Systems Intelligence: a Key Competence in Human Action and Organizational Life

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Suppose the veil of uncertainty is to stay. Suppose you have to act, without knowing what your choices ultimately amount to. Suppose you are in a situation where external forces are at play, influences move hither and thither, the future is uncertain, and still you have to act.

You do not have the luxury of a theoretician to seize the situation or the flow of time, in order to analyze the various underlying patterns of the system you are embedded in. And yet you wish to act intelligently, indeed you must.

By Systems Intelligence[1] we mean intelligent behavior in the context of complex systems involving interaction and feedback. A subject acting with Systems Intelligence engages successfully and productively with the holistic feedback mechanisms of her environment. She experiences herself as part of a whole, the influence of the whole upon herself as well as her own influence upon the whole. By experiencing her own interdependence in the feedback intensive, interconnected and holistically encountered environment, she is able to act intelligently.

Systems Intelligence reaches beyond Systems Thinking in its pragmatic and active, personal and existential emphasis.

We believe that Systems Intelligence is a key form of human behavioral, life-orientational and context-adaptive and situationally creative intelligence. We see it as a higher level cognitive capacity, a form of intelligence, referred to by Howard Gardner in his theory of multiple intelligences[2]. The idea of Systems Intelligence, we hold, represents the next level in the Systems Thinking Movement and can provide a significant fresh opening for the Organizational Learning Movement.

The Systems Intelligence approach acknowledges the systemic nature of the world out there but its main emphasis is upon the concept of a system as part of the human experience and life-orientation.

"A system" is a generative frame within which a subject experiences her life as taking place. The system moves, pushes, restricts, conditions, encourages, suggests, seduces, and commands: it seems to have a will and voice of its own. There is no full knowing exactly what it is. Life as moved, pushed, restricted, conditioned, encouraged and commanded by systems: that is the existential set-up of my life as it takes place.

In order for the human race to have succeeded in the course of thousands of years, the race clearly must have had some form of practical intelligence in many ways unique to it. That intelligence must have demonstrated itself in action, including modes of reacting to, adjusting to and making use of changing circumstances and abrupt aspects

of sudden situations. Insight, gaining knowledge, judgment and analysis must have had a prominent role in the success story of the human race but before them there was action – action that must have had intelligence to it with respect to the immediate contextual challenges and possibilities and even before being acknowledged by a rational subject *as* intelligent.

Suppose intelligence-as-embedded-in-action and with respect to the situation, context, environment, locality would come first – Systems Intelligence.

From Systems Thinking to Systems Intelligence

As we launched the Systems Intelligence project, our starting point was Peter Senge's *The Fifth Discipline*[3]. But we felt that the link between Peter's discipline of "Personal Mastery" and his discipline of "Systems Thinking" was missing.

The Systems Intelligence approach is basically about taking Senge's discipline of Personal Mastery and the systems *perspective* as fundamental, and considering systems *thinking* only secondary.

There is an objectifying bias, a bias for cognitive rationality and external view point in Systems Thinking, we feel. System Thinking highlights a domain of objects it believes are neglected – systems. But they remain objects nonetheless, entities to be identified and reflected from the outside. The Systems Intelligence approach wants to avoid this externalist trap.

Another aspect in the descriptions of Systems Thinking we felt uncomfortable with was the negative impacts that systems are often portrayed to produce. In the beer game, the individual can never fully succeed. She cannot flourish. One can improve one's game performance somewhat but ultimately the system structure forces you to acknowledge your failure.

Similarly, the "System Archetypes" of Systems Thinking focus on describing how things can go wrong when systems structures are not acknowledged. "Limits to Growth", "Shifting the Burden", "Eroding Goals", "Tragedy of the Commons", "Fixes that Backfire" all highlight the negative traps people can fall into as a result of not appreciating the relevant systems structures.

The Systems Intelligence approach, in contrast, focuses on *what people do right and could improve upon in systemic settings*. It assumes that people possess a kind of "pre-rational and pre-reflective systems thinking" as an inherent feature of the human life-orientational basic intelligence.

