Fifth	SP 2E: Andrew Wagner: Trauma and Democracy - Exploring the narrative landscape and sensemaking of 350 people in Germany in relation to current crisis and polarization
Tea break / Prepare for Game drive	15:30-16:00					
SIG Sessions 2	16:00-17:00	2A: EP/CSTP 30 Reynolds, M (EP) 20 Pinzon-Salcedo, LA (CSTP)	2B DEI 20 McCulloch, L 20 Hay, A 20 Montero, A	2C: CYB/CSTP 20 Laouris, Y (1) CYB 20 Cotet, C (CYB) 20 Katual, D (CSTP)	2D: SPhil/SESD 30 Swartz, J (SPhil) 30 Sweeting, B (SESD)	2E: SCA/DEI/DPSS 20 Ludikhuijze, H (SCA) 20 Idris, M (DEI) 20 Campher, S (DPSS)
Poster session	17:00-17:20	P1: Poster announcements 10: Kineman presented by G Smith 10: Ariel Leonard				
Dinner & dinner activity	17:30	Game drive and bush braai				
Informal Workshop activity	20:00-21:00					

Activity	Time	Wednesday, June 21st				
		Track 1 Ndlopfu (elephant)	Track 2 Ingwe (leopard)	Track 3 Ndou (elephant)	Track 4 Mhelembe (rhino)	Track 5 Nari (buffalo)
Breakfast	07:00-08:45					
RoundTable before breakfast	07:00-07:45	EVERYONE IS INVITED to our daily equal-turn Reflection RoundTable				
STiP Activity during breakfast	07:30-09:00	Breakfast - meeting of co-inquiry groups; facilitators available. Groups meet for CLS reflection session (facilitator only 'at hand', essentially				
Keynote : Dr Louis Klein and Karima Kadaou	09:00-10:30	In the Mirror of Tamkeen: Growing a Shared Understanding of Societal Metamorphosis or The Gardener AND the Garden, Learning to Speak the Language of "AND".				
Tea break	10:30-11:00					
Research Project: Stephany Peterson	11:00-11:30	Reflective Conferencing				
Mini Workshop and SIG Sessions 3	11:30-13:00	3A: HST 30 Scribante, J (HST) 30 Barnes, L (HST) 30 O'Donnell, J (2) (HST)	3B: DES/SMSE/SIEL 30 Potts, M (DES) 30 Argall, N (SMSE) 30 Gardiner, L (SIEL)	3C: OTSC/GSML/RHT 30 Laouris, Y (2) (OTSC) 30 Cottam, R (2) (GSML) 30 Metcalf, G (2) (RHT)	3D: CSTP/HIS 30 Drevin, L (CSTP) 30 Tuddenham, P (HIS) 30 Coetzee, M (CSTP)	3E: OTSC/SSSS/HS 30 Dostal, E (1) (OTSC) 30 Winn, K (SSSS) 30 Smith, W (SIEL)
Lunch	13:00-14:00	Conference Buffet				
Panel and SIG Session 4	14:00-15:00	The Embodied Professional: systemic beings in motion Joan O'Donnell, Tom Scholte, Raghav Rajagopalan, Rachel Lilley		4C: SACD/AR 20 Smit, I (AR) 20 Love, T (2) (SACD) 20 Buckle, P (SACD)	4D: CYB/AR 40 Fischer, T (CYB) 20 Muller, J (AR)	4E: RHT 30 Metcalf, G (1) (RHT) 20 Keykaan, D (RHT)
Semi-plenary (SP) Session 3	15:00-15:30	SP 3A: Ray Ison: Governing river catchment governing: the case of the Olifants, South Africa.		SP 3B: Ranulph Glanville Memorial Lecture: Leonard, A (OTSC)		
Tea break	15:30-16:00					
Semi-plenary (SP) Session 4	16:00-16:30	SP 4A: Tom Scholte: Perceptual conflict management: A Cyber-Systemic Approach to Conflict Engagement Across the Professions		SP 4B: Jai Clifford-Holmes: Typology of Systems Diagramming Techniques		SP 4C: GSML/SESD 10: Friend, A (1) (GSML) 20: Friend, A (2) (SESD)
Board of Trustees Meeting	17:00-19:00	ISSS Board of Trustees Meeting				
Dinner & dinner activity	Not provided	Not provided by conference - participants eat in restaurant at own cost - free time				
Self-organising Workshops	19:30	Self Organisation Workshops	Self Organisation Workshops	Self Organisation Workshops	Self Organisation Workshops	IFRS: "Growing a community of conversation and understanding: The 2023 agenda for the systems community"

Activity	Time	Thursday, June 22nd AFRICA DAY				
		Track 1 Ndlopfu (elephant)	Track 2 Ingwe (leopard)	Track 3 Ndou (elephant)	Track 4 Mhelembe (rhino)	Track 5 Nari (buffalo)
Breakfast	07:00-08:45					
RoundTable before breakfast	07:00-07:45	EVERYONE IS INVITED to our daily equal-turn Reflection RoundTable				
STiP Activity during breakfast	07:30-09:00	Breakfast - meeting of co-inquiry groups; facilitators available. Planning presentation feedback to conference.				
Janet MacIntyre	09:00-09:15	Introduction to Africa Day Introducing Fhatwani's welcome to country (his family lived here and his ancestor was the Venda King). He visits Kruger each year at the invitation of Kruger Park.				
Keynote (Africa Day) Vhonani Olive Netshandama	09:15-10:15	Social Entrepreneurship in South Africa				
Entertainment Activity	10:15-10:30	Janet inviting our community of practice Vhonani Mphatheleni, Fhatwani and all organic farmers singing Dzumo la Mupo (Voice of the Earth) and teaching everyone (ISSS colleagues) how to sing and dance it.				
Tea break	10:30-11:00					
Africa Day Activity	11:00-12:00	African Day Activity & Panel Janet's two panel presentations in the form of an engaged conversation on gender sensitive praxis and story telling relating to food, water and seed security - plus engagement to prevent destruction of baobab forests and Thathe for smart village powered by coal and diamond mining, respectively. Our growing network supported locally and internationally through pooling our efforts including Earth Life and Earth Rise , Indigenous knowledge Custodians and Organic Farmers network (PGSA).				
Keynote (Africa Day) Rachel Tsakani Lebese	12:00-13:00	Ubuntu in Health Promotion				
Lunch	13:00-14:00	Platter lunch				
SIG Sessions 5	14:00-15:30	5A: EP/CYB/HST 30 Van der Westhuizen, L (EP) 30 Bunnel, P (CYB) 30 Nagraj, S (HST)	5B: 4 DEI/OTSC/DES 30 Preiser, R (DEI) 30 Goede, H (OTSC) 30 Drevin, G; Snyman, D (DES)	5C: SESD/DES/CSTP/SSSS 30 Clifford-Holmes, J (1) (SESD) 30 Manduna, W (2) (DES) 30 Nshimba, C (CSTP)	5D: BIC 30 MacIntyre, J (1) (BIC) 30 MacIntyre, J (2) (BIC) 30 McGill, V (BIC)	
Tea break	15:30-16:00					
STiP Activity	16:00-17:15	Groups provide feedback on the systemic inquiry they conducted during the ISSS Conference (= Assignment 2)				
Dinner & dinner activity	17:30	Boma Braai and Marimba Band				

Activity	Time	Friday, June 23rd				
		Track 1 Ndlopfu (elephant)	Track 2 Ingwe (leopard)	Track 3 Ndou (elephant)	Track 4 Mhelembe (rhino)	Track 5 Nari (buffalo)
Breakfast	07:00-08:45					
RoundTable before breakfast	07:00-07:45	EVERYONE IS INVITED to our daily equal-turn Reflection RoundTable				
ISSS Council meeting	08:00-08:30					
ISSS Board of Directors meeting	08:30-09:30					
Incoming President's Address	09:30-10:30					
Best paper awards	10:30-11:00					
Conference Closure	11:00-12:00					
Lunch	12:00-13:30	Platter Lunch				
STiP Activity	13:30-15:00					

Presenter	Title	Track	Session	Page Number
Keynote addresses				
Ison, R	Professionalising the Systems Thinking Practitioner	Plen	Mon	15
Joseph-Malherbe, S	The leadership imperative and cultivating it	Plen	Tues	16
Klein, L & Kadaoui, K	In the Mirror of Tamkeen: Growing a Shared Understanding of Societal Metamorphosis or The Gardener AND the Garden, Learning to Speak the Language of "AND"	Plen	Wed	18
Lebese, RT	Ubuntu in Health Promotion	Plen	Thur	20
Lilley, R & Midgley, G	Rethinking Systems Thinking	Plen	Tues	22
Netshandama, VO	Social entrepreneurship learning ecosystems, let us also include the forgotten spaces: An invitation	Plen	Thur	24
Njenga, S	An African perspective on leadership and future leaders	Plen	Mon	26
Smith, GR	Towards a unifying framework for system science	Plen	Tues	28

Professionalising the Systems Thinking Practitioner

Ison, R, The Open University, UK

Ray Ison: ray.ison@open.ac.uk
2023 Plenaries: Systems Practice for Professions

Abstract:
Drawing on over 50 years of educating systems thinking practitioners at the Open University (OU) UK, this Keynote will highlight the opportunities and threats that arise in a journey towards professionalisation of systems thinking in practice (STiP). The case of working with alumni and employers to facilitate the creation of a new professional identity, the Systems Thinking Practitioner Apprentice (STPA) in England, will be used to elucidate issues for academics, professional bodies and employers as well as incipient professionals. The experience of developing a new module 'Evidencing systems thinking in practice' for the OU's presentation of the new masters level apprenticeship award will be used to highlight some of the conceptual, methodological and ethical issues that will challenge educators.

Ray Ison was appointed Professor of Systems at the Open University (OU) in 1994. He is a member of the Systems Thinking in Practice (STiP) program involved in researching and teaching, particularly team co-authoring and presenting Post-Graduate modules such as 'Managing Change with Systems Thinking in Practice' and 'Evidencing Systems Thinking in Practice'. These are developed and presented within the OUs MSc and Systems Thinking Practitioner Apprenticeship awards. He has also led and/or contributed to a range of major research, scholarship and teaching programs and projects as part of the Applied Systems Thinking in Practice (ASTiP) Group. His research and scholarship span the biophysical and social and is primarily interdisciplinary, international and collaborative. He is recognised for his work on systems praxeology within rural development, sustainability management, systemic governance and the design and enactment of learning systems, as evidenced in an extensive number of publications. His latest book, co-authored with Ed Straw, ‘The Hidden Power of Systems Thinking. Governance in a Climate Emergency’ was published in 2020. Prof. Ison is the current President (since 2019) of the IFSR (International Federation for Systems Research); he has also served as President of ISSS (International Society for the Systems Sciences) and as a Trustee of the American Society of Cybernetics. In 2022 he was given a Lifetime Achievement Award, by the Systems Society of India ‘for contributions to the transformation of society with a systems approach’.

The leadership imperative and cultivating it

Joseph-Malherbe, S, Letter27, RSA

Suja Joseph-Malherbe: suja@letter27.co.za
2023 Plenaries: Systems Practice for Professions

Abstract:
In the field of engineering, cultivating leadership skills is recognized to be as valuable as developing technical expertise. This holds true for systems engineers at present, and even more so in the future, as the intricacy of engineering challenges increases [INCOSE SE 2035 Vision].

Leadership is a subject that has been studied widely, leading to a multitude of definitions. As a social phenomenon, there is no consensus on what precisely constitutes leadership. In many organizations, leadership is commonly associated with rank and reporting lines. The individuals have formal authority over the people he or she needs cooperation from to achieve specific outcomes. As a systems engineer, a significant aspect of the role involves influencing people without relying on formal authority.

In my address, I explore the leadership imperative and I delve into learning journeys for systems engineers to become more effective at influencing others, even in the absence of formal authority.

Suja has a passion for leadership and systems engineering and as such she is quite active in INCOSE. She is a coach at INCOSE Technical Leadership Institute since December 2020. She was a member of the INCOSE International board of directors, as Chair of the Policy Management Committee from July 2014 to December 2016. She served as the President of INCOSE South Africa from January 2017 to December 2018.

Suja provides training and consulting services in systems engineering and leadership development to individuals and organisations through Letter27. She is also a sessional lecturer at the Faculty of Engineering and the Built Environment at the University of the Witwatersrand delivering post-graduate courses on systems engineering.

Prior to joining Letter27, she was a course presenter at Certification Training International. She was a senior systems engineer with Garmin Stellenbosch, creating first-of-its-kind outdoor and fitness products. She led the management of software releases, including

the testing, deployment, and support of new software. Her experience also includes substantial modelling and simulation, image processing, and the development of technology systems, such as battery packs for the dismounted soldier. This latter work was performed at the Council of Scientific and Industrial Research (CSIR) for the defense industry in South Africa.

She is an INCOSE Certified Systems Engineering Professional (CSEP) and a Solution-focused Brief Coach (ICF-ACSTHs training). She received her B.Sc in Electrical Engineering from the University of Witwatersrand and her M.Eng in Electrical and Electronic Engineering from the University of Johannesburg.

In the Mirror of Tamkeen: Growing a Shared Understanding of Societal Metamorphosis or The Gardener AND the Garden, Learning to Speak the Language of "AND"

Klein, L, European School of Governance, Germany
Kadaoui, K, Tamkeen Community Foundation for Human Development, Morocco

Louis Klein: louis.klein@eusg.org
2023 Plenaries: Systems Practice for Professions

Abstract:
For over 14 years, Tamkeen Community Foundation for Human Development and its partners co-facilitate and co-create, the conditions for the emergence of ecosystems of societal harmony and human co-flourishing in Morocco. The direction of this autotelic process is a humanising society. Its manifestations are the witnessing and experience of metamorphic transformation of communities and societal systems (neighbourhoods, schools, university faculties , education system ...). The Tamkeen Approach and the emerged are consubstantial, come to life together, vivify one another and are concrescent. Tamkeen is co-created as it grows the understanding of its understanding by and with all the partners involved and as it mutually arises and evolves with the interplay of emergence and dissolvence. Tamkeen is its own metaprocess and governance model, dissolving the concept-percept dialectic, appreciating action and reflection as indissociable. It embraces and transcends prevalent notions of social innovation and systems change.

Since 2019, Karima Kadaoui and Dr Louis Klein are working together in what became known as a socio-systemic complexity evaluation (SSCE) embedded in research of the Tamkeen Approach, of metamorphic transformation and of the wonder [KK1] that comes with it. In coherence and congruence with the Tamkeen Approach, the SSCE creates the conditions to grow the understanding of the growing shared understanding from co-reflected lived experiences. It is the mirror to the mirror of Tamkeen, it questions the questions into their evolution and the underlying epistemologies and ontologies, it realises the dissolving distinctions, reflects the dilatation of perceptions and resonates with the spoken language that grows with the unfolding Tamkeen experience. The SSCE safely reveals a silent transformation in the flow-field of its growing resonant expanse, societal metamorphosis.

Dr Louis Klein

Dr Louis Klein serves as dean at the European School of Governance (EUSG) and Secretary General of the International Federation for Systems Research (ISFR).
Educated as an economist and social scientist, Dr Louis Klein became a dedicated systems researcher. He served as director at the International Centre for Complex Project Management (ICCPM), as director at the World Organisation of Systems and Cybernetics (WOSC), and as VP of the International Society for the Systems Sciences (ISSS).
In 2019 Dr Louis Klein retired from the Systemic Excellence Group and the Systemic Change Institute where he managed change projects worldwide as a systems practitioner. He worked in the private and public field as well as for organisations in civil society.
Dr Louis Klein is member of the editorial board of the Project Management Journal (PMJ) and Systems Research and Behavioural Sciences (SRBS) as well as co-publisher of the German philosophical business magazine agora42.

Karima Kadaoui

I co-founded Tamkeen Community Foundation for Human Development in 2009 and currently hold the responsibility of its executive presidency. However, my Tamkeen process story started before, with the lived experience research with Tamkeen co-founding colleagues and friends, in which I weaved the threads of my 25 years experience working in the private sector as a big 5 management consultant and the associate senior consultant of a territorial development consultancy, in the public sector. Here, I worked on public policy and governance as the advisor to the Minister of Employment, Vocational Training and Housing in the Moroccan Government and lived several experiences in the social sector with women working in infra-human conditions in industries and with a community in a major shanty town. However, the most defining experience of all is being the mother of my two daughters Sara and Maria. I am a board member and advisor to Imal Initiative for Climate and Development the first independent non-profit North African climate think tank as well to Africa Voices Dialogue a space where the voices of Africa’s educators and learners are seen, heard and loved. As a facilitator and experience based researcher for over 14 years in Tamkeen, I have the privilege to witness and experience, with different communities and societal systems, how the trust in our humanity and love create the conditions for the emergence of the social ecosystems of our societal harmony and human co-flourishing.

Ubuntu in Health Promotion

Lebese, RT, Uniersity of Venda, RSA

Rachel Lebese: rachel.lebese@univen.ac.za
2023 Plenaries: Systems Practice for Professions

Abstract:
Ubuntu is an African philosophy that describes how human beings can live with each other. Ubuntu is the essence of a human being, the divine spark of goodness inherent within each being. It also promotes interdependence on each other. We live on earth, and we are dependent on the habitat, air, water, animals, and the environment which also influence our health status including health prevention and promotive measures.

This paper will describe how Ubuntu as an African philosophy can be used as a health-promoting vehicle.

The study involves a participatory action research design that triangulated both approaches and used varying data collection and analysis methods. Methods to ensure trustworthiness, ethics, validity, and reliability were applied.

The results show how information can be disseminated within communities from one source to the other through the available community connections. This can be achieved by the development of indigenous songs, role-play, and speeches. Indigenous preventive methods and available resources from our own environment are key to health promotion strategies Workshops are central in the application of Ubuntu values and principles hence important in the transmission of health-related information within communities.

Professor Rachel Tsakani Lebese is a Research Professor at the Faculty of Health Sciences at the University of Venda. She is a licensed nurse. Her PhD was on the development of ‘A model to promote dialogue about sexual health between teenagers and parents/teachers in Limpopo Province, South Africa’. Her research interest is rooted around culture, Ubuntu, sexual and reproductive health, applying community-engaged participatory rural appraisal to address problems identified together with the community. She has led to the completion of several research projects such as breast self-examination, the implementation of a model to promote dialogue between teenagers and parents.

