Rachel Jones and Raimo P. Hämäläinen

Esa Saarinen and Systems Intelligence

"Life does not wait, and the challenge is to live it better, improving the act on the spur of the moment" (Saarinen, 2008a, p. 18).

Several years ago, Esa Saarinen was dining in Helsinki with a group of colleagues when one of the visiting academics asked a provocative question: "What single word sums up your desire for your life?" Professor Saarinen did not hesitate. "Influence," he said. "I want to feel I have made a difference." Those of us who have worked with him on Systems Intelligence know he has already achieved his goal. Working together with friends and colleagues, he has driven and shaped a new theoretical lens that will not only have an impact in academic and organizational settings but in people's lives.

A new lens

Few could have foreseen the extent of the positive outcomes that Esa Saarinen's acceptance of an invitation to join the Systems Analysis Laboratory (at then Helsinki University of Technology, now Aalto University) would have. Professor Saarinen joined the group in 2001, bringing with him his deep understanding of the human condition. After an interest in theoretical philosophy in his early career, he had moved into work on applied philosophy and philosophical practice. In tandem with this shift in focus came a growing interest in enhancing lives, particularly within organizational and leadership settings. His quest was to bring about positive change in people's personal and work life contexts in optimistic and pragmatic ways. With this fresh perspective, Professor Saarinen focused his often more technically-minded colleagues and students on human-centered systems.

At first glance, philosophy and systems thinking may seem strange bedfellows. Systems are typically thought of as the technical structures that we engage with in this highly complex and technology-driven era. However, systems thinking has long had surprisingly close connections with philosophy. Ludwig von Bertalanffy, considered the founder of general systems theory, identified the philosophy of systems as a cornerstone of systemics (Ramage and Shipp, 2009; Skyttner, 2008). Another pioneer, C. West Churchman, regarded as both a philosopher and a systems scientist, pondered how to improve the human condition by means of the human intellect (Ulrich, 2011). Professor Saarinen, too, easily developed an understanding of systems and began to build on existing perspectives in the field with an applied philosopher's perspective. He started to work on the philosophical dimensions of systems thinking for both teaching and research.

The teaching began with Professor Saarinen's lecture series under the title: "Philosophy and Systems Thinking." In these lectures, open to and attended by a wide audience, he unites the philosophical approaches of classical philosophers like Socrates and Aristotle with the tenets of modern systems thinking. The aim is to stimulate the participants to cognitively appraise their lives, attend to their own flourishing, and focus on important goals and projects. The lectures have become a philosophical performance, where Professor Saarinen acts as the conductor of a kind of concert of thinking. He defies and challenges the expectations and conventions of university lectures, opening up new ways to be for those in the audience. His innovative approach to communicating his ideas has been crystallized in two recent papers: "Philosophical lecturing as a philosophical practice" and "The Paphos seminar: Elevated reflections of life as good work" (Saarinen and Slotte, 2003; Saarinen, 2013).

A further teaching contribution came in collaboration with Professor Raimo P. Hämäläinen, the director of the Systems Analysis Laboratory and a long-time friend. Sparking off their unique perspectives, the philosopher and the systems scientist established a seminar series on creative problem solving (known as LOR). Drawing from the extensive body of work by such eminent systems scholars as Churchman, Peter Senge, Ralph Stacey, Herbert Simon, Michael Jackson, and Robert Flood, they combined systems approaches with broader humanistic ideas, including seminal studies on intelligences by Howard Gardner, positivity by Barbara Fredrickson, and flourishment by Martin Seligman.

Enriched by these varied perspectives, Professor Saarinen and Professor Hämäläinen's discussions soon saw them combine ideas from both systems and thinking in new ways. Intuitively, they knew that somehow bringing together systems concepts with how people think and behave had the potential to stimulate betterment in human life. They saw in the early systems literature the usefulness of systems concepts to explain many social phenomena, no matter what the scale of the system. However, something was still missing from the existing literature because systems concepts had not had a visible impact on people's everyday lives or organizations, something that leading systems thinker Russell Ackoff (2006) had noted in his paper "Why few organizations adopt systems thinking." Systems approaches, the two colleagues realized, had yet to resonate with a general audience. The concepts needed to be understood and appreciated at a personal level to really bring about change. They noted that this was particularly relevant because we all live in and get along in systems all the time. Indeed, we seem to have some kind of a natural systems engagement skill.