The key idea is one of flourishment, as opposed to avoiding pitfalls. Systems Intelligence thus calls for a Positive Systems Scholarship, and sides with "Positive Organizational Scholarship"[4] and "Positive Psychology"[5] movements in its focus on human flourishing, in contrast to human malfunctions. Systems Intelligence also reflects the approach of "Action Research"[6].

Since we launched the idea of Systems Intelligence in 2002, it has been applied to avoiding conflicts in environmental management, merger and acquisition problematics, class-room pedagogy, themes of rewards and compensation, the Theory of Constraints, Sun Tzu, and to management and leadership coaching, to name a few[7]. During the past few years the Systems Intelligence approach has already become something like a movement in organizational life in Finland discussed even on the chief editorial page of our main national newspaper.[8]

It Works in Practice but Does It Work in Theory

As we started out the Systems Intelligence project, we had the idea that it is essential to combine several perspectives which have traditionally remained isolated in academic conceptualizations and intellectual life:

1. *Philosophy of life* as an everyday activity reaching out to people irrespective of their background;

2. *Systems perspective* in its emphasis of the holism and complexity of essential phenomena of human life;

3. Humanly tuned *leadership for change* that builds on the hidden dimensions of human subjectivity, existential situation, and interaction;

4. Appreciation for *humanly rich activities* such as sports, music, performing arts and successful conduct of the everyday.

We were interested in human activities that worked, even when there was no theory to explain why they worked, or even a recognized need for a theory.

The starting point was pragmatic and in the engineering mindset. Hämäläinen's background is in engineering sciences and operations research (often referred to as the science of making things better[9]); Saarinen is a philosopher whose interest has been in bringing philosophy to everyday contexts and to organizational life. Like Hämäläinen in the decades of his tenure at Helsinki University of Technology, Saarinen has worked extensively with engineering organizations such as Nokia.

Engineering thinking is based on the idea of change. Make X work, it says; and improve upon what doesn't work. You use your rationality and creativity in order to bring about workable solutions to a concrete reality. You celebrate success even when you do not know exactly why something that works does work. Thus, for an engineer's mindset, a system that works comes first, understanding and explaining why it works comes only second.

Similarly, a kiss or a warm laughter, an apology or an uplifting glance might resolve a tricky situation in a relationship. For the mindset of a master-of-the-everyday, a system that works comes first, understanding why it works comes only second.

Such was our starting point. We were saying: let's allow *the system's working* be the guiding light; let's focus primarily upon the emergence of a human system instead of focusing upon our cognitive maps of that emergence.

And we assumed that human beings inherently do just that, as part of their intelligent life-orientation.

Pitfalls of Systems Thinking

The Systems Intelligence perspective is radical because

- It wishes to account for an individual's fundamental ability (intelligence) in a way that does not conceptually presuppose the subject-object-distinction, but seeks to connect her with a situation, context and other people's realities – a system - considered as primary as the subject herself;

- It wishes to account for an individual's non-rational, non-propositional and non-cognitive capabilities, such as instinctual awareness, touch, "feel" and

sensibilities at large, as capabilities that relate the subject intelligently to system (the situation, context, other people);

- It explicitly seeks out the upscale dimension of life, assuming human flourishment, magnificent success, uplift and emergence to be fundamental human realities rather than mere positive exceptions.

A key contrast to Systems Thinking lies in our *refusal to take the outsider's view* to the systems which are addressed. Causal loop diagrams, for instance, are not as useful as they are in Systems Thinking. The primary situation is one where the individual identifies herself to be in the loop and not to have a chance to step outside the loop to reflect it in isolation, the Systems Intelligence approach says. She does not necessarily know and perhaps will not know exactly what the loop is, and yet that is the context of her actions and of potential flourishment. How can she do it intelligently? How can a human being act intelligently, indeed act magnificently, in contexts, situations, environments and among other people – in systems – when *a veil of uncertainty is always present*? What can intelligent choice towards flourishment mean when you cannot step aside and sort out the options and their systemic impact? These are the key questions of the Systems Intelligence approach.

