

Building Social Sustainability into Software: Case of Equality

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Overview

- What is Social sustainability?
- Principles of Sustainability Design
- Values as drivers of sustainability design
- Equality Case study
- Conclusion

What is Social Sustainability?

- Social sustainability
 - “a positive and long-term condition within communities and a process within communities that can achieve and maintain that condition” (Willis, McKenzie and Harris, 2009)
 - related to access to services and opportunities that promotes “longer life expectancies, less crime, stronger civic engagement and more robust economic vitality” (Landorf, 2011)

Few Social Sustainability Indicators

- How can we see if there is social sustainability?
 - Systematic Literature Review led to indicators*:
 - health and safety
 - quality of working conditions
 - impact on employment
 - education and training
 - knowledge management
 - innovation potential
 - customer acceptance and societal product benefit
 - social dialogue
 - social stability
 - ... about 600 of these
 - Nothing to do with software per se !?

* Social Sustainability Indicators for Software: Initial Review, RE4SuSy 2014, <http://ceur-ws.org/Vol-1216/paper5.pdf>

Software and Social Sustainability

- Software can support positive conditions or undermine them
 - Family support system⁺
 - Update on illnesses and available vaccination
 - Arrange nurse visits for health checks, etc.
- But it is not so simple
 - Traffic Management system⁺
 - Immediate impact: improves traffic flow, reduces travel time, cuts emissions
 - Longer term impact: more people buy cars, more traffic, longer times of travel, increased emissions
 - 2nd and 3rd order impacts complicate the picture

⁺ Evidencing Sustainability Design through Examples, RE4SuSy 2015 http://www.cs.le.ac.uk/people/rc256/RE4SuSy2015_evidencingSustainability_CameraReady.pdf

Karlskrona Principles of Sustainability Design[§]

<http://sustainabilitydesign.org/karlskrona-manifesto/>

- ...is systemic - never an isolated property
- ...has multiple dimensions
- ...transcends multiple disciplines
- ...is a concern independent of the purpose of the system
- ...applies to both a system and its wider contexts
- ...requires action on multiple levels
- System visibility is a necessary precondition and enabler for sustainability design
- ...requires long-term thinking

[§] Sustainability Design and Software: The Karlskrona Manifesto, ISEC SEIS 2015 <http://www.cs.le.ac.uk/people/rc256/Beckeretal-ICSE2015.pdf>

Moreover

- Scope impact:
 - Systems are developed for an organization but can affect the world at large
 - Sustainable for organisation *does not mean* sustainable for world
- Stakeholder availability:
 - Those affected by system in longer term will not know of such effects, or may even not be born at the time of its development

Values as Requirements Drivers[^]

- Base RE on values that promote Social Sustainability
 - Elicit value patterns for the areas to be supported
 - Review stakeholders to seek out those relevant to the pattern
 - Ensure requirements that embody these values are elicited and documented for each relevant stakeholder category

[^]Building Social Sustainability into Software: Case of Equality, REPa 2015, <http://www.cs.le.ac.uk/people/rc256/REPa2015.pdf>

Values as Drivers: Example of Equality[^]

- Equality is category of social sustainability*
- Equality is not about software
 - It is defined as the right for all members in a society to enjoy living and getting access to services and facilities without being discriminated because of their origin, believes, position, or (dis-)abilities (Equality and human rights commission, UK)

[^]Building Social Sustainability into Software: Case of Equality, REPa 2015, <http://www.cs.le.ac.uk/people/rc256/REPa2015.pdf>

* Social Sustainability Indicators for Software: Initial Review, RE4SuSy 2014, <http://ceur-ws.org/Vol-1216/paper5.pdf>

Equality Indicators

- Indicators*:
 - Fair salary
 - Fair competition
 - Equal opportunities
 - Discrimination
 - Fair distribution of services
 - Access to services and resources
 - Decision making power of people
 - Gender equality
 - Social equity (resources and opportunities distribution)

Equality value pattern

- Based on generic model of sustainability (Penzenstadler, B. and H. Femmer, 2013)
 - Dimensions: (i.e., economic, technical, environmental, individual and social)
 - Values: moral or natural good, such as human health
 - Activities: actions supporting the value achievement.

Socio-cultural equity value pattern

- Community members are to be allowed to equally utilize community services regardless of differences (age, gender, race, religion, etc.)
- In terms of software applications, this can be related to different stakeholders accessing the system through different technologies and with different abilities.

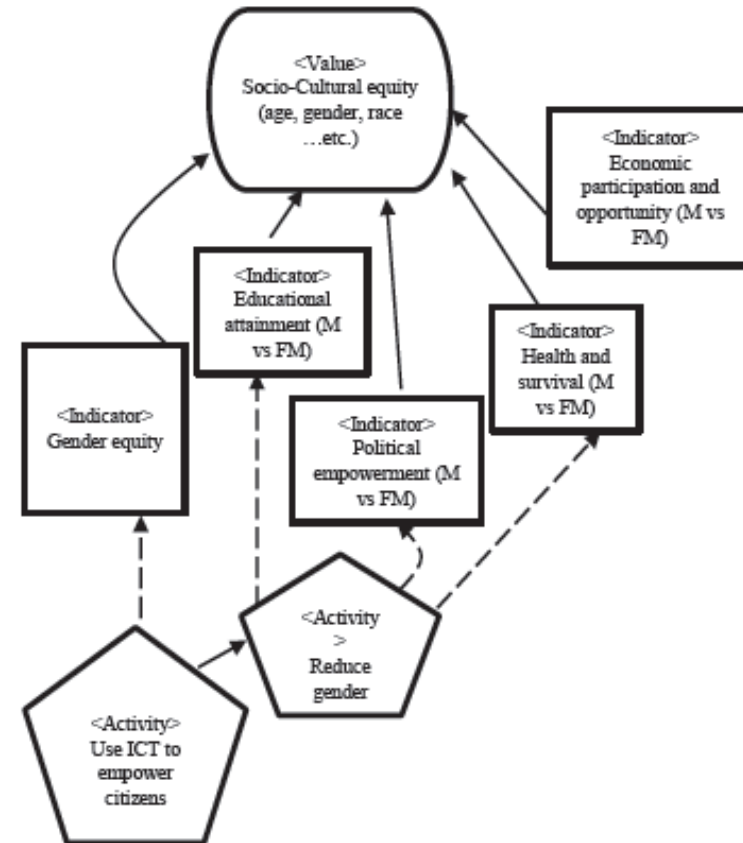


Fig. 2. Socio-cultural equity value pattern

Case study: Health watcher

- Stakeholders:
 - the public users (citizens)
 - the health officers (employees)
 - the organization involved in a complaint

Socio-cultural equity value

- All stakeholders should be allowed to use the system regardless of differences
- Requirements:
 - RQ1. The system should be available for users with different devices (desktop, tablets, mobile, kiosks), different operating systems (Android, iOS, Mac, Windows)
 - RQ2. Information should be displayed in different format (audio, video, text..) to support blind and visually impaired users...

Achieve social equality value

RQ11. The system should allow citizens to view health information.

RQ12. The system must allow health officers to view complaints.

RQ13. The system must allow health officers to refer and comment on complaints.

RQ14. The system must provide alerts to health care officers in case of no decisions/actions are associated to a complaint.

RQ15. The system must allow health care officers to view citizens health enquires.

RQ16. The system must allow health care officers to reply on citizens enquires.

RQ17. All complaints must be reviewed by an officer.

RQ18. Organizations who are blamed in a complaint should be allowed to view the complaint and comment/respond to it.