This was the insight that led them to bring together two previously unrelated concepts: "systems" and "intelligence." The phrase Systems Intelligence captures what they see as the innate but learnable capacity that humans have to behave wisely within systemic contexts. It focuses on positive action within systems to improve the human condition. Defined as the human ability to act intelligently in the context of complex systems that involve interaction and feedback, Systems Intelligence offers a pragmatic and personal approach to life in systems.

Systems Intelligence in daily life

Every day humans live immersed in social systems, dynamic groups of interconnected people functioning together as a whole. Given that we interact with many systems, it makes sense that we do our best to understand how they work and enhance our experience of them. Systems Intelligence is about the benefits of considering what systems we are engaged with, what they look like, how they behave, and how they influence how we behave. Just as importantly, we can consider our own impact on, and contribution to the systems in our life. We can understand how we both perpetuate and create systems, and how we all see the same systems from our own unique perspectives.

As the term indicates, Systems Intelligence relates both to systems and to intelligence. When considering intelligence, most people automatically think of academic ability. This is hardly surprising given that traditional measures of intelligence within western society focus on an individual's analytical, mathematical and linguistic abilities.

Over the last few decades, however, a more general perspective about intelligence has gained prominence, stimulated by the work of Howard Gardner (1993), Daniel Goleman (1995; 2006), and others. This perspective asks us to think about the capabilities of the chess player, the violinist, and the athlete. How do we account for talents in these endeavors? These, too, are types of intelligence and, what's more, they can be improved via learning. What about people's capacity to manage social relationships and their emotional life? When we live more intelligently with our emotions, we can harness them to help rather than hinder us. The idea that when we live more intelligently with systems, they, too, help us rather than hinder us, is a natural extension to our understanding of intelligence. In this way, Systems Intelligence represents a natural step forward from Emotional and Social Intelligence.

The second, and essential, part of Systems Intelligence, is the idea of a system. Irrespective of our backgrounds, systems are fundamental to how we live our lives. Typically, when we hear the word "system", we think of mechanisms rather than people. We most readily associate systems with things like factory machinery producing goods or with self-contained mechanical objects like cars. These examples are indeed systems. That is, they consist of a group of independent but interrelated elements that perform intended tasks comprising a working whole. Systems have inputs and outputs; they need to be coordinated and maintained to work; and they are made up of smaller sub-systems that perform specialized functions. They also have feedback loops, so the function of any one part of the system is affected by the other parts. These are characteristics that help define technical systems.

It is easy to see that the concept of system closely relates to human life and organizations as well. Biologically, the human body with its many functions is a system. It is made up of many interacting parts, from individual cells to complex organs, and like mechanical systems, it requires inputs such as food and produces outputs such as physical movement. The coordinated functioning of many subsystems within systems, such as the lymph system or the brain is essential. The body, like all systems, has multiple feedback loops. During physical activity, for example, the heartbeat is elevated to increase blood flow to the muscle cells. We also breathe faster to increase oxygen intake, and we sweat to eliminate the extra heat produced by our exertion.

Systems Intelligence, however, is more about seeing the social world, embedded in the physical world, as consisting of life in systems. Consider a family, for example. It consists of various individuals, but those individuals together are part of a larger whole. Family members interact and develop relationships, which if not nurtured can lead to problems in the family unit. Within the extended family, smaller family units exist. Each family member might even define and describe the family system slightly differently. The relationships between individuals create the family as a system, but there are other aspects to the system as well. The house a family lives in, for example, and the family traditions and habits, like regularly visiting the grandparents or eating dinner together during the week, all matter. At the same time as belonging to the family, individuals also have different professions, hobbies, and friends. They simultaneously belong to other systems.

Families, workplaces, sports teams, social clubs, orchestras, and neighborhoods – all these groups of individuals functioning together can be described with the term system. We always belong to many systems simultaneously. We share these systems with others, yet we all can see and experience them differently. Realizing that we have different experiences of the same systems is a key insight for developing our Systems Intelligence, yet one we struggle to appreciate. Despite this, somehow, without ever overtly conceptualizing our world in systems terms, we work out how to live in these systems.