Prof Lebese has over 2 decades of experience in Community Based Nursing Education. She taught undergraduate students, by applying a problem-based community-centred project-organized curriculum. The same engagement is also used for research in trying to revive Ubuntu among communities. Prof Lebese is involved in hospital boards, Ubuntu community movement, and youth ubuntu boot camps, using theatre approaches. To date, she has supervised to completion of 14 master's and 11 PhD candidates and has published 85 articles in accredited journals.

Ubuntu's basis is that taking care of ourselves (human beings) interacting with other human beings, and nature, or the Creator, is to be mindful of our responsibilities towards one another, and towards sustained livelihood. Her scholarly movement is about community Ubuntu, in which she maps the ubuntu ecosystem in Health Promotion. Prof Lebese is a fellow of the Albertina Sisulu SARCHi in Nursing Science. Her community-based work covers Thalamela and Greater Giyani Municipality, least 6 communities, namely Nweli, Malavuwe, Mbahe, hlaneki, Ngove and Sikhunyani. This is an interfaculty-inter-institutional, participatory, transdisciplinary multistakeholder project involving advancing co-creation of knowledge practices that should promote health and healing through the application of ubuntu principles. Professor Lebese's presentation will focus on how ubuntu's philosophy is being revived through the scholarship of community engagement.

Rethinking Systems Thinking

Lilley, R, Birmingham Leadership Institute, University of Birmingham, UK
Midgley, G, Centre for Systems Studies, Business School, University of Hull, UK

Rachel Lilley: r.lilley@bham.ac.uk
2023 Plenaries: Systems Practice for Professions

Abstract:
The transdisciplinary field of Systems Thinking has paid a great deal of attention to the meaning of the word 'systems': we have used the systems idea to better understand complex organizational, social and ecological problems; and to tackle those problems, we have designed various systems methodologies, models, innovations, and leadership practices. However, we have paid much less attention to what constitutes 'thinking', or cognition. Systems theories of cognition, originally advanced in the 1980s, have been validated, further developed and considerably enhanced by forty years of cognitive and neuroscientific research. Appreciating the implications of this research can transform our understanding of systems thinking. This keynote will first explain the science, and will then unfold two aspects of our new understanding: rethinking what systemic self-reflection involves (both in and beyond the context of practice), and appreciating the anticipatory nature and role of all forms of applied systems thinking.

Rachel Lilley

Dr Rachel Lilley is a Senior Fellow at the Birmingham Leadership Institute, a new teaching and research centre in the University of Birmingham, UK, focussing on systems leadership. She is a practitioner-researcher in systems approaches and systems leadership and also Programme Director for an innovative transdisciplinary Master's Programme bringing together Systems Leadership and Systems Practice. Rachel's high impact, world leading, research looks at human decision-making, systems thinking capabilities and behavioural change. It is impact orientated and has supported policy design and practice, community initiatives and leadership development at all levels. She has a particular interest in building capability to address climate and social change. Rachel is an expert in human sensemaking with specialist knowledge in cognition, consciousness and perception, her theoretical expertise is supported and informed by an impressive track record in practicing, teaching and developing embodied perception skills in teams, organisations and individuals. She has over 30 years' experience working with large corporates, public and third sector as a systems practitioner covering community engagement, social issues, climate change, leadership and wellbeing.

Gerald Midgley

Gerald Midgley is Professor of Systems Thinking in the Centre for Systems Studies, Faculty of Business, Law and Politics, University of Hull, UK. He also holds Adjunct Professorships at Linnaeus University, Sweden; the University of Queensland, Australia; the University of Canterbury, New Zealand; Mälardalen University, Sweden; and Victoria University of Wellington, New Zealand. He has held research leadership roles in both academia and government, having spent eleven years as Director of the Centre for Systems Studies at Hull, and seven years as a Senior Science Leader in the Institute for Environmental Science and Research (ESR), New Zealand. Gerald has written over 300 papers for academics and practitioners on systems thinking and community operational research, and has been involved in a wide variety of public sector, community development, health service, technology foresight and resource management projects. He was the 2013/14 President of the International Society for the Systems Sciences, and has written or edited twelve books. These include: Systemic Intervention: Philosophy, Methodology, and Practice (Kluwer, 2000); Systems Thinking, Volumes I-IV (Sage, 2003); Community Operational Research: OR and Systems Thinking for Community Development (Kluwer, 2004); Forensic DNA Evidence on Trial: Science and Uncertainty in the Courtroom (Emergent, 2011); and the Routledge Handbook of Systems Thinking (Routledge, 2023, in press).

Social entrepreneurship learning ecosystems, let us also include the forgotten spaces: An invitation

Netshandama, VO, University of Venda, RSA

Vhonani Olive Netshandama: Vhonani.Netshandama@univen.ac.za
2023 Plenaries: Systems Practice for Professions

Abstract:
South African Higher Education institution are under pressure to adapt to various sustainability and transformation challenges, amongst other to counter challenges posed by unemployment, hunger and the vulnerabilities associated with climate change and pandemics. Organisations such as Universities South Africa (USAf), Technological Higher Education Network of South Africa (THENSA), Entrepreneurship Development in Higher Education (EDHE) are at the forefront of driving and promoting entrepreneurship education. Traditionally, entrepreneurship education was expected and canvassed as a function of business schools. Also, it goes without saying that fewer educators are not equipped to be entrepreneurial in the traditional sense, but require some level of entrepreneurial awareness in order to radiate the adaptive energy to students, colleagues and community members. The forgotten non traditional intergenerational learning ecosystems exist inrural areas.

In this auto ethonographic presentation, I will make reference to the University of Venda, as it grapples with the integration of the third entrepreneurial mission, namely engagement, relevance and socio-economic impact, with limited resources, and historical debts. I will share lived experiences and social entrepreneurial ecosystems (SEE) embedded in local leadership, territoriality and commitments, and how a University engaged research team might serve as an anchor and conduit to sustaibable livelihoods, whilst at the same time exposing students to relatable entrepreneurial experiences. Intentional focus on appreciating adaptive capabilities, frugal innovative and in providing relevant entrepreneurial learning experiences is key for lifelong learning and sustainability.

I will argue that whilst exploiting external opportunities, rather than promoting local leadership is justifiable in one way, in another way it is disemporing and pereperutating colonial ways of learning, exclusivity and inequality, which is unsustainable and tend to fuel ‘the tick box syndrome’, with less tangible returns on investments. This is also an invitation to collaborate within the “forgotten co-learning spaces”

Professor Vhonani Olive Netshandama has over 10 years' experience as a Director for Community Engagement at the University of Venda. She holds a PhD in Nursing Education from the University of Johannesburg. She is the 2016 distinguished women in science, awarded by the Department of Science and Innovation. For over 2 decades, Professor Netshandama has been a lead partner of Sustainable learning environments and other related projects in Education, IKS and Public Health. A decolonial community based participatory researcher with an interest in engaged scholarship, Indigenous Knowledge Systems (IKS), as well as social entrepreneurship learning, research, and innovation, she is active in transdisciplinary post graduate supervision where she insists on innovative impactful participatory design research.

Vhonani is an experienced multiple stakeholder facilitator of co-learning and reflective processes. She has mentored hundreds of students doing community-based work at both undergraduate and post graduate levels. An MiT Innovation leadership bootcamp alumnus, Vhonani has recently launched a collaborative short Social Entrepreneurship course for students, unemployed graduates and communities..

An African perspective on leadership and future leaders

Njenga, S, Henley Business School, RSA

Sammy Njenga: njengasammy@gmail.com
2023 Plenaries: Systems Practice for Professions

Abstract:
This keynote address will seek to tell the story of a systems thinking practitioner from an African perspective. The speaker who is working in the field of leadership development is wrestling with questions of the silence of an African voice within the field of systems thinking approaches. A simple online search reveals a lack of material and publications on the application of systems thinking approaches that are written with the continent in mind and that take African philosophies and worldviews seriously. Furthermore, questions continue to be raised about the lack of relevance of many leadership and development programs available at African business schools. It seems that the quest for international standardization and accreditation may be driving the perceived lack of contextual relevance. Yet, the challenges that we face as a continent and specifically within the field of leadership development defy simplistic linear solutions. It is for such messy situations that systems thinking approaches are best suited. The address will seek to position African philosophies like Ubuntu and Ukama as useful contributors to the understanding of systems thinking and the practice of leadership development. Both Ubuntu and Ukama are founded on the understanding and practice of interdependence, relationality, and communitarian living. Importantly, the discussion will seek to showcase some of the practices within traditional Africa like storytelling as well as the use of metaphors, and how they can be powerful tools for systems thinking practitioners. The session will also explore the power of the right question in guiding systemic inquiry and awareness.

Samuel (Sammy) Njenga is a Kenyan national living in South Africa. He is a leadership and management consultant involved in areas of leadership development, change management, organisational viability, strategic alignment and organisational transformation. His interests include African perspectives on systemicity as well as how to promote workplace learning. Sammy leads Systems Thinking Africa (STA), an organisation which facilitates transformative conversations inspired by Africa philosophies (including Ubuntu, Utu and Ukama) in order to support systems practitioners in addressing complex and messy challenges. Systems Thinking Africa recently launched STA NextGen- a youth-led initiative to teach and support young people in understanding and applying systems thinking approaches to the complex issues they face.

In seeking to build its body of research and academic base, Systems Thinking Africa also partners with other systems practitioners including Dr. Martin Reynolds of the Open University, UK. Sammy is a senior faculty at the Henley Business School Africa where he facilitates on a number of management development programmes.

Sammy also lectures at the University of Stellenbosch Business school as well as the University of the Free State Business School. He is a student of Systems theory and Practice and has a Bachelor's of Education (Hons), an MA in Organisational Leadership, a Master of Commerce in Organisational Management and Systems, and is currently doing a PhD through the University of the Free State Business School. He is using systems thinking approaches to look at short learning programmes in business schools and their relevance to learning in the workplace.

Towards a unifying framework for system science

Smith, GR, INCOSE, UK

Gary Robert Smith: grs0036@gmail.com
2023 Plenaries: Systems Practice for Professions

Abstract:
Gary will give voice to a candidate framework for system science that organizes system knowledge along two dimensions: 1) knowledge about systems and 2) knowledge about the general human activity system. An explanation shall be provided how these two dimensions can be integrated such that systems thinking, systems engineering, project management, and other human enterprise practice frameworks can be grounded, and related to knowledge about systems. The unifying framework can enable system researchers to connect and integrate their knowledge and efforts within the context of an overall whole, an enterprise of system science. The framework can help practitioners identify how 1) behaviours, structures, processes, and meanings emerge, and 2) how diversity can turn to complementarity, collaboration, and synergy. When you place this diversity in the context of the whole, it brings forth connections, possibilities, and deeper meaning.

Gary Smith is a Senior Expert Systems Engineer at Airbus Defence and Space. He is their overall architect for engineering processes and provides technical leadership in the digital transformation of the division. He is an INCOSE certified Expert Systems Engineering Professional and a senior editor of the Systems Engineering Body Of Knowledge. Since 2019 he has been the VP for Systems Practice at the ISSS and their relationship manager with INCOSE.

Systems practice has been a continuous theme through Gary's life experience. He began his career as a lab technician in industrial chemistry at the age of 16, he taught himself how to write software applications in the early 80s, and then after his chemistry degree moved on to relational database systems, software development and project management. As a Project Manager, he was responsible for the delivery of telecommunications infrastructures across Europe before taking on the corporate leadership of the PM discipline. Later, Gary was recruited by Airbus to develop the discipline of technical management and worked to bridge the SE and PM disciplines. During this time with Airbus, he has had several roles as Chief Engineer and Architect of Systems Solutions.

Gary is a system junky, his passion extends beyond his professional work and into areas of personal interest to understand the nature of things, to appreciate complexity and to address the big ‘why’ questions. Since the early 2000s Gary has been applying systems thinking to topics such as cancer, inflammation, sepsis, pre-eclampsia and presented to the ISSS on this topic at their Washington conference – “Understanding disease with Systems Thinking”. When asked why he has this passion, he will talk about his parents, his uncle and grandparents, the chemistry set that he got at 14, Thunder Birds, Star Trek, Carl Sagan, Douglas Adams, Isaac Asimov, and a wide selection of Sci Fi books.

Working across and with several organisations and contributors, Gary has been applying systems approaches and processes to integrate system science, systems thinking and systems practice. This effort has included co-leadership of two IFSR conversations “Unity in diversity” and “What is System Science?” When asked why he does this stuff, “well, it’s what I have to do, it’s who I am”.

Ranulph Glanville Memorial Lecture

EcoAffiliates: a Viable System Model Interactive Cast Study

Leonard, A, Team Syntegrity International, Canada
Laouris, Y, Future Worlds Center, Cyprus
Metcalf, G, Interconnections LLC, USA

Allenna Leonard: allenna_leonard@yahoo.com
2023 OTSC: Organisational Transformation and Social Change

Abstract:
EcoAffiliates is a small environmental organization focused on inspiring action on the protection of water and climate change through the arts and education. It has a three person staff, two of whom are part-time. It was recently awarded a grant to develop a series of videos on different aspects of the environmental challenge. These would be shown at schools, community groups and to the public in indoor and outdoor venue with discussions, Q and A and recommendations for collective actions. It would also continue with its current activities: a mini-film festival and community film showings , a school film project, its e-publications and its experiential afternoon retreats.
Looking at it through a VSM lens we turn first to its environments and then to its place in several recursive structures. We then proceed to consider questions, options and actions from the perspective of each of the System One through Five questions and to look at its potential futures.
Participants will be encouraged to help fill out a VSM based on a set of questions for each system and recursion.
At the end of the presentation, participants will have a taste of doing a VSM diagnosis and set of questions and recommendations.

ISSS 2023 Conference Reseach Project

Seeing the nose on your face

Peterson, S, University of New Brunswick, Canada/North-West University, RSA Visiting Research Scholar

Stephany Peterson: stephany.peterson@gmail.com
2023 CSTP: Critical Systems Theory and Practice

Abstract:
Being a professional is in part the accumulation of dedicated and relevant expertise of a particular perspective. This knowledge contributes to capability (know-how), competence (know-why), and capacity (know-what) for addressing problems within the field. Without reflective practice as a complement, such a perspective can focus too narrowly to appreciate what emerges from systems capable of producing complexity.
Said differently, do you see the nose on your face?
Though our noses occupy 35° of visual field, perceiving it is filtered out of our sensory processing. Our nose is considered expected input, so we do not notice it. We liken reflective practice as a way to curtail this predisposition for patterning information, so expected and unpredictable input remain at the same level. This is applicable to professional perspectives accounting for what is presumed obvious but from a more comprehensive whole, is emergent.
The practice of reflection is your brain's way of deliberately processing what has and is occurring into more useful and helpful ways. This ordering is not a retelling of events for better recall: used consistently, it informs future actions. Used deliberately, reflection disrupts patterns of perception to articulate questions that account for the systems from which they emerge.
This approach is fundamental to the research enterprise in pursuit of inquiry: "what don't we know that matters?" Drawing on interdisciplinarity, the session will describe and explain reflective theory (Dewey), practice (Schön), praxis (Freire), and boundary tensions (Ulrich) as part of what/when/where/who/why/how the conditions for change are met and investigated as processes.
Reflective practice as a disposition of professionalism ensures we learn from our experiences and knowledge to inform the integration and implementation of emergent perspectives into enacted and adaptive systems. This informs decision-making for professionals whose work is necessary but insufficient as a singular perspective for addressing complex problems.

WORKSHOPS

Organization Engineering in practice: Designing a paradigm for Systems Science

Argall, N, University of Hull, UK

Nick Argall: nargall@gmail.com
2023 SMSE: Systems Modelling and Systems Engineering

Abstract:
Organization Engineering is an emerging methodology for controlling professional work that asserts “Work is perceived to be meaningful when there is appropriate creative freedom.” At the core of the methodology are a set of defined limits to creative freedom that are intended to focus creativity on the outcomes sought by the organization. At present, there is a shortage of case studies and non-anecdotal evidence.
Some members of the International Society for the Systems Sciences believe that the Society would benefit from a governing philosophy (a paradigm). At this workshop, members will be asked to follow the Organization Engineering methodology in designing one or more candidate paradigms for Systems Science. Feedback on the usefulness of the methodology and perceived usefulness of the candidate paradigm(s) will be sought.
(Members will be able to preview the effectiveness of the ‘cognitive layering’ hypothesis and ‘Variety Comparison Grid’ at the pre-conference symposium on the 13th of May, 2023. The target for the workshop is to propose a cognitive tool that occupies the ‘4/4’ position on the grid and has associated features to be decided by the attendees.)

Typology of Systems Diagramming Techniques

Clifford-Holmes, J, Nelson Mandela University, RSA

Jai Clifford-Holmes: jai.clifford.holmes@gmail.com
2023 SESD: Socio-Ecological Systems & Design

Abstract:
In inter- and transdisciplinary work, systems diagrams are frequently used as integrative devices and boundary object. 1 However, many different approaches to systems diagrams and systems diagramming exist, which hail from many different fields and disciplines. What a 'systems diagram' means in one context versus what it means in another can therefore vary greatly and it can be difficult for both researchers and practitioners to know which approach to select, when, and for what purposes. These difficulties are compounded by the fact that what is defined as an 'influence diagram' by one author may be a described as a 'causal loop diagram' by another (for example) and, given the ambiguities of terms such as 'systems map' and 'systems diagram', judging the quality of a diagram is not an easy task.
There are appears to be a gap in the comprehensiveness of the featured techniques, the way these techniques are comparatively discussed and the rationale for how the techniques were selected and categorised. The workshop would aim to:
1. Introduce the Thinking in Loops project, providing the rationale for how this differs to existing available resources;
2. Describe the method of selecting and classifying techniques;
3. Present the classificatory criteria and the resulting typology of systems diagramming techniques (divided into the categories of 'candidate techniques', 'core techniques', and 'supporting techniques'); and
4. Facilitate a discussion of the typology, and associated criteria, enabling feedback from ISSS members and conference.