Our conviction is that human beings *do possess* such systemic intelligence. We believe people do own a systemic route and an almost-miraculous access to the realm of flourishment. People are intelligent creatures, and more so than is sometimes appreciated. Positive reciprocity works, can bring about wonders, and its system dynamics is intuitively appreciated by all of us. Let's focus on that! The point is not so much to teach people something new but to awaken a competence they already have, and have applied all their lives.

Systems Intelligence movement is out there to help people excel further in something they have exercised already, often with considerable success.

Optimism for Change

Change starts somewhere. It might emerge from something incremental, marginal, even trivial. And yet it might amount to a huge restructuring of the fundamental aspects of the entire system – because of the leverage created by

> change in the way people experience other agents of the system as a result of a small but significant change in the other's behavior;

> change in the way people experience their own possibilities of acting within the system as a result of a small but significant change somewhere in the system;

> change in the way people experience the likely structure of the system in the longer run.

When Ms. Rosa Parks refused to give her seat to a white man in a Montgomery city bus in 1955, most people had not heard of Rosa Parks, considered the bus systems a technical matter, did not perceive the city of Montgomery as anything particularly significant, and ruled out as indifferent the question of a particular bus seat on a particular bus leg. But as Rosa Parks was arrested the marginal incident caught fire, created an avalanche that eventually reached epic proportions. Change was on the way to reshaping the entire system of race distinction in the most powerful country in the world.

Our philosophy of change is optimistic because of the overall view we have of people's beliefs and the functioning of the human internal system. Our conviction is that many of the core beliefs of people around us do not show up in their actions. The actions reflect the assumed nature of the current system. People have adjusted to *what they believe is the system* – e.g. to the way people regard "negroes". But when the system is shaken, the latent beliefs might trigger a revolution, spreading like an epidemic. Given a small but critical change in the system, deeply held aspirations might suddenly leverage, adding exponentially to the momentum.

Beliefs are distinctive in having a fundamentally ephemeral essence. For Systems Intelligence, this is a tremendous possibility as people's beliefs affect their actions and therefore other people.

Beliefs are distinctive in having a fundamentally ephemeral essence. They can be changed dramatically, massively, instantaneously and due to an incremental input. People might get excited, might start believing in the future, might start to trust and respect one another – as a result of something relatively small and mundane. For Systems Intelligence, this is the key: small changes that transform something major, as a kind of butterfly-effect in the context of our life systems.

Systems Intelligence focuses on changes as leveraged by the dual force field of the systemic and movable nature of the human mental world and the systemic nature of the context, situation and people's behaviors around us.

Systems Intelligence takes the idea of people's internal and movable world utterly seriously. Unlike many forms of rationalism and objectivism, we do not fear the subjective or the emotional, the experiential or the phenomenological – indeed we embrace them. Therein lies the source of emergence.

One might be massively misguided regarding what the others truly believe and *what might move them towards flourishment. Our interactional patterns, modes of reciprocity, adjustment tactics and proactivity strategies might be utterly misplaced and underutilized.* There might be a systematic flaw in the way a group of agents experiences the subjective worlds of the others, and the possibilities of reciprocity systemically hiding among that group of people. The "reality" we form together might stand on a quicksand, seem like a castle, and at the same time destroy the higher possibilities of life.

Systems Intelligence is based on a principle of dynamic humbleness and optimism for change, which acknowledges that my perspective of others might be drastically mistaken, particularly regarding what the true aspirations of those others might be. An incremental and seemingly trivial change in my behavior might be a significant change *to the better* in the eyes of another, might intervene with *her* beliefs regarding me, might lead her to appreciate suddenly *what life is all about*, and thus trigger a chain of changes in the actual behaviors in each of us and in the system we form together.