Essentially, on a daily basis throughout our lives, we navigate and nurture, participate in and rely on, and even create, a variety of social systems. In other words, every day we act with Systems Intelligence. We act intelligently within the systems within which we live our lives. We cannot and do not focus just on ourselves, but also on the bigger picture around us. We make decisions, we learn, we adapt, we respond, we cope. But we can do more than just cope – we can actually flourish, succeed, and excel. Unlike the traditional understanding of intelligence, IQ, Systems Intelligence is not only a talent we are born with, it is also something we can improve.

It is also something that so far only a few of us have heard about. When we do hear the phrase, though, somehow, mysteriously, the combination of these two words opens up the world in new ways. Systems Intelligence is a phrase that activates something already within us. Something nascent and deep, yet unarticulated. Something that is just out of reach, and yet we know is there. A willingness to look for the connections and the wholes that encompass human experience. An appreciation of context. An understanding that what we do matters, and that we can improve what we do. As a concept, it opens people's minds to the possibilities of positive action and their own capabilities.

Systems Intelligence and academia

We feel the concept of Systems Intelligence represents a significant development in the field of systems science. Traditionally, systems thinking has emphasized the importance of wholes as it models systems of interaction and feedback from the outside. In contrast, Systems Intelligence places the individual's active and practical thinking in real life systems at its center. It is concerned not with modeling and describing systems, but with engaging and acting within systems.

Consequently, Systems Intelligence necessarily accounts for the emotional aspects of life in sys-

tems. It treats human agents in systems as emotional as well as rational beings, and allows for the influence of the senses as well as the cognitive capabilities when acting within systems. Furthermore, Systems Intelligence extends traditional systems thinking by focusing on the opportunity for positive human and systems growth. It looks at how we can develop the resources to enhance our lives in systems rather than focusing on what creates problems. Whereas traditional systems thinking has typically been about describing, understanding and so being able to control systems, Systems Intelligence focuses on the human capacity to imagine and work towards positive futures.

Several papers exploring Systems Intelligence and its relationship to earlier, more traditional systems thinking have been published in a variety of academic journals. These include "Systems Intelligence thinking as engineering philosophy" (Saarinen, Hämäläinen, Martela, and Luoma, 2008), "Systems Intelligence: A key competence for organizational life" (Hämäläinen and Saarinen, 2006), and "Systems Intelligence – The way forward? A note on Ackoff's 'Why few organizations adopt systems thinking'" (Hämäläinen and Saarinen, 2008b). While Professors Saarinen and Hämäläinen are embedded in academia, they have also sought to make Systems Intelligence a concept accessible to all for the betterment of individual lives. To that end, the majority of publications and other writings are freely accessible on the website http://systemsintelligence.aalto.fi/.

Even a cursory glance at the Systems Intelligence web pages shows how interest in Systems Intelligence continues to grow. Stimulated by their own discussions, interaction with colleagues and students, and extended research and reading, the professors began to publish actively on Systems Intelligence. The annual seminars in particular inspired the early articles that outlined Systems Intelligence and that can be found in the volumes of essays published between 2004 and 2010. The seminar participants – many of whom were doctoral students and working in a variety of professional disciplines such as architecture, management and education – were also encouraged to explore the application of Systems Intelligence in their own areas of expertise. This produced some exceptional and interesting essays on a variety of topics, including Systems Intelligence and the environment, Systems Intelligence and leadership, and Systems Intelligence and architecture.

Professor Saarinen was particularly drawn to the application of the Systems Intelligence perspective in infant research where the relationship between mother and child has recently been studied in systemic terms (Beebe, Rostin, Sorter, and Knoblauch, 2003). Systems Intelligence also found a home in the nursery/kindergarten and school setting (Sajaniemi, Lindh, Sinkkonen, and Kontu, 2004). It was a natural fit given that a school is a system responsible for nurturing the human systems of its charges. Professor Saarinen collaborated with Dr. Nina Sajaniemi, a specialist in teacher and early childhood education at the University of Helsinki, who developed a course for special education teachers on Systems Intelligence. More than a hundred students each year complete a case project in Systems Intelligence and their schools. This is likely to have a long-term impact on the way teachers teach. Similarly, in conjunction with his then doctoral student, now PhD, Frank Martela, Systems Intelligence was introduced into the realm of elderly caregiving (Martela, 2012).