Radical inclusion! The key to unlocking generative potential and systemic transformation

Gardiner, L, Centre for Systems Studies, Business School, University of Hull, UK

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2023 SIEL: Systemic Innovation, Engagement, and Leadership

Abstract:
Traditional science paradigms dominate the academy and emphasise – if not expect – third person accounts, effectively marginalising the validity of personal knowing. Some systems thinking, cybernetics, systemic interventions and complexity approaches recognise the flaws in obviating the subjective-empirical dimension, yet virtually none offer simple, practical ways to fully leverage its inclusion amidst daily life, work and research – wherever we are, whatever we are doing.
In my doctoral research, I took on an ambitious challenge to (a) explore what it might mean in theory, and deliver in practice, to re-incorporate personal knowing alongside second and third person sources; and (b) to do so, by embracing and embodying the complexity I was experiencing in and as a 'complex living system'. This called on me to surrender to 'not knowing' and to let this be my guide.
In this participatory workshop – if you are willing to engage in the unexpected – I will offer you an experience that will illuminate the generative potential of radical self-inclusion and demonstrate its necessity in catalysing personal and mutual contextual learning/transformation. I will give you a taste of this through a multi-modal, 'metalogically coherent' approach.
But do be aware – what you experience may disrupt your beliefs and expectations of what it means to work systemically. Indeed, you may find yourselves questioning the very foundations of your favoured ways of undertaking systemic work!
Depending on what beckons for our attention in the session, we may touch upon any or some of the following novel contributions arising from my research:
• Systemic Research Framework
• Presence in Action
• Symmathesic Agency
• Metalogic coherence
• Re-formulation of abduction
Those signing up to this workshop will be given access to additional links that will elaborate on all these concepts and associated frameworks. Do respond to my invitation so we may dance in Skukuza!

Towards improving the visibility, impact, and societal contributions of ISSS

Laouris, Y, Future World Centre, Cyprus

Yiannis Laouris: laouris@futureworldscenter.org
2023 OTSC: Organisational Transformation and Social Change

Abstract:
The 2022-2023 President, Roelien Goede, set a vision for her presidency and the society to explore different perspectives on systems. Personally, and collaboratively, we embarked on a journey of exploration and learning, resulting in becoming aware of a plurality of different methodologies. When listening to our mini-symposia speakers, many of us tried to make sense of how we fit the speaker's orientation.

Roelien invited ISSS members in March and the speakers of the earlier mini-symposia to use sessions organised as workshops to explore the methodologies in action. The process continues during this workshop at the annual conference. The facilitation methodology will be an implementation of the methodologies we explored (facilitated by Yiannis Laouris).

Finding synergy is more pragmatic when the methodology is applied to a specific situation. The situation we selected is to investigate how the ISSS can expand its visibility and become more influential in addressing contemporary complex global challenges. By selecting this topic, we work on the synergy of the methods and gain benefits for the ISSS itself.

The work started in April during the sessions is continued with a workshop for those present at the conference as a smaller face-to-face meeting. This group will report to the online group as work continues after the conference.

Perceptual Conflict Management: A Cyber-Systemic Approach to Conflict Engagement Across the Professions

Scholte, TD, Department of Theatre and Film - University of British Columbia, Canada

Thomas Donald Scholte: tom.scholte@ubc.ca
2023 CYB: Cybernetics and Systems

Abstract:
Some professionals have got a “short fuse” or “hair trigger” that gets them into trouble with colleagues. Others’ fear of being disliked or disapproved of by their peers makes them swallow their most urgent thoughts and ideas. Those in managerial positions often find themselves drained from having to manage “difficult” people or trying to lead a team so afraid of rocking the boat that no one will speak up and say what needs to be said.
In all these guises, and many more, an inability to productively engage with conflict can have profound systemic impacts on organizations by undermining retention of valuable personnel, stifling creativity, eroding productivity, and much more. It can also completely derail the careers of individual professionals.
This interactive workshop will offer concrete tools to transform workplace conflict from something to be avoided or “won” at all costs into generative opportunities to build mutual understanding and a clearer path to success. Combining cutting edge psychological theory with engaging practice exercises, this session will introduce the Perceptual Conflict Management Technique: an original and innovative new model of conflict engagement blending William T. Powers’ Perceptual Control Theory with insights from Radical Constructivism and Second-Order Cybernetics regarding the circular way our observations and our mental-models determine each other in a recursive and reflexive manner.
By focussing upon the unique ways that individuals perceive conflict situations and interrogating the way these perceptions are used to construct observations and assessments, this method gently guides us to more clearly articulate the higher principles we hold and understand how they have been disturbed. At the same time, it helps us to cultivate curiosity regarding the higher principles of those with whom we find ourselves in conflict. Finally, it equips all parties to communicate across difference and move forward in ways that can mutually preserve the equilibrium of those combined higher principles.
Participants in this workshop will leave equipped with the basics of this effective, clear, repeatable, transferable and deeply practical approach to all manner of workplace conflict, either as a mediator or a direct participant.

The Shift to the Fifth

Smith, W, ODII Organizing for Development, USA
Friend, M, George Washington University, USA

William Smith: william.smith@odii.com
2023 SIEL: Systemic Innovation, Engagement, and Leadership

Abstract:
Work on system integration in the whole field of systems and organization has reached the limits of the concept itself. We are producing products that are an integrative mix of theories, models, methodologies, and best practices that are so complex that people have difficulty understanding and knowing what to do with them. We produce models and processes that may fit together but don't' always grow or function well together as coherent whole systems.
This result is not for lack of wisdom, intelligence, or resourcefulness from our theorists, designers, managers, and facilitators but from evolution itself. We have not yet evolved collectively an overarching or higher dimensional philosophy that would provide the increased capacity or power to resolve issues of wholeness that are unresolvable at lower dimensions.
This research aims to further develop and test frameworks, as systems of systems, that naturally emerge from more holistic, philosophies.
1. We will use the conference as the system for exploitation.
2. We will present initial findings on the five dimensions of power that drive the more spiritual, scientific philosophies.
3. We will use those lenses to explore, discover and compare ideas, mindsets, models, and practice, and experiences in areas of our interest
We will meet, as we can, during the conference, and by Zoom after the conference to compare notes and contribute to a first communication on our findings. If the results warrant it, we will begin preparation for a funded research project.

Trauma and Democracy - Exploring the narrative landscape and sensemaking of 350 people in Germany in relation to current crisis and polarization

Wagner, A, European School of Governance, Germany

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2023 SACD: Systemic Approaches to Crises and Disasters

Abstract:
How can a complexity perspective enhance understanding and integration of collective trauma?
Can understanding and dealing more consciously with collective trauma dynamics help to strengthen our democracy and overcome polarization?
The initial questions emerged through the consideration that in increasingly complex social situations the development and negotiation of meaning and meaningfulness is an essential feature of political processes and decision-making. At the same time, crises can act as catalysts off fragmentation, and may evoke unprocessed traumatic material stored in collective memory. Based on the results of a large group online process in 2022, initiated by Thomas Hübl in Germany, possible connections between polarization and collective trauma dynamics in times of crises were explored.
The theoretical basis of the research project links different approaches, including those from political science, sociology, psychology and trauma research aiming to combine a systemic and complexity perspective. “Sensemaking“ functions as a connecting key concept, which can be found in all the disciplines mentioned and thus enables a systemic bridging function. At the center of the research on trauma, polarization and democracy presented are the experiences and attributions of meaning of the participants in the form of stories (narratives). Narrative landscapes emerge as participants self-assessed their micro-narratives in terms of qualities of experience that were essential to them by using the SenseMaker Software of CYNEFIN (Dave Snowden). This allowed to to see how through enabling constraints to see the overall patterns of the narrative landscape consisting of individual micro-narratives before, during and after the collective trauma integration process.
The research project therefore aims to make a fundamental contribution to the elaboration of patterns, trends and interrelationships in the complex assemblage of trauma, crisis and democracy. It is thus a pioneering piece of research to encourages further research into mentioned interrelationships and practical applications of collective trauma integration in social systems. You are invited to an exploration of mutual sensemaking and dissolving of traumatic memories in the context of polarization, democracy and current crisis.

SIG SESSIONS PAPERS

Organization Engineering: A language in progress

Argall, N, University of Hull, UK

Nick Argall: nargall@gmail.com
2023 SMSE: Systems Modelling and Systems Engineering

Abstract:
Software development is a professional discipline that routinely develops structured models of work, and yet structured models of software development have been plagued by failure. "Organization Engineering" is an approach to understanding how people, machines and work fit together in the real world. Anecdotally, OE models have successfully predicted the success and failure of: efforts to import systems into other systems, organizations and their structure, dispute/conflict resolution, and cross-silo communication. This workshop aims to communicate the OE hierarchy models to participants and invite them to indicate opportunities to expand the evidence base beyond personal anecdotes.

Approaching the Blood Transfusion Continuum as a System: Action Research to foster the emergence of voluntary blood donation

Barnes, L, LS Barnes Consulting, USA

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2023 HST: Health and Systems Thinking

Abstract:
Delivery of health care requires the availability of an essential medicine, human blood, to enable life-saving blood transfusion. Voluntary non-remunerated blood donation forms a cornerstone of safe, sufficient, and sustainable blood for transfusion availability. To formalize voluntary blood donation, the literature describes the need for governance structures and stewardship processes. However, the study of how governance structures and stewardship processes contribute to the achievement of voluntary blood donation from healthy community members is wanting. A case study of Caribbean blood systems described the governance structures, stewardship processes, and the ensuing implications for achievement of voluntary community blood donation. The findings from the case study revealed that adoption of governance structures significantly correlated with proportion voluntary community blood donation. Additionally, stewardship processes including alignment, regularities, and partner engagement emerged as dominant themes derived from multidisciplinary interviews of key informants across the case countries. Interestingly, the presence of both governance structures and stewardship processes enabled partnership engagement as a platform for multi-disciplinary, multi-level agents to establish regularities aligned with the achievement of voluntary community blood donation. Specifically, this transformation involved moving from a blood donation model triggered by an immediate family's members need for blood transfusion to a more preemptive that approach broadly engages community in the accountability for the blood transfusion availability, leveraging all levels of society. The findings describe recommendations for future examination, research, and exploratory actions may be best satisfied through Action Research.

Reflection on Systems Guilt from the Perspective of Analytical Psychology

Buckle, P, Adelphi University, USA

Pamela Buckle: buckle@adelphi.edu
2023 SACD: Systemic Approaches to Crises and Disasters

Abstract:
Decades ago, European academics began using the term problematique to describe their unease about “a set of 49 interrelated global problems” (Ison 2023) – widespread issues of pressing concern to humanity and our planet. The Club of Rome brought this global problematique to the attention of the wider public, outlining political, social, economic, technological, environmental, cultural, and psychological problems that need solving. The interconnectedness of these problems became increasingly apparent, as did the visceral understanding of their urgency to people across the globe. To the word problematique was added words like ‘polycrisis’ – “the simultaneous occurrence of several catastrophic events” (Collins English Dictionary), a term in use since the 1990s, and more recently popularized at the January 2022 meeting of the World Economic Forum in Davos Switzerland. As these ideas – problematique, concern, urgency, crisis – have become part of the conscious landscape, they have evoked dread, of course. They have also evoked, in many people, a deep commitment to understand and overcome them. From the first use of the term global problematique, there has been the conviction that systems approaches – myriad ones from which to choose – should meet these pressing demands. For many systems people, problem became inspiration, dedication, even enthusiasm, to find and disseminate solutions.
Yet as decades pass, many confess that we are making little progress in that finding and disseminating (Ackoff 2006; Hillman & Ventura 1993). Systems thinkers may have taken up the gauntlet, but to date, have not won the duel. Now, in often quiet conversations among systems adherents, some are daring to admit their profound discouragement, their failure of personal responsibility to find solutions so effective and so persuasive that the worsening trajectory of global problems can be slowed, can be reversed. And so, to admit the continuance of the global problematique is to admit – privately or publicly, consciously or unconsciously – our guilt for not preventing it.
This paper will examine guilt as one psychological aspect of today’s systems sciences community.

Language as an Enabling Constraint in Systems Sciences

Bunnell, P, Royal Roads University, Canada

Pille Bunnell: life.works@mac.com
2023 CYB: Cybernetics and Systems

Abstract:
I considered using the more dramatic title “Language, our Gilded Cage” but that would imply that we were feeling caged, and the problem is more that we are usually unaware that language imposes constraints on how we think and act, even as it is central to all that we do. What language enables is clearly apparent, as is evidenced by the vocabulary and the attendant conceptualizations we use in systems studies. What language constrains is far more difficult to see.
Maturana’s insight that every distinction co-arises with the domain in which it is accepted as valid is useful here. He also pointed out that each distinction reveals some dimensions of regularity while obscuring others. Thus as we name, we create the domains or contexts in which those named things and ideas make sense. What we do not recognize easily is how else we could have named things, in particular non-tangible things, nor do we readily see how this determines what do do and how we do it. I will show examples of how language “chunks” experience, and how those chunks are then taken as given and become attractors for the paths of further actions and ideas that are coherent with the particular distinctions made. As meanings coalesce within frames of relevance, other possible meanings are obscured. Ideas, insights and potential actions may be lost between the chunks, especially as these become rigidly defined and thus alternatives are effectively denied existence.
How do the distinctions we use in systems sciences bias what we can do and how we do it? What for example, do distinctions such as causality and feedback, variable, state, and process, or even the word “system” enable and constrain? What possibilities are made either visible or invisible by how we understand and use these words? Further, how do the models we generate based on these words blind us to what else may be important to how we conceptualize and work with systems.
In practice we are not always blinded and constained by existing lineages of definitions. In conversation we can attend to what lies between or outside our distinctions. Significantly, language also enables reflection; it allows us to “step out” of what we think and see it from a new perspective. Reflection enables us to envision and generate alternatives. This is where systems thinking becomes key, especially if we avoid the hubris of assuming that the distinctions, including the system, its elements and their relationships have a transcendental existence rather than being a manner of engaging with the rich complexity of our world. In this respect what I am concerned with is an epistemological issue. In conclusion I conjecture that reflective use of the distinctions relecant to systems sciences can incorporate many implicit dimensions of understanding that go beyond how we speak and write about systems.

Systems thinking for intelligent data warehousing – designing and modelling for the future

Campher, S, North-West University, RSA

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2023 DPSS: Digital Product-Service Systems (IS and ICT)

Abstract:
Data warehousing, as an architectural approach, comprises methods and practices for collecting, integrating, managing, interpreting and using data in support of analytics and business intelligence. The challenge of data warehouse development and content management has escalated in the era of big data with masses of fast-moving heterogeneous data sources. As organisations attempt to exploit this ever-growing complex and dynamic data sphere, traditional data warehousing approaches and practices seem to produce systems that are inflexible and unable to scale. Intelligent data warehousing with higher levels of automation may be achieved through data semantification – enriching data with its context and meaning – and developing a solution for incorporating it into data warehousing. Since semantic heterogeneity (or semantic relativism) as well as structural heterogeneity in various data models must be assumed, designing a solution is considered a wicked problem: the objectives are vague, and the consequences of a specific solution are boundless over time and application domain. This reflective paper describes how systems thinking and practices may be incorporated for developing a conceptual model for semantic data warehouse content management in support of automated dimensionalisation. Antireductionist views are used to guide the development of an ontology for dimensional modelling design patterns, concepts, and categories. They are also applied to the design and modelling considerations of data warehousing involving semantic web technologies, linked data, and the concept of a data mesh or fabric.

A systemic analysis of participatory land and water governance in the Tsitsa river catchment, South Africa

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2023 SESD: Socio-Ecological Systems & Design

Abstract:
Participation of diverse stakeholders is essential for adaptive governance of land and water resources, along with the complex social-ecological systems in which the resources are embedded. Local manifestations of participation vary considerably. Successful resource governance requires arriving at compromises and trade-offs. This paper documents the findings from a systemic analysis of participatory governance in the Tsitsa River Catchment in the Eastern Cape of South Africa. A multi-method approach was designed to compare mental models elicited from actors with narratives crafted from participant observation data. Here, we focus on meaningful participatory governance that we define as being intelligible and significant to the actors involved as well as relevant to and coherent within a broader, multi-level governance system. The findings suggest that while there are multiple available options for enabling participation, there are also multiple obstacles inhibiting participatory governance. Challenges relate to accessibility and mobility, allocation of governance capacity, change resistance to power sharing, and persistent mental models that perpetuate old habits. Despite widespread support for more participation in governance, the application of participatory approaches should avoid becoming box-ticking exercises that are tokenistic or manipulative. We highlight the importance of context for enabling meaningful participation and the need to pioneer appropriate analysis methods.

Multi-dimensional analysis of the conflicts over the Grand Ethiopian Renaissance Dam

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Abstract:
Led by Ethiopia and situated in the upper reaches of the Nile River Basin, the Grand Ethiopian Renaissance Dam (GERD) is the largest hydroelectric dam in Africa and one of the ten largest dams in the world. The dam has been controversial since its inception, with many of the interested and affected stakeholders holding competing views, with many uncertainties involved, and complex historical pre-conditions. These factors, alongside many more, have resulted in key stakeholders adopting adversarial over collaborative positions. Ethiopia, Sudan and Egypt have failed to form an effective multi-lateral transboundary river commission and a viable agreement for how the dam, and the water therein, should be managed, in spite of sustained mediation attempts from the African Union, the US government, and the World Bank. Understanding the multi-dimensional nature of the conflict over the GERD is required in order to move towards a negotiated agreement. Interdisciplinary systems thinking can be used to conceptually represent the domains of the problem, which cross socio-historical, institutional, economic, environmental, and technical categories. To this end, a systemic assessment of the GERD is undertaken by combining a desktop literature review with a suite of systems diagramming techniques. A typology of systems diagramming techniques is used (which will be presented in an associated workshop at the ISSS Annual Meeting), featuring five 'core techniques' (including systemigrams, influence diagrams, and causal loop diagrams) and six 'supporting techniques' (including systems boundary maps, causal chain analysis diagrams and cognitive maps). Different aspects of the GERD problematic situation are represented using the multiple techniques, with the relative strengths and weaknesses of each technique discussed alongside the insights arising from the resulting diagrams, both individually and as a set. The paper concludes with a discussion of how systems diagrams are used for exploring, analysing and representing complex problems more broadly.

Co-creating anticipatory heuristics and becoming praxis: A provisional framework for systems practitioners

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
Traditional approaches to creating systemic change through change agents have failed or are limited in creating lasting change. This is due in part to the static and individualistic understanding of identity traditionally ascribed to change agents, as well as the dominant paradigm that assumes linear cause and effect approaches can be enhanced by technical skills. Systems scholars have contributed theoretical and practical insights that focus on the importance of sense-making in the complex and uncertain world. In this presentation, we argue for a complexity-informed understanding of identity to inform alternative modes of systemic change and becoming praxis. The paper adopts a critical complexity-informed approach to understanding identity and explores how change agents can develop a relational and dynamic approach to change agency and becoming praxis. We will explore provisional relational heuristics that confirm the importance of complexity-informed change agency principles such as embodying relationality, wayfinding ambiguity and incongruence, sense-making, meaning-making, and co-creating anticipatory heuristics. Drawing on the action research method of co-operative inquiry, findings will be presented to illustrate how systems practitioners can co-create different propositional, experiential, practical, and presentational knowledge with a community of practice in various settings. The paper will contribute to systems practice for professions by offering provisional imperatives and critical complexity understanding of change agents, and alternative modes of becoming systems practitioners based on five principles and provides a framework for processual modes of becoming praxis.

