The Karlskrona Manifesto on Sustainability Design

This is a draft working version of the manifesto arising from the RE4SUSY workshop at RE2014 ***for initial review.*** *A bit of background is explained here.*
We are currently revising, consolidating and extending this initial prototype. We very much welcome thoughts on the content, structure, elements, impact, etc!
Please take a few minutes *to respond to a quick* ***survey*** *asking what you think about it HERE!*
There is a structured google document with space for ***free-form comments*** *HERE.*
Tell us what you think!
-- version 0.2, August 28 2014

Introduction

As software practitioners and researchers, we are part of the group of people who design the software systems that run our world. Our work has made us increasingly aware of the impact of these systems and the responsibility that comes with our role, at times where information and communication technologies are changing the face of the world. We struggle to reconcile our concern for the planet Earth and society with the technical work that we do. Through this work we have come to understand that we need to "redefine the narrative" on sustainability and the role it plays in our profession.

1. Sustainability - the capacity to endure - is at its heart a systemic concept with a holistic nature.
2. Sustainability has to be understood on a set of dimensions, of which we know five - social, environmental, economic, human, and technical
3. Any system has 1st, 2nd and 3rd order effects.
4. These effects play out in all dimensions of sustainability over multiple timescales.
5. Sustainability is fundamental to our society. The current state of our world is unsustainable in more ways that we often recognize.
6. Technology is part of the problem and part of possible solutions. It can push us towards growing consumption of resources, growing inequality in society, and lack of individual self-worth. But it can also create communities and enable thriving of individual freedom, democratic processes, and resource conservation.
7. Software in particular plays a central role in sustainability because of its effects as a driving factor in dematerialization, as a leverage point and change driver. These effects can be positive or negative.
8. As designers of software technology, we are responsible for the consequences of our designs. Design is the process of understanding the world and articulating an alternative conception on how it should be shaped, according to the designer's intentions. Through design, we cause change and shape our environment.

We recognize that

there is a rapidly increasing awareness of the fundamental need and desire for a more sustainable world, and there is a lot of genuine desire and goodwill - but this alone can be ineffective unless we come to understand that...

There is ...	**whereas**
A narrow perception of sustainability that frames it as protecting the environment or being able to maintain a business activity	As a systemic property, sustainability applies to a complex whole. Business activity and the natural and social environment are interdependent and connected. You can't have sustainability in one dimension without the other, for instance, you can't have a sustainable economy without a sustainable environment.
A perception that sustainability is a distinct discipline of research and practice with a few defined connections to software	Sustainability is a pervasive concern that translates into discipline-specific questions in each area it applies.
A perception that sustainability is a problem that can be solved, and that our aim is to find the "one thing" that will save the world.	It is a "wicked problem" - a dilemma to respond to intelligently and learn in the process of doing so; a challenge to be addressed, not a problem to be solved. "It is here to stay".
A perception that there is a trade-off to be made between present needs and future needs, reinforced by a common definition of sustainable development, and hence that sustainability requires sacrifices in the present for the sake of future generations	It is possible to prosper on this planet while simultaneously improving the prospects for prosperity of future generations. There does not have to be a conflict: we want to meet present AND future needs!
A tendency to overly discount the future - in fact, the far future is discounted so much that it is considered for free (or worthless). Discount rates mean that long-term impacts matter far less than current costs and benefits.	The consequences of our actions play out over multiple timescales, and the cumulative impacts may be irreversible. We need a focus on long-term thinking.
A tendency to think that taking small steps towards sustainability is sufficient, appropriate, and acceptable.	Incremental approaches can end up reinforcing existing behaviours and lure us into a false sense of security. However, current society is on a path that is so far from sustainability that deeper transformative changes are needed.
A tendency to treat sustainability as a desirable quality of the system that should be considered once other priorities have been established.	Sustainability is not in competition with a specific set of quality attributes against which it has to be balanced - it is a fundamental precondition for the continued existence of the system and

	influences many of the goals to be considered in systems design.
A desire to identify a distinct completion point to a given project, so that success can be measured at that point, with respect to a pre-ordained set of criteria.	Measuring success at one point in time fails to capture the impacts that play out over multiple timescales, and measuring a point in time tells us nothing about long-term success. Criteria for success changes over time as we experience those impacts.
A narrow conception of the roles of system designers, developers, users, owners, and regulators and their responsibilities, and there is a lack of agency of these actors in how they can fulfill these responsibilities.	Sustainability imposes a distinct responsibility on each one of us, and that responsibility comes with a right to know the system design and its status, so that each participant is able to influence the outcome of the technology application in both design and use.
A tendency to interpret the codes of ethics for software professionals narrowly to refer to avoiding immediate harm to individuals and property.	It is our responsibility to address the potential harm from the 2nd and 3rd-order effects of the systems we design as part of our design process, even if these are not readily quantifiable.

As a result, even though the importance of sustainability is increasingly understood, in the majority of cases where **software systems** are created, they are done so unsustainably and often decrease overall sustainability instead of increasing it.

Thus, we propose the following initial set of principles and commitments.

Principles	**Commitments**
Sustainability transcends multiple disciplines	Working in sustainability means working with people from across many disciplines, addressing the challenges from multiple perspectives
Sustainability requires long-term thinking	Consider multiple timescales, including the long term Include longer-term indicators in assessment and decisions
It is possible to meet the needs of future generations without sacrificing the prosperity of the current generation.	Innovation in sustainability can play out as decoupling present and future needs. By moving away from the language of conflict and the trade-off mindset, we can identify and enact choices that benefit both present and future.
Sustainability is systemic	Sustainability is never an isolated property. Systems thinking has to be the starting point for the transdisciplinary common ground of sustainability

Sustainability requires action on multiple levels	Seek interventions that have the most leverage on a system and consider the opportunity costs: Whenever you are taking action towards sustainability, consider whether this is the most effective way of intervening in comparison to alternative actions (leverage points).
Sustainability applies to both a system and its wider context	There are at least two spheres to consider in system design: ● the sustainability of the system itself, ● how it affects overall sustainability of the wider system of which it will be part of. It is often useful to distinguish multiple systems during design, to consider the impact on each of them, such as the designed system vs. its production system and usage systems.
System visibility is a necessary precondition and enabler for sustainability design	Strive to make the status of the system and its context visible at different levels of abstraction and perspectives to enable participation and informed responsible choice.

What does this mean for these areas of interest?

We have hardly started the right questions. We invite you to engage in an ongoing conversation.

- Software Engineering
    - an enabler and primary driver of dematerialization
    a. driving consumption patterns
    b. ability to collect and communicate information
    c. Sometimes, the system the user wants and the system you should build are vastly different.
    d. ...
- Requirements Engineering
    - key leverage point
    - ethical obligation to question user needs and shaping people's expectations
    - Creatively use sustainability concerns and apparent conflicts as drivers for innovation.
    - There is often a perception that information should be provided selectively to improve task efficiency, whereas *social sustainability -> participatory design -> system visibility*
    - ….
- Information Systems
    - information sustainability
    - end-of-life considerations
    - ...
- Systems Engineering?
- HCI…
- ….

Signed,

- Christoph Becker
- Ruzanna Chitchyan
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- Steve Easterbrook
- Martin Mahaux
- Birgit Penzenstadler
- Guillermo Rodriguez-Navas
- Camille Salinesi
- Norbert Seyff
- Colin Venters
- *If you were at the re4susy workshop and want to be added to this list, please let us know!*
- *Coral Calero*