As writings and presentations on Systems Intelligence began to disseminate, and Professor Saarinen began to use the concept more extensively in his university lectures and organizational seminars, academic colleagues were drawn to its explanatory power. Systems Intelligence has conse-

quently had an impact not just on the systems thinking community, but also on organizational scholarship in general, and real-life organizations in particular. His work with Merja Fischer, who completed her doctorate under his guidance, on business-to-business interactions and positivity is one example of this (Fischer, 2012). Professor Saarinen's relationship with the Positive Organizational Scholarship community (found at www.centerforpos.org and http://www.thegoodproject.org), such as his contribution to The GoodWork Project (Saarinen, 2013), has been fruitful in disseminating the ideas of Systems Intelligence to a wide academic audience, and his work in organizations around the globe has allowed him to take the message to individuals in leadership positions.

Systems Intelligence is also expected to offer fresh perspectives in engineering philosophy (Saarinen, Hämäläinen, Martela, and Luoma, 2008) and operations research (Hämäläinen, Luoma, and Saarinen, 2013). Operations research, for example, is about solving real life problems and the problem solving process with the analyst and the problem owner always creates a system. Here Systems Intelligence is a useful lens for helping this process succeed. The paper discussing this is expected to open a new research tradition in this field.

Attracted by the theoretical grounding and real-world potential of Systems Intelligence, a team of international collaborators emerged, with many visiting the laboratory. Distinguished international academics such as Howard Gardner and Barbara Fredrickson came to present and discovered the impact of their own work unfolding in Systems Intelligence. Colleagues in New Zealand, Rachel Jones and Jim Corner, began to explore the links between Systems Intelligence and communication and developmental psychology. The Systems Intelligence pages on the Systems Analysis Laboratory website now link to a number of publications in the field and the team of international collaborators.

Contributions from a young colleague at the University of Innsbruck, John Rauthmann, on intelligence measurement and trait scales, led to the exploration of Systems Intelligence from the personality psychology perspective (Rauthmann, 2010a, 2010b, and 2010c). In addition, Professor Aelita Skarzauskiene of Mykolas Romeris University in Lithuania has begun to study the measurement of Systems Intelligence competencies for leadership (Skarzauskiene, 2012). Professors Saarinen and Hämäläinen in collaboration with Juha Törmänen, a student at Aalto, have also considered how Systems Intelligence might be evaluated. Their pioneering work has resulted in the first questionnaire designed to assess an individual's Systems Intelligence across a number of dimensions (Törmänen, 2012). The dimensions are as follows:

Systemic Perception – our ability to see and feel the systems around us;
Attunement – our capacity to connect with others and the systems we engage in;
Positive Engagement – the quality of our communicative interactions;
Reflection – our capacity to think at a meta-level and grow cognitively;
Positive Attitude – our approach to life in systems;
Spirited Discovery – our willingness to engage creatively;
Wise Action – our ability to behave with understanding; and
Effective Responsiveness – our talent at finding appropriate actions.

The Systems Intelligence inventory is able to capture new components of our human abilities that the earlier psychological tests have not been able to describe. This provides exciting evidence

for the validity of Systems Intelligence being a new trait (Törmänen, 2012). If the reader is interested in evaluating his or her own Systems Intelligence, the link can be found at www.systemsintelligence.info. The quiz makes it possible to gain a sense of how one acts within systems and how an individual's score relates in comparison to others who have completed the test.

A flourishing future

The momentum around Systems Intelligence continues to build. A recent journal article by Frank Martela and Esa Saarinen (2013) showing how Systems Intelligence enriches the systems discourse of psychoanalytic therapy was published in *Psychoanalytic Dialogues*. Work continues on the manuscript for the first book on Systems Intelligence for a general audience. Professor Saarinen continues to take the concept of Systems Intelligence to his audiences around the world, in particular through his visits to top US universities like Harvard and MIT.