Connect to be the future: a critical systems approach to conference organisation

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
The problem this research addresses is how to organise an academic conference that caters to distinct streams, such as computer science and information systems, with the topic "Connect to be the future". These fields share a common thread of computing systems but have very different natures, making it challenging to ensure all participants feel catered for successfully. The task of organising the conference is often placed on an academic with a specific worldview who may fail to consider the limitations they impose on the conference direction. To widen the conference organiser's perspective and ensure all stakeholders are considered holistically, this research will use Churchmann's systems approach and critical systems heuristics. By modelling the conference organisation as an open system, this research will examine its components, activities, objectives, and performance measures. The system environment and constraints will also be determined, and how system resources will be managed. By taking a holistic view of the system and considering the perspectives of all stakeholders, it becomes possible to design a conference that caters to everyone's needs and interests. Additionally, critical systems heuristics will be used to apply twelve questions to make explicit the everyday judgments on which the conference organiser relies to understand their situation. Conference organisers can then challenge their assumptions and those of others involved in the conference to identify limitations and opportunities that may have been overlooked. This research aims to result in a new approach to conference organisation that considers it an open system interacting with its environments to provide a satisfactory experience to all participants. By minimising the uncertainty surrounding the dynamic changes in different conference streams, the survival and growth of the conference can be ensured. Overall, this research highlights the importance of adopting a systems thinking approach to conference organisation to cater to all participants successfully under a singular theme.

Physics and Beyond

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2023 HS: Holistic Systems

Abstract:
It is long overdue that humanity had a common set of principles for all the systems of matter in the universe. All systems are made of the same atoms so it is logical to conclude there are common principles for common matter.
There are two big clues which lead to a consistent answer,
1) The General Theory of Relativity.
2) The Theory of Chaos.
It has recently been realised that these two theories are based upon common principles, and these principles can also be seen in chemistry and biology.
This paper puts its finger right on the misunderstanding which is causing the isolation of the sciences. When it has been revealed the foundations of scientific unification can be put in place.
When given the right evidence in plain language we can all make up our own minds about the logic of truth. Our description of nature has to match observation, it is that simple.

From Chaos to Control: A Scoping Review of Cybernetics and System Thinking as Enablers for Rail Infrastructure Resilience

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2023 CYB: Cybernetics and Systems

Abstract:
Rail infrastructure plays a critical role in transportation, commerce, and society. Nonetheless, extreme weather events and other unforeseen disturbances can cause significant damage, disruption, and safety risks, resulting in significant economic and social repercussions. A prime example of such event is the tragic Stonehaven derailment in 2020. This has launched Network Rail and Department for Transport in creating an independent evaluation that highlighted the necessity for more resilient and adaptive rail systems that can withstand the increasing frequency and severity of unpredictable weather patterns. In this regard, rail management must make difficult decisions to ensure safety and service continuity while minimising costs and impacts.
This scoping review examines how cybernetics and system thinking can facilitate such decisions in the face of uncertainty and complexity. It investigates various approaches, models, and frameworks that integrate these principles into organizations through a broad literature search and synthesis. The emphasized areas of scrutiny are decision-making, risk assessment, and maintenance optimisation in the presence of data uncertainty, incomplete or inaccurate data, and unpredictability in environmental change. The findings of this review can inform and direct future research and practice in the adaptation of rail infrastructure, particularly in light of climate change and other global challenges. According to our analysis, cybernetics and system thinking offer promising avenues for addressing the inherent difficulty and variability in rail management. By enabling decision-makers to identify and respond to changing conditions in real-time, these approaches can aid in preventing and mitigating disruptions, thereby lowering the risk of accidents, and boosting the dependability of rail infrastructure.
Our investigation lays the groundwork for future research in this area by highlighting key directions and identifying potential application areas. We hope that this work will ultimately contribute to the development of comprehensive tools and practices that enable more resilient and sustainable rail operations, allowing communities to adapt to the challenges of an uncertain future.

Multilevel Physical Structures and Stable Disequilibrium Systems

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2023 GSML: General Systems Mathematics and Languaging

Abstract:
Computation as we know it is derived through organism computation from quantum mechanics, not the other way round! Biological computation appears to depend on chaotic resources. The model hierarchical representation of an organism is difficult to visualise, although we rely on this view habitually: how? We cite a general relationship in Nature between the local and the global, and question its relevance to business and industrial organizations. Ervin Bauer in 1935 pointed out that living systems are in stable disequilibrium. Should this character apply to large organizations as well? We present a computational argument for the temporal dependence of such stability, and question how its stability can be moderated.

Multilevel Information Structures

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
We target the reaction to threats to life or organizations, in terms of two timescales. There is a consequent trade-off between speed and precision, related to 'fear learning'. 'Aquarium' is a multilevel reaction 'machine' derived in 1991 from optical computation. A consequence of complication is that organizational levels may be inaccessible, and we relate this to experience in IMEC – a very large Belgian R&D company. Transit between adjacent organizational levels in a model hierarchical representation of an organism can be related to 1+1=2, and possibly resolved through a generic form of quantum error correction. The model hierarchy cedes two partial hierarchies, whose recombination provides the most complete formulation of subjective information, rather than the less complete objective result of Shannon's derivation, for example. We indicate similarity between the model hierarchy and the logistic plot.

W/Holistic Participatory Democracy

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
The application of Biomatrix Systems Theory to the governance of societies gives rise to the model of a W/Holistic Participatory Democracy.
This paper describes the four facets of such a democracy and the purpose, functions and governance structures associated with each.
Facet 1: Functional Stakeholder Governance: This aspect of democracy is concerned with the governance of each societal function.
Facet 2: National Development Governance: This aspect of democracy describes the governance concerned with the proportionality and balancing of the different societal functions for the purpose of desired societal development.
Facet 3: National Coherence Governance: This aspect of democracy is concerned with ensuring that society is an integrated and coherent whole.
Facet 4: National Relationship Governance: This aspect of democracy is concerned with governing the relationship between society and its members and between society and other nations, trans-national organisations and the planet.
Distinctions between the proposed W/Holistic Participatory Democracy model and the current Representative Democracy model are highlighted throughout the paper.

There are systems and systems....

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2023 RGTS: Research towards General Theories of Systems

Abstract:
This paper provides an overview of Biomatrix Theory, which is a meta-systems theory that incorporates key concepts of other systems approaches and – due to unique conceptual contributions – integrates them into a coherent and internally consistent theoretical model.
The theory distinguishes between different types of systems, namely the Biomatrix, activity systems, entity systems and systemic issues /problems. It outlines how these systems are organised in time and space and discusses generic principles of system organisation and change, including the distinction between a physical and information reality of systems.
Throughout the paper, references are made to practical methodological applications of the theoretical concepts and professional experiences are shared.

Being human in an IT environment

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
In this paper different perspectives of humans living in an Information technology (IT) environment will be reflected upon. Rapid change and emergence, complexity of systems, failed and challenged information systems, information and computer (in)security, lack of awareness and training (inter alia), all have an impact on being human in an IT environment. The problem statement that will be investigated is: ”there is a lack of coherent knowledge of what is impacting the human living in the IT environment”. Humans manage their situation within the IT environment in silo’s and from their own perspectives. This topic is also being studied and addressed in a narrow way, from own contexts. Rapid change within IT systems/software and platforms are not adequately adopted and incorporated by humans to understand how new/adapted systems operate and how to interact securely with it. There is thus a need is to ascertain what aspects have an influence on being human in the IT world in order to understand it and interact with it in a safe, holistic manner. The research methodology will be a critical systems thinking approach, where holism and emergence is of importance. The method applied will be a critical reflection of the aspects impacting the human living in the IT environment from different perspectives. Kant asked the three questions about reason: “What can I know?” “What must I do?” and “What may I hope? These questions will lead this reflective paper considering different perspectives when addressing the problem statement. The “what can I know” question will focus on several IT related issues such as information systems failures and challenges and the possible reasons of this, information security awareness, educational efforts to improve knowledge and skills when interacting with (using and developing) IT systems, and how to understand and incorporate the emergence and rapid change in the IT environment. The “what must I do” question will concentrate on the human’s role, e.g., as researcher, subject chair, software developer, engaging in professional societies etc. The “what may I hope” question will focus on how to bring about a better future for humans to cope and to be living in the IT environment, based on my insight and actions (know and do). This is the rationale of this paper.

Reflections on the information technology honours programme using a systems approach

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2023 DES: Designing Educational Systems

Abstract:
In the South-African context, most universities offer a three-year undergraduate degree followed by a further year of study to obtain an honours degree. Programmes in computing, such as information technology and other programmes with computer science majors (collectively IT), follow this same format. The high demand from students and constrained institutional resources for this further year of study, necessitates the implementation of a student selection process, all the while being mindful of, among others, the expectations of students, the industry's demand for graduates, and the university's own academic requirements and financial constraints. There is also a rapid changing IT environment that all role-players need to be cognizant off. This results in different perspectives on the honours programme, and the handling thereof. This complexity, therefore, demands a critical reflection on the honours programme from different stakeholder perspectives in order to identify different problems and pressures. The problem to be addressed in this research is therefore; how to effectively manage the IT honours programme and training lifecycle. Subsequently, the aim of this paper is to present a systematic reflection to diagnose the problems and lessons learnt with IT honours students' training lifecycle, based on the methodology of Churchman' systems approach: A problem can be referenced to in terms of its objectives, sub-systems or elements, environment, resources, and management or coordination of all these. Results anticipated from this study is the identification of the problems and lessons learnt within the IT Honours programme as well as the environment in which it functions. This is to be followed up with action research to do further reflective practice to improve the recognised problems. This will be done by examining the programme from several perspectives.

Feedback, Closure, Eigenbehavior and Analog Computing

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2023 CYB: Cybernetics and Systems

Abstract:
This paper describes the roots of feedback and several related systems and cybernetics concepts in the analog computing paradigm. Analog computing, a computing paradigm alongside digital and quantum computing, is experiencing a comeback due to its conceptual proximity to neural-network-based AI, its potential to sustain growth in computational power as digital computing is approaching the limits of Moore's Law, as well as due to its potentials with regards to energy efficiency and cybersecurity. The dominant application area of analog computing is the simulation of dynamical systems based on the solution of differential equations. This, in turn, is based on a feedback technique first described by James Thompson in 1876 in the UK, then implemented in Vannevar Bush's Differential Analyzer around 1930 at MIT, followed by an unsuccessful attempt at a first electronic implementation by Norbert Wiener around 1935 at Tsinghua University in China. After World War II, electronic analog computing became the dominant computing approach until the digital computing paradigm supplanted it in the 1970s. Feedback, along with systemic closure and Eigenbehavior, is a central concept in cybernetics. It is applied and harnessed in first-order cybernetic control systems and drawn upon in second-order cybernetic narratives on self-organization and identity. However, the roots of these concepts in early analog computing have been largely forgotten today. The proposed paper aims to revive an awareness of these origins and of the potential of analog computing in contemporary systems and cybernetics discourse. Itwill explicate the cybernetic understanding of feedback and related concepts in their historical context and in relation to their origin in analog computing, and describe the implementation of a dynamical systems model based on an educational analog computer recently co-designed by the author.

GDP as a Measure of Entropy Production of the Nation-State

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2023 GSML: General Systems Mathematics and Languaging

Abstract:
The Measure of Gross Domestic Product (GDP) in the System of Accounts for Global Entropy Production (SAGE-P) Gross Domestic Product (GDP) are values conserved-in-exchange (or prices) of all the final goods and services produced per annum by the Nation. The I/O matrix of market-value GDP assumes a symmetric translation (or mapping) → I/O matrix of the Material-Energy Balance Statistical System, (MEBSS).The paper applies the Second Law of Thermodynamics to GDP. SAGE-P assumes a three-dimensional accounting structure of economic, social and ecological values mapped on any well-defined I/O algorithm of (material) production → neg-entropy and consumption → entropy. The 'balance sheet' assumes the measure of the quantities and qualities (health, integrity and resilience) of economic, social, human and natural capital. The latter are redefined in terms of the Low Entropy Fund (LEF) available for human consumption, (Georgescu- Roegen,1971). This paper describes the statistical method, with a special focus of algorithms for mining 'Big Data' and the conceptual potential for restructuring the System of National Accounts, (SNA) to be consistent with the Second Law of thermodynamics. Government Policies of Climate Change, among other emergent issues of the Digital Age, are framed in the measure of economic growth in GDP. De-growth of GDP is seen by many experts, as a necessary condition for transition to net-zero greenhouse gas emission and towards a green economy. At the same time, higher incomes (work) are seen as a trade-off for leisure and self-actualization. The trade-off in Policies measured against de-growth in GDP is illusionary. The proper focus of transitions Policies toward the so-called Green Economy, is found in entropy efficiencies measures of (a) consumption, (b) production and (a) capital. This may be formulated as a policy objective: (a) Decrease to a minimum any socially acceptable rate of entropy production per unit of consumption, (i.e., values conserved in use and/or participation); (b) increase to a maximum any economically acceptable rate of neg-entropy production per unit of production, (i.e., values conserved in exchange and/or prices); (c) maintain the Low Entropy Fund available for human consumption at sustainable rate of entropy production. GDP is expressed as a (linear) measure of the annual production of the (final) goods and services produced in the Domestic Economy measured at market prices. It is a gross value insofar as it does not subtract from GDP the annual rate of depreciation of the Nation's stock of Economic, Social, Human and Natural Capital upon which GDP is a fully dependent variable. The accounts are constructed from the following identities: (a) Production, P ≡ Y (Income), (i.e., payments for work and/or dividend/ rent), (b) Consumption, C ≡ E, (Expenditure), (i.e., payments for goods and services), (c) Capital, K ≡ S (Saving), and (d) Trade with the rest-of-the World, T ≡ X (Exports) - M (Imports)

≡ deficit/surplus in the balance-of-trade. Materials and energy balances are accounting tables that provide information on the material input into an 1 economy delivered by the natural environment, the transformation and use of that input in economic processes (extraction, conversion, manufacturing, consumption) and its return to the natural environment as residuals (wastes). The accounting concepts involved are founded on the First Law of Thermodynamics, which states that matter (mass/ energy) is neither created nor destroyed by any physical process. (Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997). The SAGE-P enables any well-defined objects and/or functions of the GDP to be translated in the language of 'thermodynamics' expressed as equivalences (i.e., symmetries) of entropy production. Thus, production (P), consumption (C) and capital accumulation (K) are reformulated into the statistics of: (a) neg-entropy production, (Pe), (b) entropy production, (Ce) and (c) net-value of entropy production, (Pe - Ce = Ke), where Ke ≡ Low Entropy Fund [LEF] available for human consumption at any instant in time (t). Trade with the rest-of-the-world assumes the flow across the boundary of the the nested topological domain spaces (TDS): (A) Ecosphere, [(B) Sociosphere, {(C) Econosphere]} where export Xe = outflow and import Me = inflow of entropy production. The outflow of entropy production (e.g., waste residuals) of the (material) GDP are mapped to the TDS of A → as values conserved-in-themselves, (i.e., existential), the TDS of B → as values conserved-in-use, (i.e., participation) and TDS of C → as values conserved-in-exchange, (i.e.,prices). Page of 2 3 Wednesday, May 31, 2023 The value mapping is reversed for the inflow of LEF into the GDP. LEF may be assessed in both time and space in the following state-conditions: (i) Surplus-state = Pe/Ce > 1, (ii) Deficit-state = Pe/Ce < 1, and (iii) Steady-state = Pe/Ce = 1. The assessment of sustainable GDP are the anticipatory models of the future state conditions of the LEF of the Nation available for human consumption. This may be further reduced to projections of surplus, deficit or steady state condition of: (a) primary production (i.e., harvesting/extraction), (b) secondary production, (i.e., manufacturing) and (c) tertiary production, (i.e., services). The policy objective is to reduce to an absolute minimum the rate of entropy production per unit of consumption given: (a) the current, and future, state of technology, (b) the minimum socially acceptable rate of entropy and (c) limits of the Ecosphere to the material-energy engendered by GDP.

Prologue: Introduction to SAGE-P

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2023 SESD: Socio-Ecological Systems & Design

Abstract:
The object of this Paper is to introduce to the skeptics of the ISSS that the Second Law of thermodynamics, a,k.a. “Entropy,” assumes a precise, universal, and powerful metric to measure the rate of entropy production in the Material World, from the Planet Earth to the Household, OIKOΣ.
The mathematical form is the linear Accounting Matrix where the rows represent ‘objects’ and the columns represent ‘functions’ as per G-R Flow-Fund Model. Each Flow-Fund Matrix is unique to its well-defined category, but common to the matrix vector mapping, , a.k,a. as Conceptual Mathematics. The Eigen value, a.k.a the characteristic of the matrix, assumes the diagonal row connecting all matrix cells, a.k.a. data. The most familiar, and powerful, Eigen-value of the Nation-state is the monetary-value of the GDP. This number, divided the population, is the measure of the “Wealth of Nations’ ranked by the per capita income.
The System of Accounts for Global Entropy Production a.k.a SAGE-P will be introduced as an accounting metric of the (Material) Production Function = Neg-entropy, (Material) Consumption Function = Entropy, and a redefined measure of (Material) Capital = “Low Entropy Fund,” (LEF) available for human consumption. The LEF, while measured as a quantity, such as volume, weight and numbers, is valued by its qualities, such as exchange-value or prices in the economic domain referred to as the Econosphere, use-value and/or participation in the socio-demographic domain, referred to as the Sociosphere, and cultural existential value and/or intrinsic to the ecological function, referred to as the Ecosphere.
While functions change with respect to the analytical domain, objects remain the same irrespective of function, a rose, is a rose, is a rose. This distinction is important for conservation policies in general, and in particular defining the standards of efficiencies of material/energy inputs, (i.e., consumption) and material/energy outputs, (i.e., production).
SAGE-P provides a precise, and unambiguous, metric to enable policies which reduce to a minimum: (a) social-acceptable rate of entropy production per unit of product consumed and to a maximum: (b) economic-acceptable rate entropy efficiency per unit of product produced.
The reduction of entropy production per capita of each nation, province or municipality are time-scaled and qualified by cultural values -the essence of Climate-change Policy reduced to conserving where feasible, and possible, the integrity and health of the Planet-Earth’s Ecosphere.