To the extent there is a veil of ignorance in our beliefs regarding the aspirations others in the system, there also is a hidden possibility of a cumulative enrichment and improvement through reciprocity. Fresh possibilities of flourishment are always there, simply because most forms of interaction have *not been tried*. Instead, our patterns of interaction are highly standardized, often low in emotional energy[10], and typically hide the upscale options. Systems Intelligence is an approach of realistic hands-on

optimism, based on acknowledging the possibility of upward-spiraling movements through human reciprocity.

This sort of leverage thinking is often bypassed as sort of idealism and a form of wishful thinking. Yet it amounts to an appreciation of some of the most powerful moments of most people's lives – those moments when one's actions flow with the situation, when people feed each other, when positivity rules, the upscale aspects of life are eminent and *the system flies and we fly with the system*.

Adapting terminology from "Systems Archetypes", you could reconstruct many of your best moments in life – or the history of the Civil Rights Movement in the U.S. – in terms of *the Systems Intelligence Archetypes* of "Fixes that Fire", "Sharing the Burden" and "Miracle of the Commons".

Marshall Mannerheim Enters the Stage

As Finland was fighting for its independence against Stalin's Red Army during the Second World War, eventually successfully, the Finnish Commander-in-Chief Marshall Mannerheim sometimes visited the front. A tall cultivated man in his eighties and in excellent physical shape Mannerheim was a towering figure, respected by all Finns as a man of mythical proportions.

When walking in a trench Mannerheim might stop and take out a cigarette, his junior adjutant at the time Colonel Rafael Bäckman told Saarinen in 2006.

- A cigarette?

- A cigarette. This offered a possibility for a soldier standing nearby to come up and offer light for the Commander-in-Chief. After the cigarette was lit, Mannerheim would talk informally with the soldier, typically about his home and loved ones.

Consider this as an example of Systems Intelligence. Suppose you are a soldier out there in a trench and observe your charismatic Commander-in-Chief approaching together with his entourage. How are you to strike a sufficiently impressive pose? You are trapped in a system that hardly allows you to breath. And yet a small, incremental intervention – a cigarette lighting – can change it all.

Systemic Leverage

Our assumption is that people read and experience situations from a systemic point of view and interpret any given context in systemic terms. Then they adapt to the system, operate from the system, with respect to it and towards it. But obviously the system could be different from what people believe it to be.

As a result, there is a tremendous leverage built in any human context, if only people would interpret the system as having changed. Even if it hasn't yet changed, it will change, when sufficiently many people believe it has changed.

Here lie the chances of systemic intervention. In human contexts, almost anything can serve potentially as a signal of *a change for hope*. A clean subway car can become a powerful symbol of an entirely new era.

The interpretation of an event, incident or a change as symbol in the human context is highly variable upon human factors be those subjective, intuitive, interpretative,

emotional etc. Interpretation is everything, creating a realm of possibility. And sometimes people grasp that possibility, personally and powerfully.

The catch for a rationalist lies in the lack of clear-cut predictability. In the context of human change the logic typically is not "If X then Y". One needs to be sensitive, situation-conscious, emotionally alert, sufficiently distanced and sufficiently connected; one needs to be fine-tuned to the non-rational undercurrents in the context in order to make full use of the situation *in order to make things work and the context to flourish*. It is such sensitivity that Systems Intelligence wants to elicit.

People are existential creatures that thrive on meaning. As a result, the most forceful forms of systems intelligent system intervention are likely to be ones that touch internally upon basic human aspirations, especially:

1. A subject's sense of worth and desire to be respected;

2. A subjects desire to feel connected to the company of others;

3. A subjects desire to feel connected with something meaningful.

A systems intervention that touches upon a person's basic existential needs is likely to transform into a change factor through the internal system of that person.

Rose Buying Finns

Most Finnish men do not buy roses for their wives spontaneously on normal weekdays. A *non-rose buying system* is in place, creating behaviors that generate the lack of rose buying. The system is invisible, as part of the accepted reality. A man that buys a rose is experienced as having made a choice but a man that doesn't is not experienced as having chosen not to buy a rose.