It is clear that the new concept of Systems Intelligence will be one of Professor Saarinen's lasting contributions not just to the systems field, nor even just to academia, but to people. It is a concept that gives those who hear of it a new vitality and fresh ways of thinking. It is a concept that will continue to have an impact in a number of areas, including organizational and personal growth, particularly when combined with positive organizational scholarship. Through his generous collaborations with others, and the energy and sincerity with which he engages with life in systems, Esa Saarinen continues to model the way we can empower ourselves with Systems Intelligence.

About the authors

Rachel Jones holds two PhDs, the first in English literature and the second in Knowledge Management. Her research interests include Systems Intelligence, visual methods, and communication in systems. A New Zealand-based member of the Systems Intelligence research group, Dr. Jones has published in several academic journals and is currently working on a book about Systems Intelligence with Professors Hämäläinen and Saarinen.

Professor Raimo P. Hämäläinen is director of the Systems Analysis Laboratory in the School of Science, Aalto University and co-director of the Systems Intelligence research group together with Professor Esa Saarinen. Besides Systems Intelligence the research interests of Prof. Hämäläinen include decision making and game theory, environmental modelling and decision making, and biological systems. He is also the designer of many widely used decision support systems.

Bibliography

Ackoff, Russell. 2006. "Why Few Organizations Adopt Systems Thinking." Systems Research and Behavioral Science, 23: 705-708.

Beebe, Beatrice, Rostin, Judith, Sorter, Dorienne, and Knoblauch, Steven. 2003. "An Expanded View of

Intersubjectivity in Infancy and its Application to Psychoanalysis." Psychoanalytic Dialogues, 13 (6): 805-841.
Fischer, Merja. 2012. "Linkages Between Employee and Customer Perceptions in Business-to-business Services – Towards Positively Deviant Performances. Doctoral dissertation 7/2012. Espoo: School of Science, Aalto University.
Gardner, Howard. 1993. Frames of Mind: The Theory of Multiple Intelligences (10th ed.). New York: Basic Books.
Goleman, Daniel. 1995. Emotional Intelligence. New York: Bantam Books.
Goleman, Daniel. 2006. Social Intelligence: The New Science of Human Relationships. New York: Bantam Books.
Hämäläinen, Raimo P., Luoma, Jukka and Saarinen, Esa. 2013. "On the Importance of Behavioral Operational Research: The Case of Understanding and Communicating about Dynamic Systems." European Journal of Operation Research, 228: 623–634.
Hämäläinen, Raimo P., Luoma, Jukka, and Saarinen, Esa. 2011. "Acting with Systems Intelligence: Integrating Complex Responsive Processes with the Systems Perspective." The Journal of the Operational Research Society, 62: 3-11.
Hämäläinen, Raimo P., and Saarinen, Esa. (Eds). 2010. Essays on Systems Intelligence, Espoo: Systems Analysis Laboratory, Aalto University, School of Engineering and Technology.
Hämäläinen, Raimo P., and Saarinen, Esa. (Eds). 2008a. Systems Intelligence – A New Lens on Human Engagement and Action, Espoo: Systems Analysis Laboratory, Helsinki University of Technology.
Hämäläinen, Raimo P., and Saarinen, Esa. 2008b. "Systems Intelligence – The Way Forward? A Note On Ackoff's "Why Few Organizations Adopt Systems Thinking."" Systems Research and Behavioral Science, 25 (6): 821-825.
Hämäläinen, Raimo P., and Saarinen, Esa. (Eds.). 2007. Systems Intelligence in Leadership and Everyday Life, Espoo: Systems Analysis Laboratory, Helsinki University of Technology.
Hämäläinen, Raimo P., and Saarinen, Esa. 2006. "Systems Intelligence: A Key Competence in Human Action and Organizational Life." Reflections: The SoL Journal, 7 (4): 17-28.
Hämäläinen, Raimo P., and Saarinen, Esa. (Eds). 2004. Systems Intelligence – Discovering a Hidden Competence in Human Action and Organizational Life. Helsinki University of Technology, Systems Analysis Laboratory, Research Reports A88, October 2004.
Jones, Rachel, and Corner, James. 2011. "Stages and Dimensions of Systems Intelligence." Systems Research and Behavioral Science, 29: 30-45.
Jones, Rachel, Corner, James, and Hämäläinen, Raimo P. 2010. "Systems Intelligence as a Lens for Managing Personal Knowledge. In Personal Knowledge Management: Preparing for Inevitable Change, David Pauleen & G. E. Gorman (Eds.), 79-98. Surrey, England: Gower.
Leppänen, Ilkka, Hämäläinen, Raimo P., and Saarinen, Esa. 2007. "Intentions and Systems Intelligence: Prospects for Complexity Research." Manuscript, 28 September 2007.
Luoma, Jukka, Hämäläinen, Raimo P., and Saarinen, Esa. 2008. "Perspectives on Team Dynamics: Meta Learning and Systems Intelligence." Systems Research and Behavioral Science, 25 (6): 757-767.
Martela, Frank. 2012. "Caring Connections – Compassionate Mutuality in the Organizational Life of a Nursing Home." Doctoral dissertation 144/2012. Espoo: School of Science, Aalto University.
Martela, Frank, and Saarinen, Esa. 2013. "The Systems Metaphor in Therapy Discourse: Introducing Systems Intelligence." Psychoanalytic Dialogues, 23: 80-101.
Ramage, Magnus, and Shipp, Karen. 2009. Systems Thinkers. London: Springer.
Rauthmann, John. 2010a. "Measuring Trait Systems Intelligence: First Steps Towards a Trait-SI Scale." In Essays on Systems Intelligence, Raimo P. Hämäläinen and Esa Saarinen (Eds), 89-117. Espoo: Systems Analysis Laboratory, Aalto University, School of Engineering and Technology.
Rauthmann, John. 2010b. "Psychological Aspects of Systems Intelligence: Conceptualisations of a New Intelligence Form." In Essays on Systems Intelligence, Raimo P. Hämäläinen and Esa Saarinen (Eds), 29-59.