Systemocracy: Transcending Bureaucracy via the 30/30 RoundTable

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2023 DES: Designing Educational Systems

Abstract:
Our current model worldwide for large organizations is bureaucracy, a wonderful invention in its time to correct flaws of patriarchy. Patriarchial leaders controlled the personal and work lives of their people; Bureaucracy applied only to employees' work lives. Bureaucracy, like patriarchy, is illustrated in this paper by an organization chart with arrows pointing down to represent the boss' control over employees—(i. e., top-down information flows). However, a main flaw in bureaucracy is its (perhaps unintended) treatment of employees as empty vessels to fill, leaving people at the bottom of the organization chart discontent and underperforming. Ever-increasing remedies are offered, but they are typically asystemic--that is: ill-conceived and ill-designed. Such remedies leave employees more discouraged and overworked. The 30/30 RoundTable provides satisfying new information flows without increasing employee workloads. In just 30 minutes monthly, everyone in the room (system) about 30+n people, has an equal turn to share their thoughts. The methods used to develop this topic include: non-specialist language to bypass increased workloads and the silo effect; simple and clear explanations, definitions, illustrations, metaphors, charts, and visual clarifications of key concepts--especially, bureaucracy, systemocracy, and 30/30 RoundTables; and links to experts in this and other relevant fields. The proposed result is a new structure with three established continuing information flows. The existing top-down flows (bureaucratic) are supplemented both with horizontal information flows, where employees hear each other's thoughts, and with bottom-up flows, where managers hear what their supervised are thinking. Thus, power, authority and information is gradually relocated from the top (CEO's bureau) to each level and each department (system, sub-system, suprasystem) at each company's own rate and time-frame. And, bureaucracy evolves into systemocracy.

Attending Responding Becoming: the fruits of a living~learning inquiry

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2023 SIEL: Systemic Innovation, Engagement, and Leadership

Abstract:
Traditional science paradigms dominate the academy and emphasise – if not expect – third person accounts, effectively marginalising the validity of personal knowing. Some systems thinking, cybernetics, systemic interventions and complexity approaches recognise the flaws in obviating the subjective-empirical dimension, yet virtually none offer ways to fully leverage it.
In my doctoral research, I took on an ambitious challenge to explore what it might mean, in theory and practice, to re-incorporate personal knowing alongside second and third person sources; and to do so by embracing and embodying the complexity I was experiencing in and as a 'complex living system'. This called on me to surrender to 'not knowing' and to let this be my guide.
Through a multi-modal approach to this workshop, I will introduce you to several key concepts arising from my research:
• Systemic Research Framework
• Presence in Action
• Symmathesic Agency
• Metalogic coherence
• Re-formulation of abduction
In the process, you will experience how the personal is always implicated everywhere we are – whether or not we are aware of it; and that, by admitting this (i.e. accepting, accepting as valid and letting in), the relevance, validity, efficacy and generativity of our individual and collective 'fruits' / responses to complex challenges can be enhanced.

Towards an integration of different perspectives in strategic planning: a critical systems heuristics approach

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
As executive manager of a university faculty, I experience a paradoxical problem in strategic planning. On the one hand it requires buy-in from employees on different levels: middle management, academic staff, support staff. Yet, a process of inclusion in strategic thinking seems to seldom bear fruit in terms of a unifying strategy supported and executed by most employees. The fact is that every employee brings their own perspective on the workplace to the table. These perspectives include the general characteristics of a modern university (source of new knowledge, production line of graduates and research outputs, business that must make a profit to justify its existence), the client base (students, parents, stakeholders, potential employers), the product delivered (content of study material, the qualities of the graduate, evaluation by the market), and the impact on society (creator of new knowledge apart from local contexts, conduit of knowledge into communities to be used by them, benefactor having a direct impact in the lives communities and individuals). Not all employees may even have opinions on all of these and other issues, and may even feel that strategic planning is the responsibility of management. This paper explores the possibility of arriving at a deeper understanding of the strategic complexity in a university faculty through an integrated approach to the problem using critical systems heuristics as a theoretical framework, focussing on two key aspects namely the incorporation of different perspectives and emancipation.

A PAR approach to environmental justice competencies and systems thinking in pre-service teacher education

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2023 DEI: Diversity Equity Inclusion

Abstract:
We want to explore how environmental justice competencies can be developed and promoted in Teacher Education curricula at North-West University. The “Environmental Management for Sustainability” module (EDTM 312) which is compulsory for all students enrolled for the BEd programmes at NWU will be used as a case study.
There is a need for HE to integrate EJ in their curricula, and one way to achieve this is through the development of competencies (Michel, 2020). A competency can be understood as “a complex combination of knowledge, skills, understanding, values, attitudes and desire which lead to effective, embodied human action in the world, in a particular domain” (Crick, 2008: 313). Education for Sustainable Development (ESD) has the potential to offer approaches that can be useful in the development of EJ competencies. The most widely cited competencies for sustainability are systems thinking, anticipatory futures thinking, normative values thinking, strategic thinking, and interpersonal (collaborative) competence (Wiek et al., 2016; Michel 2020). The results of this research will be useful in informing how we can re-orientate the EDTM 312 curriculum to include an environmental justice focus.

What is the impact of Feminist Narrative Research (FNR) on Participatory Systems Mapping (PSM) practitioner reflexivity within a health policy context for more meaningful engagement?

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2023 DEI: Diversity Equity Inclusion

Abstract:
This paper focuses on the ways that systems practitioners have 'meaningful' engagement and impact (see Midgley et al, 2018) using participatory systems mapping practices (see Barbrook-Johnson and Penn, 2022) in messy public policy contexts. Many of the knowledge gaps reported by systems practitioners are issues at the heart of 'feminist' methodologies research (such as key gaps around how to better engage with issues of gender, exclusion, elite power capture and lack of intersectionality). Yet few systems thinking studies explicitly investigate how feminist research techniques can be used in practice. We propose practical ways for integrating feminist narrative research into PSM practitioner reflexivity and report on the impact of their use in an East African health policy research project. The rationale for this work was a call to action in a 2018 European Journal of Operational Research Special Issue on Community Operational Research (OR). The editors (Johnson, Midgely and Chichirau) argued that despite the valuable, extant contributions of participatory systems thinking studies in multi-stakeholder public policy contexts, critical knowledge gaps persist around knowing what practical process design choices lead to sufficient engagement with the questions that are 'meaningful' to 'client' communities. We were motivated to explore practical options that adapt systems practice to reduce these knowledge gaps. Our applied methodology is split across two parts. First, a literature review informs the formulation of a set of 'methodological requirements' to be resolved for more 'meaningful systems practice'. We then make a set of epistemological and axiological arguments for the suitability of feminist methodologies to enhance participatory systems analysis in practice. A second part evaluates our resultant experimenting with feminist narrative research (storytelling), integration of situated knowledge, and practitioner guidance for self-reflexivity on a 'Innovation for Cancer Care in Africa' (ICCA) project in Kenya and Tanzania 2020-2022 (https://www.open.ac.uk/researchprojects/innovation-cancer-care-africa/). We conclude with study limitations and further work.

Governing river catchment governing: the case of the Olifants, South Africa

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2023 SCA: Systems Change in Africa

Abstract:
Globally there is widespread systemic failure of river catchment governing. Why is this the case? The answer is of course that very few professionals involved in river governing approach what they have to do, or what needs to be done, cybersystemically. The issue is best understood or framed as a classic 'wicked problem' in which one element is framing failure itself. Governance is rarely framed and enacted cybersystemically. Drawing on his extensive river catchment governance research in a wide range of countries Ray will explore in detail his experiences in South Africa with the RESILIM-O project based in the Olifants catchment, one of South Africa's biggest rivers which also runs through Kruger Park.

Game-based learning to improve critical thinking and knowledge sharing

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
This paper investigates how game-based learning promotes critical thinking and contributes to shared knowledge by learning through play.
Learning approaches have a significant impact on learner interest in corporate training. When both children in school and adults in their workplaces fail to sustain the essential drive to complete a given training, they become disappointed. The foundations of game-based learning philosophy are safe practice, experiential learning, and interaction. Learning through games allows players to experiment in non-threatening circumstances and gain knowledge through practice and social engagement with their peers and the surroundings. In addition to experience learning and engagement, game-based learning presents circumstances that necessitate contemplation and decision making on the part of the learner in order to solve an issue. In this manner, the person gains knowledge and concepts while developing cognitive talents resulting from critical thinking, reality analysis, and dispute resolution. The principle of game-based learning entails a novel method of teaching company employees and information exchange.
This paper contends that in order to grow and develop emotionally and professionally, we must all learn new skills and broaden our knowledge.
Learning approaches have a significant impact on learner interest in corporate training. When both children in school and adults in their workplaces fail to sustain the essential drive to complete a given training, they become disappointed. The foundations of game-based learning philosophy are safe practice, experiential learning, and interaction. Learning through games allows players to experiment in non-threatening circumstances and gain knowledge through practice and social engagement with their peers and the surroundings. In addition to experience learning and engagement, game-based learning presents circumstances that necessitate contemplation and decision making on the part of the learner in order to solve an issue. In this manner, the person gains knowledge and concepts while developing cognitive talents resulting from critical thinking, reality analysis, and dispute resolution. The principle of game-based learning entails a novel method of teaching company employees and information exchange.
This paper contends that in order to grow and develop emotionally and professionally, we must all learn new skills and broaden our knowledge.

Digital phrenology: Algorithms and ethics from a systems perspective

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2023 RHT: Reintegrating Humans and Technologies: Industry 5.0

Abstract:
Decisions made by machine learning algorithms have societal impacts, both good and bad. This study acknowledges the great amount of good that machine leaning algorithms contribute to society while also pointing out that there are negative im-pacts such as bias, discrimination and misrepresentation of data, etc. Algorithms often use either irrelevant or incomplete data to make life changing determinations about certain groups of society. The algorithmic use of data that does not represent the true or actual ability of individuals or groups of people leads to digital phrenology. When algorithms are designed and tested outside of the real world, it may not be obvious that digital phrenology may be caused. The ethical consequences of this problem can be mitigated if algorithms are not viewed as separate from the world it is eventually deployed into. Therefore, a more holistic systems view of algorithms, including its ethical consequences, should be taken. The purpose of this paper is to show that digital phrenology exists and that, once deployed, algorithms become part of a societal system where ethical values cannot be ignored. Various efforts and approaches to mitigate the ethical concerns related to unethical algorithmic behaviour have either done well in raising awareness or produced promising results. However, very little attention has been given to the explicit use of ethical theories as a possible solution to the problem. Therefore, two major ethical theories are proposed to assess the ethicality of hypothetical machine learning scenarios. A critical analysis of related literature and case studies are central in the method of inquiry for this study. Results shows the existence of digital phrenology. It also reveals how viewing algorithms, as a single component of a larger societal system, can give better perspective to the possible ethical consequences that arise from its use. This research contends that the use of ethical theories can contribute to addressing digital phrenology, through viewing algorithms as one of many components in a larger system.

A critical discussion regarding the feasibility of rendering Structured Democratic Dialogue virtual

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
The paper examines the impact of virtual rendering on the Structured Democratic Dialogue (SDD) process. The authors evaluate the implications of making each process stage virtual and suggest necessary adaptations to the relevant practices. They also provide recommendations for improving the quality of online sessions and propose qualitative and quantitative indicators that can be used to compare and evaluate both face-to-face (f2f) and virtual implementations. These indicators include completion time, resource cost, number of ideas generated, Spreaththink, quality of discussions, number of clusters, number of factors included in the influence map, number of connections in the influence tree, degree of agreement on moving forward, and various complexity indices. Several hybrid- and totally-virtual applications are presented and discussed. The authors conclude that further research based on actual case studies is required to develop and agree on criteria and metrics for assessing the possible quality loss associated with rendering a process virtual.

The role of systems science and cybernetics in transforming contemporary governance

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2023 CYB: Cybernetics and Systems

Abstract:
This paper argues that the decline of democratic institutions and governance can be attributed, in part, to the neglect or violation of fundamental principles of cybernetics and systems science. The authors examine the current application of these disciplines in governance and provide a comprehensive overview of democracy, tracing its origins back to ancient Athens. They propose three essential principles for effective governance: (i) a clear purpose and direction with strict adherence, (ii) efficient steering and feedback mechanisms, and (iii) consideration of higher-order cybernetics. To assess the implementation or disregard of these principles, the authors analyze case studies where systems science has been applied to governance. The paper emphasizes the need for policymakers and social scientists to identify, acknowledge, and rectify violations of these principles and laws. Furthermore, the authors call for systems scientists and cyberneticians to educate those responsible for governing societal systems on these crucial concepts and principles. Ultimately, the paper concludes by offering recommendations for corrective actions, urging policymakers and social scientists to recognize the paramount importance of applying cybernetics and systems science principles in governance to achieve effective and sustainable outcomes.

Why participatory systems methods fail and are inappropriate for complex system problems: The 2 Feedback Loop Axiom

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2023 SMSE: Systems Modelling and Systems Engineering

Abstract:
It is widely assumed in Systems disciplines and professional practices that there are no intrinsic limits on individuals' mental abilities to address complex systems problems. This paper identifies an explicit biologically-based cognitive bound on individuals' abilities to mentally predict system behaviours and outcomes. It identifies this bound is when systems behaviour is shaped by two or more feedback loops. The author also reports the existence of a widely held delusion that such a bound does not exist and regardless of the evidence otherwise, systems professionals and others falsely claim to be able to understand and predict behavious and outcomes of such systems. As part of the analysis, the paper draws attention to the central and essential role of prediction in addressing system problems, understanding system behaviour and managing complex systems situations. Significant implications of this 2 feedback loop limitation impact several assumptions of systems theories and practices. Firstly, because individuals are mentally unable to correctly predict systems behaviours when they derive from 2 or more feedback loops this means it is obviously, of no advantage to ask multiple people; who are all incapable of prediction beyond this 2 fedback loop boundary. Hence, this defines a boundary on the validity of participatory and consultative systems methods, because such methods are obviously invalid beyond the 2 feedback loop boundary.Additionally, for the above reason, two feedback loop boundary provides a new and improved definition of complex system and the difference between complex and complicated systems.

Variety Dynamics: A new body of systems methods and theories for ownership and control of complex and hyper complex systems and their outcomes

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2023 SACD: Systemic Approaches to Crises and Disasters

Abstract:
Current systems methods are inadequate to address and manage complex multi-actor dynamically-changing systems. They attempt to do so by: reducing explanation into merely complicated systems; mathematical mechanical modelling of causes and effects; or attempting to guess outcomes of decisions using particpatory methods. They are ineffective for complex systems with the following characteristics: multiple changing system and subsystem ownerships with purposes, perspectives and motivations that change dynamically and relatively unpredictably; a variety of continually-changing power and control approaches across systems and subsystems that also reflexively influence the system environment; system structure, subsystems and their purposes and boundaries changing dynamically; parts of the system and subsystems existing outside the system boundary; multiple dynamically-changing feedback loop relationships between subsystems, environment, system and control actors; external environment changing and influencing a wide variety of factors, actors, purposes, system resources, system and subsystem behaviours and abilities; a large proportion of subsystems and system characteristics are unknown and dynamically changing in ways that with other dynamic factors influence system behaviour.
There are many examples of such systems in e.g. management of epidemics, energy infrastructure, environmental issues, economic competition, IT development, politics, war, etc. Existing systems methods are not only ineffective at managing systems involving such dynamics and complexity, they provide little or no guidance to managers or those attempting control of such systems.
Variety Dynamics is a new systems approach and suite of methods, and new field of mathematics specifically tailored to managing the dynamics of power and control in these kinds of systems. It also offers a new suite of tools for managers to understand and predict the bahviours of such highly-complex systems whilst avoiding the 2 feedback loop cognitive limitaitons of causal thinking. Variety Dynamics to date now contains over 30 axioms. The presentation providse practical examples of Variety Dyamics in systems contexts.

Literature and Social Change – Pedagogies of (Re)Orientation in Voluntourism Reading Groups through uMunthu in Rural Malawi

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2023 SCA: Systems Change in Africa

Abstract:
Can literature bring about social change? Is a 'literary voluntourist' possible? My research focuses on volunteer tourism in rural Malawi where I have hosted several reading groups with volunteers to re-orientate and counter-narratives of white saviours that perpetuate the idea of an exotic 'other'. Specific postcolonial texts, such as NoViolet Bulawayo We Need New Names, use particular literary techniques (intertextuality, identification, decentring, projection) to reflect the voluntourist into their own mirrors and consider to what extent 'the other' also touches the 'others' within ourselves. Introducing literary methods for social reform, particularly within the neo-colonial structure of Malawi's volunteer tourism economy, brings a specific set of complications. As such, the classroom is as important as the text. Bringing several pedagogical methods together, I tried to develop a more holistic and embodied reading group programme that aimed to create a greater critical awareness of the volunteers' lived experience of Malawi. This provided a testbed for the 'literary voluntourist' I am seeking, both in them and in myself, in the pursuit of better training for this complex form of travel. In this paper, I reflect on how I created the pedagogical framework through action research, using an earlier experimental reading group of The Boy Who Harnessed the Wind by William Kamkwamba and Bryan Mealer. This reading group did not provide the desired results, with over-confident volunteers. In a renewed focus on pedagogy, I think about how a 'system' can be created that challenges the idea that knowledge is synonymous with (neo-colonial) power, and instead focuses on uMunthu (I am, because you are) as a grounding principle already present within the Malawian environment.