It is almost as if some higher authority governs the rose buying behaviors of all these non-rose-buying men.

The system, no doubt, is in place partly because of the experiences each particular man in his seasoned marriage has undergone in the course of years. The wife has changed, he feels, and is becoming increasingly negative. She is unenthusiastic about life. She never puts lipstick on at home just for him. The wife seems overtly pragmatic. Not much of a spark left. He reacts, pushing down his more romantic ideas and gestures, a dimension where he was never that great to start with.

But the same is true of the wife: the two are caught in *a system of mutually holding back in return and also in advance*. The two have created a system and now the system rules.

Consider the rose buying as a generative metaphor for micro behavioral actions that would touch the other positively, strengthen her faith in life, optimism, hope and sense of worth. One would expect work life, where faith in life is power and creates momentum, to be unconditionally alert to such systems of rose buying, i.e. to systems of generating faith-in-life, optimism and everyday-strength in people particularly in as much as that can be done *totally free of cost*.

This turns out not to be the case. Instead, systems of holding back in return and in advance rule everywhere:

*   Most managers want to support their team members more than they currently do. Most team members would want to get more support from their managers.

Yet more support does not result. There seems to be *a lack-of-support generating system* in place.

- Most speakers would like to give their best in a presentation. People attending the presentation would benefit most if the speaker would be at her best. But the speaker does not give her best, the audience does not receive the best. There seems to be *a poor presentation generating system* in place.

- Most people would benefit from generosity in everyday situations (showings of interest, presence, human warmth, politeness, considerateness, gratefulness, credit-givingness, attentiveness, etc.) Most people would themselves like to provide such gestures more than they now do. But generosity is scarce. There seems to be *a non-generosity generating system* in place.

Systems of Holding Back are a key form of human interaction. They trap us from everywhere – from within and from without.

Systems of holding back are the single most important key to life-decreasing, reciprocity-trivializing and vitality-downgrading mechanisms in human life.

It requires intelligence just to adjust to them.

Higher intelligence is needed if you want to overcome the system – a possibility that the Systems Intelligence approach wants to highlight.

Window of Opportunity

Systems Intelligence is based on the insight that *systems of holding back prevail and lurk everywhere, and yet do not tell the whole story.* Fear rules over courageousness, ungratefulness over gratefulness, taking over giving. And yet there is more to humans than meets the eye – more that is good.

An entirely different story is hiding beneath the surface – and it could be triggered out by a marginal change. This is because people are not likely to reveal their discontent with what they believe is unchangeable. But suppose hope returns, excitement is back, the realization that a seemingly unchangeable system actually is man-made, a construction, an artifact from top to bottom – entirely based on human choice. The system can be changed, in fact is likely to change, and I can be part of that change.

Saarinen's initial interest in Systems of Holding Back grew out of his philosophical lecturing as a desire to find examples of choice people subjectively could not deny they had. Saarinen was led to studying small incremental micro behaviors that would benefit others, would not require any material resources, and yet fail to materialize. It was interest in the failure of a seasoned couple to hold the other's hand in a shopping mall, or the failure of a professional to lean forward paying attention to an expert colleague giving a presentation, or the failure of a manager not to start a meeting with a few informal, credit-giving lines.

Why is there a universally accepted *people's movement* not to give credit, say? Why a *people's movement* not to pay attention at meetings? The lack of positive micro behaviors reveals a complement – the domain of micro actions that could have been.

That domain is huge – and a source of tremendous leverage if perceived in systemic terms.

Particularly when approached using examples drawn from marriage, it has turned out to be remarkably easy for people of various ranks and files, age and education backgrounds, to gain insight into *their own personal holding back behaviors* and to *the unintended systemic consequences* created thereby. Systems of holding back strike to the core of our everyday living, and to the core of all organized life, in a way that is easy for people to comprehend intuitively and personally.

Systems of holding back are a route to appreciating *the constructed nature* of our everyday modes of being. As soon as that element is appreciated, the fundamental possibility of human choice enters the picture – choice as conceived as a personal possibility on the level of *my everyday micro behaviors*.