Espoo: Systems Analysis Laboratory, Aalto University, School of Engineering and Technology.
Rauthmann, John. 2010c. "Systems Intelligence as a Trait: A Meta-Model for a Systemic Understanding of Personality." In Essays on Systems Intelligence, Raimo P. Hämäläinen and Esa Saarinen (Eds), 61-87. Espoo: Systems Analysis Laboratory, Aalto University, School of Engineering and Technology.
Saarinen, Esa. 2013. "The Paphos Seminar. Elevated Reflections on Life as Good Work." The Good Work Project Report Series, Number 80, Graduate School of Education, Harvard University.
Saarinen, Esa. 2008a. "Philosophy for Managers: Reflections of a Practitioner." Philosophy of Management, Vol. 7, Supplement 2008 (Reprinted in Systems Intelligence – A New Lens on Human Engagement and Action, 2008).
Saarinen, Esa. 2008b. "Philosophy in the 21st Century: Socratic Philosophy That Matters and Engages With People." International Academy of Philosophy, News and Views, no. 20.
Saarinen, Esa, Hämäläinen, Raimo P., Martela, Mikko, and Luoma, Jukka. 2008. "Systems Intelligence Thinking as Engineering Philosophy, Extended Abstract" 29 August 2008.
Saarinen, Esa, and Slotte, Sebastian. 2003. "Philosophical Lecturing as a Philosophical Practice." Practical Philosophy, 6 (2): 7-23.
Sajaniemi, Nina, Lindh, Raimo, Sinkkonen, Hanna-Maija, and Kontu, Elina. 2004. "Accelerated Learning, Teaching and Systems Intelligence." In Systems Intelligence – Discovering a Hidden Competence in Human Action and Organizational Life, Raimo P. Hämäläinen and Esa Saarinen (Eds), 273-280. Helsinki University of Technology, Systems Analysis Laboratory, Research Reports A88, October 2004.
Skarzauskiene, Aelita. 2012. "Systems Intelligence Competencies for Leadership Performance in the Complex World." The Asian Business and Management Conference Proceedings, 229-241. Osaka, Japan.
Skyttner, Lars. 2008. General Systems Theory: Problems, Perspectives, and Practice. New Jersey: World Scientific.
Törmänen, Juha. 2012. "Systems Intelligence Inventory." Master's thesis. Espoo: School of Science, Aalto University.
Ulrich, Werner. 2011. "An Appreciation of C. West Churchman." International Society for the Systems Sciences, http://projects.isss.org/C_West_Churchman.