Spoiler Alert: The Wizard of Oz is a fraud

MacGill, VRD, The Science of Connecting, NZ

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2023 BIC: Balancing Individualism and Collectivism

Abstract:
We all have a sense of ourselves as having a self that abides through time, but closer explorations reveals that the self is not as straight forward as it might appear. The nature of the self has been discussed since the ancient Greeks and earlier. Systems provides an alternative lense viewing the self as a multi layered, recursively interacting, autopoietic system with internal and external aspects. While the self can be seen as a single coherent unity, it can equally be understood as the interactions of subsystems and supersystems. Henriques' Unified Theory of Knowledge is used to frame the our levels of evolutionary development through matter, life, mind (emotion and thinking), and culture. As languaging beings, our shared culture has an enormous impact on our sense of self, in helpful ways and unhelpful ways. Any errors or distortion are reflected fractally through our whole being, impacting on the sense of self. This paper also links to Holling's Adaptive Cycle and Campbell's Hero's Journey. The story of the Wizard of Oz is not merely a children's story, but is a mapping of a human being and their journey of development through life. The story of the Wizard of Oz is used to explore that nature of self with Dorothy representing an individual, such as you or I, facing life challenges. Aspects of Dorothy's psyche are represented in other story characters. For example, the scarecrow is her mind, the tin man her emotions, the lion her courage, and the wicked witch her shadow. Dororthy finds the socially constructed self she has clung to all her life to be a fake as the Wizard of Oz's true nature is revealed. But that is not the end of the story …

System Thinking meets Data Science/Engineering

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2023 DES: Designing Educational Systems

Abstract:
In the advent of data 3.0 and analytics 3.0, system thinkers are at the position to provide a bigger picture in data science and data engineering. In the data life cycle, a system thinking approach emphasize that decision making patterns emerge from a data life cycle to create data driven systems and decisions. System thinkers meet data practitioners to provide a bigger picture data driven decision making. This paper uses explanatory research and system thinking approach to look at the role of system thinking skill in data driven decision making. It also answers a question of why system thinking skill is relevant to data scientists' or engineers' career using empirical data collected through questionnaires from a group of data scientist and engineers working for government and its parastatals . The research shows that the skills of system thinking in data life cycle are important and needs to be every data scientists or engineer needs to embrace the such skills. Secondly, it shows that majority of data scientists and engineers agree with a fact that a Systems Thinker approaches problem-solving by viewing the problems as part of a wider, data resourced and dynamic system and Data Practitioner supports the data life cycle by collecting, transforming, and analyzing data, and communicating results in order to inform and guide decision-making. In this regard, in system skills emerges one of the great component of skills needed by a data scientist or data engineer. The latter ascertains the position of a system thinker in any industrial revolution (i.e. industry 4.0. and industry 5.0).

Social justice to learning computer programming: A critical systems thinking approach in computing education at a university

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
Numerous kinds of literature consulted in programming education emphasize that learning programming is hard.There are several reasons provided for this difficulty. This includes subject complexity, student culture, technologyintegration, and institutional infrastructure. Several tools are proposed in the literature to remedy this situation, butthe problem seems as if it continues to persist. This study is therefore grounded on the notion of alleviating theseproblems through a critical systemic approach. Critical systems heuristics (CSH) was applied in this participativeaction research study as an invention tool, to unearth the taken-for-granted issues that limit programming educationand ultimately emancipate the affected/involved in systemic terms.The utilization of the CSH permitted the researcher to apply a critical multi-methodology where severalinterpretative data collection and analysis methods were employed. Some of the data collection methods usedinclude dairies, documents, and semi-structured interviews, while analysis includes cross-case, content, andcollaborative.A purposive sampling technique was employed to decide on the contributors of the study, who were the computingteacher trainees, and experts such as the critical systems heuristic, human-computer interaction, Computer Sciencelecturer(s), curriculum developers, and researcher(s). The computing teacher trainees, collaborated with the initialdata, while the experts contributed to theory in form of validation and provision of new insights, that wereoverlooked by the computer teacher trainees.Some of the results of the study indicate that a more comprehensive stakeholder social contract is needed to remedythese problems. It was also observed that student profiling plays a significant role in computing learning and ifconsidered would empower the computer instructor to accommodate student uniqueness. On the other hand, learnerautonomy was considered critical as it empowers the student to take ownership, risk, continue learning, and critique learning.

The do's of learning programming: a critical review of the suitable assessment strategies for the programming students

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2023 DES: Designing Educational Systems

Abstract:
Assessment is regarded as a vital tool in teaching/learning, especially in programming as it benefits learners/teachers. However, concerns are raised about the assessment of the current millennium students, with reference to its strategies as the focus has been on what is easy to measure than what needs to be measured. This concern is exacerbated by the emergence of the current coronavirus epidemic. This is argued to have compromised authentic learning. Authentic learning's emphasizes is on complex real-world problems and their resolutions which are obtained through virtual communities, case studies, role-playing, and problem-based practices (Lombardi and Oblinger, 2007:2). In this study, it is argued that the consideration of what needs to be measured demands the consideration of the complex environment in which the current computer training is classified.
A multi-methodology approach, through the critical social research paradigm, was applied in this study to critique, appreciate and act on the problem situation, from a contextual socio-ecological viewpoint. Ulrich's (1983) critical heuristics (CSH), guided by Checkland and Holwell's (1998:13) organised use of rational thought framework (FMA), was applied to this participative action research (PAR) study, to unearth taken-for-granted/hidden assumptions, through criticizing, acting, and reflecting upon them. This PAR was performed as per Susman et al.'s (1978:588/ASQ) adapted action research practice.
Data in this PAR was obtained during a cyclic reflective style of data collection and analysis processes, which were applied to inform each other and complement the above-mentioned approaches (i.e., the CSH and FMA). These include diaries, source documents, group and individual interviews, as interpretative data collection methods, inclusive of content, cross-case, and collaborative analysis, as interpretative data analysis methods. Through the mentioned approaches/methods, the perceptions, and practices of a group of computer teacher trainees and some experts, who were purposively sampled, were critiqued to obtain rich learnings. The trainees were used as principal participants, while experts were utilised in validating the obtained theory.
The study's findings indicate that the assessments should always be contextually sensitive with regard to the concerned parties' framework (F), methodology (M), and area of concern (A). The F of the study was asserted to be that of the critical systems thinking, while the methodology was contended to be the CSH and connectivism. The area of concern was on providing recommendations for assessment. The value of context in terms of A, was argued to enhance a continuous reflection of theory by practice and vice versa,

in assessment, thereby cultivating a conducive environment for flexibility and authentic learning in programming. Some of the observed contextual issues include coding skills such as design, debug, test, and documentation, inclusive of other originally unintended capabilities like explanation, managing and networking.

These contextual issues, it was argued can be achieved through the application of various assessment strategies, which include outcome predictions, labelling a provided diagram, Parsons problems, subgoal labelling, debug/fix, matching and ranking, trace execution, finish/extend a current program, code reviews, order/values, and behaviour prediction. It emphasised that these should be applied for diversity, authentic assessment, and ultimately learning. These strategies were argued to be applicable through various means, which include inductive teaching, student centred, or interactive inclined methods, which were advised to be critiqued, and enriched, continuously in terms of FMA.

How might a systems approach invite the change or hope "it" wishes to see? A story of an action research journey so far to advance the "system" with mothers in addiction recovery in Ireland

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2023 DEI: Diversity Equity Inclusion

Abstract:
Buckminster Fuller said 'to change something, build a new model that makes the existing model obsolete.' Do we imagine a new model as a product at the end of our research or engagement? Or do we imagine it being our research or engagement process itself? Deeply attuning to each moment and the creation of conditions that may welcome new possible system(s) or the noticing of hidden potential in the system which invites different ways of orienting. Noticing that in defining research, selecting participants, framing an approach and questions, we are creating a stage for 'reflections, dialogues and opportunities for new configurations in the system'. Maybe our research or engagement could also be related to as a story that is being brought to life while embodying a 'relational responsibility'. We write the story as we act "it".
This is an invitation to share in a story of an action research journey so far to advance the "system" with mothers in addiction recovery. "Advance" doesn't mean change by force rather central to this is a deep wish that mothers and their families are at the heart of any system they are connected to. While simultaneously 'growing a shared understanding' of what that might mean for them and how it might be similar or different from what is their current experience. It is hoped that this could welcome a system of support that is attuned to the experiences, hopes and dreams of mothers in addiction recovery and their families and which 'recognises and realises' their wisdom. How is the process being created to try embody this and what has happened in the journey to date? Join me in a reflexive conversation to hear the story so far in this action research project.

Story telling to foster emotional intelligence , leadership and multispecies relationships

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2023 BIC: Balancing Individualism and Collectivism

Abstract:
The paper addresses a multispecies systemic approach to uniting indigenous knowledge systems with earth jurisprudence and wild law using a systemic approach to storytelling and a range of mixed methods to develop rapport and relationships with participants who are members of an ongoing community of practice. The focus of this paper is on process and the space we have co-created through relationality. Our members pool diverse ways of knowing and being to focus on social, economic and environmental praxis to support multiple species. Ontologically and epistemologically we apply co-leaning to our praxis, and axiologically we assume that all transformative interventions should enhance fairness, transparency, and accountability as a basis for our case studies on risk reduction and the enhancement of wellbeing. The problem we are exploring in a forthcoming volume is whether pilot projects that put in place the principles of earth jurisprudence and organic farming (in partnership with members of PGS and the Wild Law institute) can make a difference to social and environmental justice. Our multidisciplinary and cross cultural team draws on indigenous knowledge systems as well as many other ways of learning and knowing through respectful dialogue to address our area of concern. Success is bench marked in terms of establishing a co-operative, the growing number of social enterprises striving to comply with organic farming principles, tree planting, seed collections for an organic seed bank and the perceived social, economic and environmental indicators of wellbeing. Our relational methodology applies participatory action research and storytelling to draw out themes which are mapped to assess progress towards re-generative living . Turning points for the better are indicated by a revised version of the UNSDG with a focus not on growth but on creating a cyclical economy that protects people and their shared multispecies habitat. To date our community of practice has managed to grow the number of participants and partners and our next goal is to set up two seed banks, one at the coast and one inland in South Africa in two case study areas in the Cape and Limpopo. This paper reflects on the process and methodology.

A gender sensitive approach to uniting indigenous views on natural law with relational governance for protecting the commons

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2023 BIC: Balancing Individualism and Collectivism

Abstract:
The key theme of this paper is that climate change, high costs of living and movement to the cities threaten food security but this does not mean that small farmers should be threatened by the corporatisation of food production or factory farms. Localisation and food sovereignty is about owning the means of production of the food cycle and preventing the monopolisation of seed.
The paper discusses learning within nature's classroom in the Limpopo region of South Africa, through on line and face to face facilitation supported by University of South Africa, the University of Venda, Adelaide University and PGS[i] (an organic farmers network). This research aims to contribute to the literature by uniting indigenous views on natural law with earth jurisprudence and Wild Law to protect the commons and habitat for multiple species. Law is first and foremost a construct according to Peter Burdon . Firstly, we make a case for systemic principles and a systemic approach to protecting multiple co-dependent species and a shared habitat that supports living systems. Jurisprudence, rights and wild law concepts underpin the discussion which also addresses land rights, dispossession, displacement and the dangers of land claims by mining companies . Secondly, we make a contribution to the discussion on the draft policy on South Africa's Biodiversity, Conservation and Sustainable Use . Thirdly, we explore ways in which principles could be applied through education and community governance to protect living systems. Fourthly, we discuss the activities of a (growing) community of practice that supports intergenerational earning, learning and growing a future by protecting people and

the environment through social enterprises to support growing food in ways that protect and nurtures people, community and the natural environment. We are building on the established networks of the team members who are pooling our knowledge and resources. Members of the community recently reported on how much we have learned from one another already and how many enterprises they have set up and that are continuing to grow. Meanwhile we have also benefitted from the involvement of PGS (learning about organic farming and drawing also on traditional wisdom regarding this). In this way we have focused on avoiding a green washing approach which suggests that growth can be sustained or that commodifying every step of the food production process is justifiable. Sustainable Development Goal no 8 stresses Decent work and economic growth, but growth is the issue which William Rees , who coined the 'ecological footprint' warns us against (2021, 2022) when he stresses that overshoot is more than a problem associated with climate change. It is a problem linked with human-centred thinking. Vandana Shiva (2022 a,b) stresses the importance of working with young people and empowering women farmers (Shiva, 1989) so that the soil and communities remain healthy. By protecting business as usual, monocultures (Shiva 2012,2016) and destruction of small farmers through setting up agro industries that destroy multiple species – we will destroy the cycle of life which depends on photosynthesis to make oxygen out of carbon and to create the molecules of life. The commodification of seeds, the use of chemical fertilisers and the promotion of fake food will only hasten desertification through destroying the soil as stressed in the launch of 'growing life' at the International Food Summit in 2022 and at the Feminist Food Summit in 2023.

Sciencing and philosophizing on threads in systems thinking: tracing through the texture of the socio-technical and socio-ecological perspectives

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2023 RHT: Reintegrating Humans and Technologies: Industry 5.0

Abstract:
In the development of systems thinking from the 1950s through the 1990s, strands of an emerging science of systems coevolved with underlying philosophies of science. Collaborations, across the Churchman-Ackoff network in the United States, and the Trist-Emery network in the UK, were largely influenced by traditions in American pragmatism dating back to the 1890s.
Branches of philosophy of science underlie practices in action learning, and theories in the systems sciences. Over decades, progress is more explicitly recognized with verbs rather than nouns. Sciencing can be seen as an ongoing pursuit of better answers. Philosophizing can be seen as a pursuit of better questions. The two pursuits coevolve.
With the comparative philosophizing of the science of classical Chinese medicine for western audiences, Keekok Lee distinguishes the waning and waxing of yin qi and yang qi, as the intertwining of qi-in-dissipating mode and qi-in-concentrating mode. Through a post-colonial constructionist program of philosophizing Rethinking Systems Thinking, principal concepts of (i) rhythm, (ii) texture, and (ii) propensity have become the core of Systems Changes Learning practices, theory, and methods.
Causal texture theory shifted the emphasis from the system of interest to four types of change in the organizational environment. The four types of causal textures can be extended with recognition of qi-in-dissipating and qi-in-concentrating modes. The constructionist philosophy can be applied to the socio-psychological, socio-technical, and socio-ecological perspectives through a variety of contextual-dyadic combinations.
The emphasis on systems changes on the sciencing of systems prioritizes a time-space predisposition over a space-time presumption. Conversations on systems thinking accordingly inquire first on rhythmic shifts in textures, and subsequently the defining of systems and boundaries. Systems Changes Learning is a systems approach bridging Western and Chinese philosophizing.

Society 5.0: Moving from transhumanist to posthumanist technologies

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2023 RHT: Reintegrating Humans and Technologies: Industry 5.0

Abstract:
Government proposals and funding have been initiated in the EU and Japan, aimed at making technology advancements more human-centric. While important, these efforts remain more aspirational than effective. This presentation will summarize key findings from four years of research by a team funded through the EU Industry 5.0 grant. It will explore the wider implications, and some of the challenges, of moderating the advancements of Large Language Models, and other artificial intelligence systems, as they impact human societies. Philosophically, these pose challenges between transhumanist and posthumanist approaches, dating back to cybernetics.

An Autoethnography of my Nomadic Journey with Western and Indigenous Knowledges: From Social Constructionism to Systems Thinking in Leadership

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2023 DEI: Diversity Equity Inclusion

Abstract:
The purpose of this session is to discuss my autoethnography through research and practice that explores my tension and frustration with undervalued systems thinking in leadership within rural economic development aid programs from across the world. My nomadic story highlights my critical reflections, research and learnings during my experiences consulting in Paraguay, leading an aid program in Afghanistan, living with the Mayans in Guatemala and participating in Buddhist gatherings in Norway and Thailand. I have spent much of my professional and academic career struggling with the dominance and limitation of Western knowledge and have found my dissertation work and practice as a way to confront these disturbing issues and invite indigenous knowledges for new ways of being, thinking, doing, acting and becoming. I began this inquiry with a social constructionism framework guiding my work; however, my experiences and research have transformed my thinking to a systems thinking way of seeing the world in relationships rather than divisions and separate pieces. This has been an important process for me, nevertheless, it continues to be unclear and uncertain how academia and international development aid programs can escape from their often limited “expertise” and embrace a view of the world that values local, human, and non-human, knowledges.

The Application of FMA to Automation Research

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2023 AR: Action Research

Abstract:
Process automation is a field of study which is rapidly emerging due to it's rate of adoption across the world. With the rapid adoption rate, more research energy is being focused within the automation space. Due to the challenges that process automation aims to solve, the use of soft systems methodology (SSM), which focuses on understanding a problem situation, is a suitable approach to understanding the environment in which automation is being researched. Along with SSM, the Framework, Methodoly and Area (FMA) model (which helps researchers identify area of interest, methodology and framework of ideas) can be generalised enough to be used as a methodology within any automation-orientated research. The research methodology of choice for this research would be Design Science Research (DSR) aimed at understanding and evaluating the complexities of demonstrating a methodology using FMA. The iterative design cycles that are used as part of DSR are advantageous to evaluate the learnings of implementing FMA to demonstrate a research study position.

Solving 'wicked' problems in global health using systems science

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2023 HST: Health and Systems Thinking

Abstract:
A major global health challenge outlined in Sustainable Development Goal (SDG) 3, is reducing under-five mortality by 2030. Each year, 15 million babies are born too soon (preterm). Together with other small vulnerable babies, they represent the leading cause of under-five mortality. These babies have complex needs, often requiring specialist facilities, with dedicated medical, surgical and nursing care, which is often lacking in low-resource settings. The majority of the burden of preterm birth is found in sub-Saharan Africa and South Asia, where complex factors including maternal nutrition, access to quality antenatal care and safe delivery with skilled birth attendants interact to impact infant survival. Delivering equitable, affordable, safe, and high-quality health and surgical care to babies and their families, represents a 'wicked' problem. 'Wicked' problems are systemic, socio-cultural issues that are unique, inherently complex to solve, and often symptoms of wider societal issues. Innovative solutions to improve under-five mortality are needed if we are to meet SDG-3. which move beyond the need for adequately trained healthcare workers, to encompass infrastructure, financing, equipment, sterilisation and, blood supplies, medications, nursing care and efficient data collection systems. The systems engineering for patient safety (SEIPS-101) framework, represents one method of characterizing the problem of healthcare delivery for mothers and babies by recognizing the complex, adaptive nature of health systems. Adopting a human-centred approach, the framework focuses on the people at the heart of the health system, the tasks they perform, the tools they use to complete these tasks and the wider physical, socio-organizational and external (socio-economic) environment in which health systems function. It further focuses on work systems, processes and outcomes within complex, adaptive health systems. I will outline the use of SEIPS-101 in relation to addressing 'wicked' problems in global health and surgical care for mothers and babies.