Personally perceived choice resulting in taking an action is a key idea in Systems Intelligence. The point is to highlight choice in order to pave the way to an empowered practice of change. To this effect, it is essential to discuss behaviors regarding which the agent indisputably does have a choice, even when judged by her own perhaps distorted and biased internal belief system.

Intellectual complexity of the choice is very often not the issue. As a result, loop diagrams are not likely to be of much use. What is the bottleneck if not lack of knowledge? Our answer is: *human self-centeredness, lack of sensitivity, and disbelief in the human potential in us and around us*.

The egoistic, cynical subject views a system cold from outside assuming to find an objective reality. He might be effective in the short run in his efforts to manipulate the system from outside. But the alternative is to step inside and open up the system and open up oneself – working openly, sensitively, attentively, with systems intelligence. The alternative is to make the system flourish.

The sensitive, the instinctual, the contextual, the situational, the atmospherical, the emotional and the subjective elements and capabilities are back – they reside right there at the center of human individual and collective action, organizational behavior and systemic change.

Why Systems Thinking Projects Fail

Senge, in the updated edition of *The Fifth Discipline* openly acknowledges that building learning organizations has turned out to be significantly more difficult than what he envisioned in 1990. Likewise Jeremy Seligman[11], describing his experiences of building a Systems Thinking (ST) culture at Ford, writes bluntly: "sometimes it seems doubtful that ST will ever gain the critical mass required to make it an integral part of how major corporations practice strategic thinking."

It is here where we believe the Systems Intelligence approach points the way forward.

First observe why Systems Thinking projects can easily fail. In as much as a ST project aims at increasing people's knowledge of an organization's systemic structures, teaching people the use of systemic tools such as loop diagrams and stock-and-flow computer models, *none of that ST learning need touch their everyday holding back behaviors*, or the holding back systems generated by such behaviors.

Yet it is clear that a learning organization can never flourish if it remains a system of holding back. But systems of holding back lurk at the human level and at the level of people's micro behaviors, in the dimension of the mundane, they are in many cases

intellectually trivial, often seemingly invisible hiding as they do behind the curtain of custom and conformity, and generally not approachable from outside in.

ST projects fail, because people need not change their *micro behaviorally relevant* modes of thinking, behaviors, mental models and dialogical patterns as a result of increased *knowledge* of various aspects of Systems Thinking or of the systems structures involved. But micro behaviors generate systems of holding back, creating a hidden, crushingly powerful counterforce to the Systems Thinker's well-intended and rationally sound effort to launch ST initiatives in order for the organization to "grasp of the big picture" and to "understand the long-term effects".

Becoming More Systems Intelligent

The learning organizational movement has struggled with the fact that as ST programs are driven into organizations, surprisingly little changes. "Problems may get solved, but the organization will be no smarter", Peter Senge puts it in the updated edition of *The Fifth Discipline.*[12]

We believe what is called for is a movement towards the individual, the subjective, the emotional and the magical middle ground between subjective, emotional and internally driven individuals. This is what the Systems Intelligence perspective attempts to accomplish. As a result, we believe the Systems Intelligence approach offers a way forward from some of the traps the learning organization movement seems to have fallen into. At the same time, the Systems Intelligence approach builds upon Senge's original insight regarding the significance of the systems perspective.

The Systems Intelligence perspective has already proven its iconic ability to stimulate learning. In the context of lectures and seminars, we have observed that people feel strongly encouraged to develop further a capability they already possess, more so than to learning cognitively new material they might feel is abstract.

The concept itself points the way. It is heuristically energetic. In most cases only a few lines of explanation are needed in order for people to feel ready to move ahead with the concept and apply it to their own situations. The word "system" encourages a hands-on attitude: it suggests something that is constructed and man-made, something that is working – and thus could work better. Embedding ourselves and other people, the very fundamentals of our co-operative and interactional practices within that conceptual frame highlights the possibilities of new and creative productive actions.