Data Privacy in Smart Homes, A Critical Systems Thinking Perspective

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
With the advent of smart appliances and objects, a smart home has never been this complex. Today's homes are equipped with all kinds of smart objects capable of internet connectivity. Just a few years ago, a Home Area Network (HAN) only had personal computers and mobile devices making up the network. Today the picture is different, fridges, televisions, coffee machines, aircon, thermostats, and gate motors, just to name a few, are all now capable of communicating with each other and to the internet. This interconnectivity of various systems introduces a level of complexity to a HAN. For instance, these smart appliances and objects might be using different communication protocols, each manufacturer may implement security differently. With the lack of standardization when it comes to IoT, this complexity opens up loopholes in the security of the smart home.
By looking at a smart home as a complex system made up of sub-systems that may impact the security of the whole network, systems thinking will be a suitable approach to address this problem. Systems thinking was developed as a means to address the complexity created by the interdependency of various systems, both existing and new ones(Arnold & Wade, 2015:670).
In our previous research on data privacy in smart homes, emphasis was placed on the layered architecture of IoT devices and how each layer may impact the security of each IoT object and the network as a whole. Different methodologies were used to collect and analyze the data. In this paper, we propose addressing the data privacy issues of smart homes by looking at the problem from a systems-thinking perspective. Arnold and Wade (2015:670) mention that we can view systems thinking as a system, in a nutshell, we can think of Systems thinking as a way of a system of thinking about systems. With this perspective in mind, we can address the security problems in a smart by looking at it as a complex system. Churchman (1968:29) Defines a system as "a set of parts coordinated to accomplish a set of goals". This definition could not describe any better what a smart home is.
In this research, Critical Systems Thinking (CST) has been adopted as the preferred methodology for this research. According to Jackson (2001:233), CST was created to "allow an analysis of complex societal problems and intervention to resolve such problems". This description suits well what this research is trying to accomplish.

Designing safe virtual spaces as part of mainstream disability services using the Viable Systems Model

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2023 HST: Health and Systems Thinking

Abstract:
There was an urgent need to find alternative supports for disabled people at the start of the Covid-19 pandemic, which left services in a double-bind worldwide. Face-to-face contact was potentially life-threatening as much as isolation was potentially devastating. Disability posed a wicked problem nested within the global super-wicked problem and the UN urged countries to prioritise disabled people's needs in the recognition that they would be hardest hit.

A systemic inquiry project explored the potential of virtual services (VS) as an alternative service model by exploring how some services in Ireland set up ad-hoc Virtual Services - often despite poor digital literacy amongst staff and disabled people. Services acted as Complex Adaptive Systems, that transformed the traditional power dynamic between the giver and receiver of services, for those who were able to adapt to this model. A subsequent World Café found that staff practices played a critical role in creating safe virtual environments where meaningful connections were possible.

A final study sought to validate the characteristics of safety in virtual spaces and the staff practices that support it. It also aimed to identify the systems-wide conditions needed to create a viable service experienced as a safe space. A real-time online Delphi-style survey, was conducted with an international group of facilitators, managers and consultants. The Viable Systems Model was used to structure questions leading to the development of principles for the design of safe virtual spaces. This paper presents initial findings - for discussion- that propose a reframing of psychological safety as a systemic construct. It also identifies essential components to support operational and coordination professional practice to provide the best response in the midst of uncertainty, and key considerations for managing resources, future planning and the integration of Virtual Services into mainstream service design.

Implementation and Systems Sciences: What happens when two sciences collide

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
This presentation explores paradigmatic and conceptual tensions between a systemic approach and Implementation Science (IS) approach to public policy using examples from Irish and European policy making. Both approaches are grounded in different traditions and logic assumptions, but could arguably be seen as working towards the same end goal: bridging the gap between policy and practice. In this presentation, we will explore the extent to which both approaches are epistemologically commensurate or set on a collision course of incompatibility.
IS has come to prominence over the last decade, gaining considerable traction in fields such as health and education. It focuses on rolling out centrally conceived solutions and scaling up evidence-based practices for implementation by professionals in order to close the 'know-do-gap' between research and practice. Designing interventions is a scientific endeavour that relies on evidence usually provided by hard data. Evaluation often relies on metrics such as acceptability of the solution by the beneficiary, often with little consideration of local conditions. This is commensurate with a top-down and positivist, 'systematic' action logic regarding the provision of knowledge where evidence flows from policy-makers to practitioners charged with implementation.
More recently, Implementation Science 3.0 has begun to recognise that interventions are characterised by complexity, whilst at the same time eschewing the 'cult of the personality" as a potential contaminator of practice. It occasionally draws on systems analysis and improvement approaches (SAIA) (derived from systems engineering) - yet remains on the whole within a positivist paradigm seeking first-order change.
From a systemic perspective, it might seem that IS serves to give comfort to policy-makers and practitioners that there is solid and certain ground beneath their feet, and to reinforce institutionalised norms that sustain the institutions, by ignoring the human-beings in the system, rather than enter the swampy low-lands of professional practice, and live with the complexity of being in an uncertain world.

Are the Implementation and systems sciences on a collision course or might it be possible to harness the duality of the systematic and the systemic to develop more coherent responses to policy dilemmas? What can we do to nudge IS towards a second-order shift? What can we learn from its rigour and rapid spread?

What could soft and critical systems approaches offer to countermand the obsession with data over people as independent agents, to prompt reflexive consideration of the framing of a perceived issue? Might the systems sciences usefully caution against the reductive use of complexity sciences, for example, where the absence of methodologies that transform theory into action means it cannot cope with truly complex issues when cause and effect cannot be easily mapped? Might Critical Systems Heuristics prompt ethical consideration of marginalised stakeholders?

And what might we learn from the speed with which IS has taken hold, and harness our systemic sensibilities and those of IS scientists to further our collective capabilities for designing, implementing and evaluating interventions and policies, striving towards systemically desirable interventions, and thus avoiding a collision where everyone loses.

Systems Thinking, Systemic Change and Equity in Public Health Practice: A Dialogue

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2023 HST: Health and Systems Thinking

Abstract:
In 2020 with the introduction of the COVID 19 virus the world experienced in real time the difficulty of predicting emergent global health consequences of the complex interactions of “under the skin” biological systems, and encompassing ecological systems and human social systems. What has been made increasingly more evident in our global experience in the past three years is how existing social and economic inequity affects who is most vulnerable among our human communities, opening up questions for policy-makers and leaders in governmental public health, as well as those who train them. For decades there have been calls for the incorporation of systems thinking methods and approaches into public health leadership practice, not just academic research, with different approaches to systems thinking more commonly used in different countries (e.g. soft systems in the UK, systems dynamics in the US). The pandemic has heightened public awareness of inequity among citizens previously able to ignore it, and also increased awareness of our interconnections and the consequences for us all. Consequently, calls for understanding the social determinants of health – how race/ethnicity, class, education, access to safe spaces and healthy food, etc. all interact with each other to shape health and well-being – have become more urguent. It has become clearer that systems thinking is required to not just understand but create plans for action to address the health consequences of inequity. In the University of Illinois at Chicago School of Public Health and its DrPH in Leadership Program, practice experience is combined with evaluation and action research to apply systems thinking to address inequity. Panelists will bring to bear their experience in blood donation in the Caribbean; workplace wellness in South Africa; and evolving US federal and health department policies addressing health and its social determinants, including early child education and place-based resources, to discuss: what frameworks for systems thinking are helpful in developing pathways to increase health equity?

Amazonian Perspectivism: Enriching systems thinking by leveraging contributions from indigenous Amerindians

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2023 CSTP: Critical Systems Theory and Practice

Abstract:
Several systems thinkers have argued that underlying all systemic methods and approaches are four universal patterns: distinctions, systems, relationships, and perspectives. These patterns are implicit in the thought processes of multiple Amazonian indigenous communities, constituting what has been denominated Amazonian systems thinking. Hereby, we will focus on the perspective pattern, taking advantage of what anthropologist have called ‘Amazonian perspectivism’. Its study challenges our conception of modern systems thinking. It can enrich the way we understand perspective formation and management within systemic methodologies and tools. We will critically discuss potential contributions of Amazonian perspectivism to contemporary systems thinking. Amazonian perspectivism is regarded as a cosmology that supports a very particular way of seeing the world based on concepts, symbolic elements and distinctions different from those usually employed in the Western world. For example, for Amazonians 'people' involves both Homo sapiens and other non-humans, while Amerindian words that usually refer to 'human beings' do not designate humanity as a natural species, but function as pronouns rather than nouns, indicating the position of the subject, going from substantive to the perspective of the subject talking. Moreover, subjects are not regarded as fixed conditions from which perspectives emerge; instead, perspectives create subjects. Critical systemic thinking has involved the exploration of marginalization processes. In this paper, we will focus on the use of rituals to promote reflexivity about systemic concerns as well as on the ingenious creation of perspectives through the continuous redefinition of systems boundaries by means of the construction and transmutation of bodies. We will also discuss how the marker of difference between perspectives is the body. The authors will explore the implications of Amazonian perspectivism for modern critical systems thinking, discussing how the entanglement of perspectives that Amazonian perspectivism suggests can create a harmonious integrated cosmovision where man, animals and plants may cohabit in an environment-friendly interconnected totality.

Promoting systemic change in our educational institutions through metacompetencies that develop transformative qualities of Being and agency

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2023 DES: Designing Educational Systems

Abstract:
Education systems in Australia are currently in a state of flux and disruption, with student mental health and engagement at crisis levels. This contribution examines how systems awareness and self-awareness in education cannot be separated from the rest of the curricula for students living with impact of global systems changes due to COVID-19 and climate disruption. Moreover, in this context, educators are struggling to keep students engaged and provide skills and competencies needed to navigate uncertain and unsustainable futures. Addressing this challenge, our study examines a proposed set of metacompetencies (or systemic competencies) required for a systems reboot within our educational institutions – including agency, adaptability, creativity, compassion, interbeing, self-awareness and reflexivity – described elsewhere as a Curriculum for Being. Findings this study have demonstrated systemic metacompetencies have served to build student agency for these times of transition – providing social and emotional learning that helps students develop awareness of self in relation to others and systems. This study analyses the application of these metacompetencies for transformative resilience or tresilience in both a secondary school and higher education systems setting. Using methodologies of participatory action research and awareness-based systems change it proposes interventions for a much-flawed current educational paradigm that prioritises individuality and competition over connectedness. The interventions described were prototyped, tested and iterated with students in schools as well as undergraduate students at university, with evidence demonstrating that agency, self-awareness and systems awareness can combine to engage students in profound ways to create a new generation of systemic changemakers.

Interacting across difference: exploring capacities for making sense of diversity and change

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2023 DEI: Diversity Equity Inclusion

Abstract:
In attempts to answer to the call for more just and equitable work spaces, organisational structures and interactions, we assume that more diversity will solve all our challenges. The notion of diversity or difference has come to be a central feature in many of our management and strategic discussions in organisations. Often however, we see difference as a normative goal that would guarantee equity or justice, and advocate for the celebration and inclusion of more difference and diversity in our social and organisational settings, but we rarely understand the lived experience of people in these settings. Generally, differences between colleagues and social settings can be a cause of tension and misunderstanding and without understanding how differences shape and are in fact a condition for meaning-making and complexity, our engagement with difference will remain theoretical and superficial.

From systems theory research we learn that differences are not only the observable differences on the emergent level of the system, but also, and perhaps primarily, all the small or unseen differences which provide the means for emergence to take place. We also learn that the identity (or identities) of the system is a result of these differences and interconnectivities, not something which precedes them. We also assume that more diversity will lead to better collaboration and representation. Everyone comes to an interaction with their histories, moods, experience, skills, worries, intentions, and so on. One cannot but show up in some way or another. Everybody also comes to an interaction with things at stake. At the same time, interaction processes can take on a life of their own, giving rise to dynamics that can, as such, (co-)determine what happens in them, up to and including determining how (and even whether) someone can participate. What is at play in social interactions are individual contributions, but also the dynamics that emerge between participants, and the interaction between these emergent interaction processes and their participants. All of these elements mutually influence, even co-determine each other.

In this paper, I will share some findings of an experimental workshop that was held in 2022 with my colleague, Hanne de Jaegher at the Peter Wall Institute for Advanced Studies, UBC, Vancouver. Through some facilitated workshop, we explored what the experience

of interacting across difference could feel like and what patterns of interaction emerge. From the workshop/experiment, we learnt more about how the dynamics of self-organisation, between the autonomies at play as both individual participants and the interaction between them self-maintain. These insights might be useful for all of us who are interested in organisational change processes and practical approaches for studying interactions.

Systemic consciousness: new horizon for systems practice

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2023 EP: The Embodied Professional: systemic beings in motion

Abstract:
The polycrisis creates a renewed expectation that systems practitioners provide leadership. Are we up to it? This paper reviews the underpinning foundations of current systems thinking and practice. We focus on problem-solving, overly rely on rationalism, and depend on “knowledge” to move ahead. Assembling testimony from a wide swathe of diverse wisdom traditions, crucial fronts on which systems thinking and practice can be advanced are discovered. The referenced disciplines include – action research, models of consciousness/mind, perennial wisdom traditions, indigenous wisdom, trauma-informed practices, healing traditions, and arts-based research. Ideas like holism and enactive cognition – core concepts in systems thinking – do not translate robustly into systems practice. Yet these principles are deployed in other traditions. There are techniques to interrogate the validity and usefulness of objects and formulations in the inner reality of the mind, just as we validate outer reality. Further techniques examine the relationality of the “inner” to the “outer” in dynamic interplay: such witnessing is aware, or reflexive, enactive cognition. These practices are available in approaches outside the slender paradigm of modern rational thinking, a blip in human civilizational history. Western rationality, including systems thinking, believes all consciousness rests on intentionality. The author terms this orientation as the Striving Mind, and introduces two other orientations – the Abiding Mind and the Nescient Mind. Engaging these supports critical reorientations: seeking correct questions instead of “problem-solving”, meta-rational knowing vs “rationalism”, and accepting not knowing/staying with the trouble vs “dependency on knowledge”. These fundamental paradigmatic reorientations are demanded by the polycrisis – a transition well underway, and create a ‘systemic consciousness’. Gaps in the interpretation and theoretical development of other wisdom traditions deter the adoption of useful methods into systems practice. A careful, engaged and compassionate inquiry across these domains can offer a rich understanding for the future development of systems thinking and practice.

Professionalising systems thinking in practice: what's not to celebrate?

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2023 EP: The Embodied Professional: systemic beings in motion

Abstract:
2020 marked a significant landmark for UK recognition of systems thinking in practice (STiP) as a profession with Government approval for a new Level 7 (postgraduate) Apprenticeship Standard associated with an occupational role for the systems thinking practitioner (STP). Professional recognition for the STP can be celebrated on several counts, not least with installing greater confidence amongst users of, and potential commissioners for, STiP. But professionalisation also prompts pause for concern regarding potential systemic downsides. The paper provides a systemic inquiry into the professionalization of STiP based on a lite-touch framing of four sources of influence from critical systems heuristics (CSH): who gets what (motivation)? who owns what (control)? who does what (knowledge/ expertise)? and who suffers what (legitimacy)? The framing opens up conversation and questions regarding key stakeholding issues: (i) do other professions in need for developing STiP capability (ranging from healthcare to engineering) really benefit from having an exclusive separate ring-fenced professional provider? (ii) to what extent might a new external professional body have influence on questioning and challenging, rather than being compromised by, situated machinations of governance? (iii) how might the diversity of STiP be guaranteed rather than diminished by capture through one particular view of a professional competency framing? and (iv) what ethos of professionalism might circumscribe the development of STiP as a profession? On this last question, the paper contrasts two models of possible direction for STiP – technocentric professionalism and civic professionalism; the latter underpinned by an ethos (or Worldview) of 'public work' provision. An ethos of 'public work' (not to be confused with serving only the public sector) suggests STiP as ultimately a 'public good' (source of motivation), inviting dynamics of governance (control), and expertise (knowledge), appropriately customised for different contexts (legitimacy).

Using Systems dynamics to understand the impacts of community renewable energy projects in New Zealand

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2023 SMSE: Systems Modelling and Systems Engineering

Abstract:
Large, established utilities dominate the renewable energy sector of New Zealand. However, local and community actors can also play a role. Community renewable energy (CRE) is defined as renewable energy projects that (a) are managed in an open and participative manner, and (b) have local and collective benefits and outcomes (MBIE, 2019). A range of impacts can be experienced from these projects, such as: cheap electricity, local enterprise creation, improved electricity network resilience, increased acceptance of clean energy, as well as reduced carbon footprints (Berka & Creamer, 2018). A handful of CRE projects have been established, and different project models can lead to different impacts. However, a majority struggle to get off the ground given the currentpolicy and regulatory landscape. A major stumbling block is the lack of CRE impact data that can lobby for suitable support measures needed to build a CRE sector (MBIE, 2019). New methods of impact forecasting - that can (a) capture the range impacts leading from emerging, local energy projects and (b) help identify intervention points within the systems - are needed to help adequately understand the impacts of CRE projects and assist policy makers when shaping national or regional energy systems. This research uses systems thinking and systems dynamics modelling to understand the impacts of CRE projects in New Zealand. It compromises of 4 components:
1) An CRE impact framework for New Zealand,
2) A systems map (see figure1) and conceptual systems model of the potential impacts of CRE projects,
3) A more detailed systems dynamics model and simulation of the Energise Ōtaki solar PV system, its impacts on the community nd leverages points that cam affect key impacts on the project, and
4) A hypothetical CRE programme that forecasts what is needed for long term sustainability of the project.

The Development of a Framework for Improvement of Intensive Care Delivery in South Africa: A Systemic Intervention

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2023 HST: Health and Systems Thinking

Abstract:
Intensive care (ICU) is a small but complex system; context-specific and continually confronted by dynamic changes and challenges in the environment. The aim was to develop a systemic framework for the improvement of ICU delivery. A comprehensive review of ICU literature elucidated the factors affecting the delivery of ICU. A further understanding of ICU delivery was obtained by "making sense of the mess" using a systems approach. Systemic intervention served as the meta-methodology and methods and techniques from interactive planning, critical systems heuristics, soft systems methodology and the viable system model were employed. Making sense of the mess emphasised the complexity of ICU delivery on a situational and cognitive level. It became clear that a single methodology would not suffice but that a pluralist methodology was required to guide improvement in ICU delivery. Based on this understanding, nine principles were formulated to guide the development of a framework. Systemic intervention was again used as the meta-methodology. Interactive planning was identified as the key methodology, incorporating methods and techniques used in the first phase to build a systemic framework. Embedded in the proposed framework are matters relating to systemicity, complexity, flexibility, empowerment, and transformation of ICU delivery. The proposed framework allows for multiple perspectives, including that of marginalised stakeholders, the mitigation of multi-vested interests and power relationships. It is both flexible and adaptable to promote learning about the complex problems of ICU delivery and accommodates the strengths of various relevant approaches to complex problem-solving.

The contribution of Churchman's charactiristics to "diagnosis", first step of a 5-step Action Research process

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2023 AR: Action Research

Abstract:
Susman and Evered suggest a five-step interactive action research process as research method: problem to be diagnosed; plan to be compiled for action; action to be taken; action taken to be evaluated; and learning to be specified. Diagnosing, as first step, has the purpose of holistically interpreting a complex situation. In the context of critical social theory, the result of a diagnosis would be to identify problems which need to be addressed in the subsequent steps, to enable the entity being researched to progress, most likely by suggesting changes to the status quo. With the diagnoses of the problems being key to the success of the steps succeeding it, especially in the critical social theory context where the emancipation of participants is the aim of the intervention, it is important to understand the problem being researched from an all-encompassing perspective also affording deep understanding. The systems approach suggested by Churchman, a critical social theorist working in systems theory, the interdisciplinary study of systems, may be of value in structuring the diagnosis step of action research. Churchman's approach lists five basic considerations that need to be kept in mind when making sense of a system, namely: determining the purpose of a system; the environment in which the system operates; the resources on which the system may draw; the components as sub-systems of the overall system; and the management of the system by coordinating its resources, by means of its components, which are subject to the constraints of the environment. This technique reaches beyond mere insight, and aspires to discover power structures. An action research study illustrates the use of this Churchman technique in the diagnosis of application cycles. As result the value of the technique in this context is highlighted.

The Quiet Revolution: A Lifelong Perspective on Systems Capped by the Discovery of Stem-Systems

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2023 SIEL: Systemic Innovation, Engagement, and Leadership

Abstract:
This presentation uses an emerging, overarching spiritual, scientific philosophy as phases of a narrative structure for a lifetime relationship with systems. The story, in that light, covers not only the evolution of new concepts, models, and practices but the personal, social, political, and cultural contexts in which they occurred.

1) The first spiritual phase attempts to capture the essence of the prevailing environments that influenced the body of work. It includes the effects of Liverpool and its bombings during WWII; the transformational effects of global travel working with BOAC; the hugely positive effects of a single book, J.A.C Brown's Social Psychology of Industry, and the paper we had to write on the effect of theory on practice which I am still writing. The most telling impact is still being worked out. While working in my first real job as a Manager for BOAC at Rome airport, Fiumicino became the best-performing airport in six months without my having managerial control, or spending any extra funds. I had no idea what caused that performance and neither did anyone else. This riddle together with cultural class struggles motivated my move to the USA to study for an MBA. My thesis attempted to solve the riddle of Rome but exhausted the relevant management, organizational, and systems research and still came up with no substantial answer.

2) The second more philosophical phase of system engagement enlarged the perspective I was taking from the study of a single job to the management of whole international corporations and finally to the institutional development of whole countries through the Worl Bank and the United Nations. The phase produced some similar levels of performance but also gave a surprising answer to the high-performance riddle. At that time I saw that power was a central but unexplored and feared topic in organizations and systems. I felt so strongly that in mid-career I took a Ph.D. in Social Systems Sciences with Russ Ackoff, EricTrst, and Hasan Ozbhekan as mentors. Trist's model of Social Ecology combined with Ackoff's idealization, Interactive Planning, and Ozbekhan's shift from a three-dimensional organizational structural perspective to a four-dimensional planning process gave me all I needed.

The resulting theory of power and its relationship to purposes led to a ten-year action research project at the World Bank. Clips from the video "The Quiet Revolution" illustrate the concepts in action in a workshop for twelve African countries that took place in Cape Town. The resulting theory of power and its relationship to purpose was very well received by both international development theorists and practitioners. It produced a new five-dimensional socio-political-technical perspective, or as the Bank declared, a new human-centered paradigm for the design of projects, programs, organizations, and institutes. A book "The Creative Power…." describing

the origins, development, and implications of the approach was published by Routledge in 2009. It finally answered the questions about unexplained high performance. . Power was a central but unexplored and feared topic in organization and in systems.
It was the implicit or unconscious addition of an appreciative dimension to the influence and control levels of organization that provided the answer to Rome's performance. It was not a methodology or improved relations that produced the performance but the use of appreciative power that created a new level and spirit that, in turn, infused the whole with a coherence that didn't exist before.

3) The final scientific phase, in partnership with Gary Smith and his colleagues in ISSS, has been ongoing since the Corvallis 2019 Conference. In tackling System Integration, our efforts are trying to answer three additional evolutionary issues.

a) What are the universal systemic functions that affect and unite the spiritual, scientific philosophy of systems development? We have found nine such standard functions and each can be fractally decomposed to provide one of nine standard frameworks. Gary, for example, has completed this fractal decomposition for one of those standard types and its nine functions and is presenting his results at the Conference.

b) We have learned that, for wholeness, we have to use all nine functions. Evolutionary, we have not learned collectively how to use appreciative level functions that govern the whole and that deal with the 'dark side"' e.g. the hidden motives, emotions, and instincts. Our language and cultural norms favor concepts of "enlightenment". We have discovered that color is a systemic appreciative language that is very helpful in uncovering and explaining such hidden dimensions of the dark side.

c) Every purpose, every system, and every person has their pattern of nine purpose/power functions. In practice, we can map the naturally occurring pattern of those nine functions. We can equally show what that pattern ideally would look like. We can also devise improved patterns that move towards the ideal but limit changes to suit particular values and situational necessities.

Once we accumulated enough practice we discovered that we had assumed a logical process that moved from appreciation (A) to influence (I) and control (C) standards. While that may be a norm many phases of organization and situations require a different ordering e.g. practical projects are more likely to succeed with a C-I-A pattern and political projects with an I-C-A or I-A-C process.

The surprise discovery is the existence of a stem-system found in the center of every ideal system. When fractally divided into its nine functions, the stem-system forms a magic square. It has an order that perfectly balances elements of purpose and power. It has no bias for appreciation, influence or control as a purpose or as a methodology. It provides a form of tensegrity that gives maximum strength with minimum use of energy. In one fell swoop, it provides a balanced perspective able to tackle all three of the evolutionary issues identified above.

These insights are now leading us to work on ISSS to create a common overarching spiritual, and scientific, philosophy that will allow us to honor and transcend the different perspectives contained in the competing concepts, models, and methodologies of our members.

The story shows that ideas, perspectives, processes, models, and methodologies are only part of complex multidimensional inquiries that address our current institutional problems such as poverty, health, energy, inequality, powerlessness, and suicide. Our inherent gifts from nature, in ourselves, our cultures, our species, and our relations to our universe are sources of hidden information, knowledge, and wisdom that lead to a more coherent spiritual, and scientific philosophy that enable us to honor and transcend theories, models methodologies that we rely on but that have not yet evolved enough to tackle these issues of our times.

A Philosophy of Systems Futures: Transdisciplinary Cooperations

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2023 SPhil: Systems Philosophy

Abstract:
“The future cannot be predicted, but futures can be invented.” — Dennis Gabor, 1963. This presentation explores ways in which systems approaches are applied to the study of life and more specifically, critical futures. It offers a brief overview of integrative systems, pattern recognition and the study of futures at various scales from the local and regional to the national and global. The systems sciences have exemplified this convergent approach for more than a century, and in many ways it can be traced back to the synthetic perspective of Leonardo da Vinci. One contemporary methodology that is increasingly employed across domains of inquiry is transdisciplinarity, which acts as a means to integrate the natural sciences, social sciences, the arts and humanities. Authors, scholars, and a variety of entities have engaged in futures research, especially through design, metadesign, and various ecological modes of inquiry. In keeping with a larger goal of my project, I conducted a radial category analysis of the concept of futures. This assisted in developing a more comprehensive view of pattern recognition and its applications in future studies. There is also a range of traditional approaches and techniques that can be involved, for instance: forecasting, backcasting, scenario planning, horizon scanning, insights and social network analysis, strategic and integrative design, as well as science fiction prototyping, storytelling, and immersive productions. A philosophy of systems futures entails not merely an epistemology and ontology, but practical engagements with transdisciplinarity across a plurality of critical futures, including environmental, just, and multiversal futures, each with examples across various scales. Thus, understanding life (as medium, environment, habitat) and living (as mediating, environing, habituating), in addition to meta, meaning along with, not above or beyond, can help to explicate and expand what constitutes living futures, in other words, metalife and metaliving. Indeed, speculative instruments and environments (e.g., collaboratories) are inspiring science–art–design organizations and institutions from local to national health and wellbeing initiatives, as well as from regional to global projects dedicated to responsibility and accountability (notably across systems biology, systems dynamics, and machine learning).

Architecture, Ecology, and Hubris

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2023 SESD: Socio-Ecological Systems & Design

Abstract:
Writing in the context of the emerging environmental consciousness of the 1960s and 1970s, cybernetician Gregory Bateson identified one of the root causes of ecological crisis as Western culture's hubristic tendency to see humans as separate from, above, and in competition with their environment and each other. While Bateson framed hubris in theoretical terms as an "epistemological error", I argue that addressing hubris is not simply a matter of constructing a better epistemology. Hubris is reinforced by experiences of material artefacts and especially the built environment, for instance in the way that buildings (literally) construct sharp distinctions between human and ecological worlds. Hubris can even be replicated in design projects that aim (and seem) to be sustainable, with the result that it is hard to identify and address. If the built environment has promoted hubris, then perhaps it can also be a way to challenge it. Bateson characterized ecology in terms of ideas and mind (rather than matter and energy) and advocated aesthetic (not just technical) modes of engagement with ecological systems. Connecting Bateson's work to architecture's traditional role of situating humans within the world, I explore ways in which the aesthetic (spatial, communicative, experiential) qualities of buildings might contribute to unmaking hubris. In so doing, I sketch out an enriched role for architecture in addressing environmental concerns that encompasses but is not limited to the technical concerns through which sustainability has tended to be framed within architectural discourse. In addition, by locating some of Bateson's key insights with respect to spatial examples, I engage this richly theoretical work in tangible ways.

Interconnected Earth: Advancing Systems Literacy through Systems Process Theory, Conversation Theory, AI-Enhanced Collaboration and more.

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OpenAI

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2023 HSI: Human Systems Inquiry

Abstract:
Introduction:
In the magnificent wilderness of South Africa's Kruger National Park, This presentation develops the Systems Literacy project. We examine the intricate, interconnected global ecosystem., inviting contribution from observations of the interplay of local wildlife, indigenous tribes, varied cultures of South Africa, and participants from around the world.
Problem:
The central problem addressed is the fragmented systems approaches and methodologies that often miss the inherent complexities and interdependencies of modern global challenges. There is a need for Systems Literacy. This work further emphasises the understanding and application of previous work by the author and many others on ocean literacy, earth science literacy, atmospheric literacy, climate literacy, and energy literacy in creating guides for education and learning.
Rationale:
Recognising the value of systems science in studying this problem is fundamental. This lens offers a comprehensive approach to understanding our world, highlighting the interconnectedness of systems, the importance of systems processes such as feedback loops, emergent properties, and non-linear dynamics. This perspective is particularly essential when addressing the complexities of ocean, earth, atmospheric, climate, and energy systems, all of which significantly impact our interconnected world.
Methodology:
The approaches and methodologies embraced in this study include a collaborative and conversational ongoing design process to create a guide to systems literacy that draws upon systems process theory, conversation theory, AI-enhanced collaboration, and many other approaches. Utilizing advanced AI tools like ChatGPT, we delve into various interconnected systems, including biological, social, economic, and ecological, illustrating their shared isomorphic properties. The wisdom of South Africa’s traditional leadership systems and the resilience of its diverse ecosystems provides a rich context for this systemic exploration.
Results:

Expected outcomes of this study include a robust framework for promoting systems literacy, improved collaboration using AI tools, and innovative insights on leadership roles within a systems thinking context. Furthermore, it provides a valuable approach to understand and navigate complex global systems, thereby increasing adaptability, resilience, and innovation. The findings could also form the foundation for future research in developing systems literacy around the world in diverse sectors like business, government, education, health, finance, and not-for-profits.

Exploring the Transformative Power of Visual Art: A Practitioner-Researcher's Journey towards Self-Reflection and Epistemology of Practice in Physical Science Education

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2023 EP: The Embodied Professional: systemic beings in motion

Abstract:
This study aimed to explore the use of visual art as a means of self-reflection and self-transformation by a practitioner-researcher. The goal of this study was explore the potential use of visual art as a complementary tool for facilitating personal growth and transformation, with a focus on a practitioner-researcher's self-reflection and self-transformation in the context of physical science education. The researcher used imaginative teaching practices in physical sciences as a means of driving self-transformative learning and establishing an epistemology of practice. The study was guided by critical social theory, interpretivism, and a living theory approach within an action research methodology. As part of the reflective process, the researcher made use of sketching as a means of self-reflection in her reflective visual diary. By conceptualizing emotions and feelings in the form of detailed artwork, the researcher was able to express and visually represent thoughts and emotions in a more tangible and meaningful way. The process of sketching allowed the researcher to explore her inner world and to externalize inner dialogue in a way that traditional writing or verbal expression may not have allowed. Through this process, the researcher was able to better understand her own emotions and thought patterns, and in doing so, was able to drive her own self-transformation. The detailed artwork in the reflective visual diary served as a visual reminder of the researcher's growth and transformation throughout the study, providing a tangible representation of progress and a source of motivation to continue the journey towards self-improvement. Data was collected through two main action cycles, with sub-cycles addressing imaginative teaching, transformative learning, and personal reflection. The data suggested that the integration of artistic elements as imaginative elements resulted in positive experiences for the participants, and ultimately led to the development of an epistemology of practice that integrated directive, conceptual, and experiential knowledge. The study highlights the potential of visual art as a complementary tool for facilitating personal growth and transformation, and proposes further research on the transformative learning of learners in the physical science classroom and the active implementation of a developing epistemology of practice within the teaching practice of physical science educators.

Applying the 'Extended Dynamic Sustainability' framing to understand sustainability of education intervention outcomes

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2023 OTSC: Organisational Transformation and Social Change

Abstract:
International donor organisations funding various interventions in developing countries are required to demonstrate the degree to which these interventions are successful. Therefore, programme evaluations often investigate whether an intervention is implemented as planned and determine the degree to which the interventions reached the planned outcomes and impacts during the funding timeframe. Increasingly, however, donors are considering sustainment of intervention outcomes after the completion of an intervention as an important success factor. Systems thinking provides useful concepts and tools to investigate the question of outcome sustainment. The current investigation explored "To what extent can the systems concept 'extended dynamic sustainability' be used to explain why some results of a donor-funded education development intervention were sustained ten years after its conclusion?" To address that question, the researcher identified a specific case to explore with systems thinking: an ex-post evaluation conducted in 2016, and commissioned by an international donor, the United States Agency for International Development (USAID). That ex-post evaluation confirmed that an education development intervention, the Kimberly Thusanang Programme (KTP) implemented between 1998 and 2006, resulted in sustained outcomes, which were directly linked to the KTP's goal of improving school governance in the Francis Baard education district the Northern Cape. The current research expanded on the ex-post evaluation's analysis by introducing a soft systems framing of sustainability. Using qualitative data analysis, the researcher identified the types of sustainability found in the ex-post evaluation data set. Then, by applying Stockmann's (1993a) 'extended dynamic sustainability' concept, the research found that the KTP intervention and some of its benefits were dynamically sustained through the general causal sustainability mechanisms of problem-solving, modelling and multiplication. These findings are likely useful to understand intervention sustainability, to design sustainable development interventions, and to evaluate intervention success. Further exploration of these general sustainability mechanisms needs to be conducted to determine if these mechanisms are generalisable to other development interventions and their sustained outcomes.

Using Emergent Knowledge to Explore Common Perceptions of Well-Being

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2023 SSSS: Science, Spirituality and Systems Science

Abstract:
This paper explores the potential role of systemic research and experiential learning to document emergent knowledge among somatic movement practitioners. Somatic practitioners study body sensation to hone motor skills and body-centered awareness. I explored how somatic practitioners related movement experiences to their perceptions of physical and psycho-spiritual well-being. I used an online systemic research tool, WindTunneling (developed by systemic science researchers Bruce McKenzie and Jane Lorand), to gather individual experiential learning insights as an integrated part of a 16-week somatic movement program in 2022. This program introduced 978 international participants to a body-centered philosophy to study bodily sensation, practice somatic communication, and explore using movement to enhance physical and psychological well-being. WindTunneling uses a structured process of anonymity and transparency to pool collective knowledge, which facilitates pattern emergence and sense-making by the researcher and the community at-large. I used WindTunneling with the aim to identify common perceptions of subjective vitality and well-being. The discovery of commonalities could be a meaningful measurement of the program's curriculum to develop individual capacity to use movement to enhance well-being. During the program, participants recorded 1,164 anonymous body sensation insights in 13 WindTunneling knowledge pools. These insights correlated to 13 somatic skills. Insights were transparently available to all participants to read and respond. I am synthesizing these insights to document shared perceptions within the global practitioner community. Successful implementation of this research methodology should foster shared understanding, meaningful participation, and community belonging among global practitioners.

A Final Word

Dear ISSS friends,

This is my last message as President of the ISSS. I had a fulfilling year as I achieved the objectives I set, namely for the mini-symposia to present different systems perspectives (conditioned realities), and to host the annual meeting in Africa. We had 42 mini-symposia sessions since September 2022, and I want to thank the speakers for their commitment. A number of these sessions had more than one speaker and all the speakers were ready to present their talks, contributing to the achievement of the objective. Every session had more than 30 attendees with more than 100 different people attending in total. What a true celebration of our diversity!

Since I started the newsletter in November 2021, we published a newsletter every month, along with one additional ISSS 2023 Conference Special Edition. This would not have been possible without the commitment of John Challoner who did the page layout and Louise McCulloch who looked after the diary items. Thank you both for your commitment to continue this work in future.

Thank you for attending this meeting in Africa! Months of planning, negotiations, and a fair bit of tension and stress are all turned into enjoyment and passion for the 100 people participating and 22 guests. Our participants are from all over the world! But making me proudest, are the 47 South Africans attending, many of whom I have not known before. Bringing the conference to South Africa made it possible for these 47 participants to experience our ISSS community in person, something that would not be affordable had the conference not been on their doorstep. Thank you also to the North-West University who provided support to the ISSS, me personally and 10 colleagues to make this first ISSS conference in Africa a reality.

Our Systems Thinking in Practice (STiP) pre-conference workshop is indeed a unique addition to the programme for the 50 people attending. Thank you to Ray Ison and Martin Reynolds for their hard work to create this special event.

At the end of my presidency, I would like to thank the ISSS Board of Directors, and a number of past presidents, for supporting my initiatives and their patience with me! As Past-President I will continue to serve the society in a different capacity, focussing on the Proceedings and the Yearbook. I wish the President-Elect, Michele Friend, and the new Board all the best for their term. Finally, I want to thank my family for their support and understanding.

Regards

Roelien