Learning together is important – but acting together for flourishment even more so. That is the possibility the Systems Intelligence approach wishes to highlight.

In individual separate windows:

Systems Intelligent Organization

- Empowers people to share their mental system models of the organization and to consider the effects of their own actions on the whole

- Fosters and sustains inquiry mode and reduces advocacy

- Keeps fear factors down

- Helps people to be responsive to flourishing initiatives

- Builds trust in the good will of others

- Sees that its production capacity is not restricted to the measurable variables but is extended to the world of emotions and well being

- Elevates innovativeness by an environment where emotional variables do not limit performance

Five Levels of Systems Intelligence

1. **Seeing oneself in the System** – Ability to see oneself and ones roles and behavior in the system. Also through the eyes of other people and with different framings of the system. Systems thinking awareness.

2. **Thinking about Systems Intelligence** – Ability to envision and identify productive ways of behavior for oneself in the system and cognitively understanding systemic possibilities emerging from one's choices.

3. **Managing Systems Intelligence** – Ability to personally exercise productive ways of behavior in the system.

4. **Sustaining Systems Intelligence** – Ability to continue and foster systems intelligent behavior in the long run.

5. **Leadership with Systems Intelligence** – Ability to initiate and create systems intelligent organizations

Systems Intelligent Leader

Strives to learn and reach Level 5

- Sees herself in the system with a mission to develop a Systems Intelligent Organization

- Is aware of the human perspective and of the possibilities of human reciprocity

- Operates within the visible system and manages the emotional system simultaneously

- Is not held captive by the mechanistic perspective

- Identifies and eliminates structural systems dictatorships that alienate people from their own choices.

- Recognizes Systems Intelligence as an iconic personal growth challenge and a success asset

Endnotes

1 The introduction of the concept of Systems Intelligence and the seminal essays on it were first presented in Finnish in 2002 and they appeared in the report series of the Systems Analysis Laboratory. In 2004 the first set of essays in English was published in Raimo P. Hämäläinen and Esa Saarinen, editors, *Systems Intelligence – Discovering a Hidden Competence in Human Action and Organisational Life* (Helsinki University of Technology: Systems Analysis Laboratory Research Reports A 88, 2004). The key texts therein are the *Introduction* and *Chapter 1: Systems Intelligence: Connecting Engineering Thinking with Human Sensitivity* by Esa Saarinen and Raimo P. Hämäläinen.

2 For the MI theory see Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983/1993) and his book *Intelligence Reframed: Multiple Intelligences of the Twenty-First Century* (New York: Basic Books, 1999).

3 Peter M. Senge, *The Fifth Discipline* (New York: Doubleday, 1990, updated edition 2006).

4 See e.g. Kim S. Cameron, Jane E. Dutton, and Robert E. Quinn, editors, *Positive Organizational Scholarship* (San Francisco, CA: Berrett-Koehler Publishers, Inc., 2003).

5 See e.g. C.R. Snyder and Shane J. Lopez, editors, *Positive Psychology* (New York: Oxford University Press, 2002).

6 See P. Reason and H. Bradbury, Editors, *Handbook of Action Research - Participative Inquiry and Practice* (London: Sage Publications, 2001).

7 The related essays are in the publication in note 1. The home pages of our research group provide free access to all the materials, essays and slides. www.systemsintelligence.hut.fi

8 The article by the Editor-in-Chief Reetta Meriläinen entitled "There would be a standing order for Systems Intelligence" ("Systemiälylle olisi kestotilaus"), was published in the daily newspaper *Helsingin Sanomat* on July 16, 2006.)

9 See "Operations Research: The Science of the Better" website http://www.scienceofbetter.org

10 On emotional energy, see Randall Collins's important *Interaction Ritual Chains* (Princeton: Princeton University Press 2004)

11 Jeremy Seligman, "Building a Systems Thinking Culture at Ford Motor Company", *Reflections* Vol. 6, No 4/5.

12 Peter M. Senge, *The Fifth Discipline* (New York: Doubleday, updated edition 2006). p. 332.