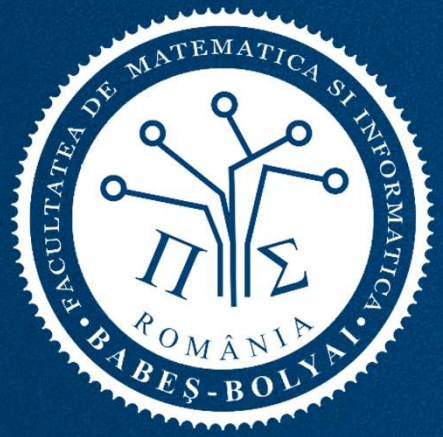
Software Sustainability Principles

MME8192 – Sustainable Software Engineering

Facultatea de Matematică și Informatică
Universitatea Babeș-Bolyai

https://www.edgemiddleeast.com/cloud/2021/11/25/shutterstock_184553570-1-1536x1024.jpg

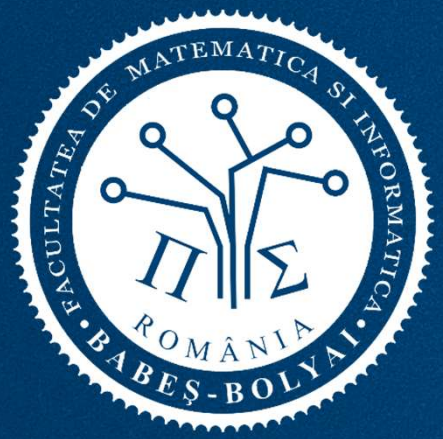


Software Sustainability (re)

Facultatea de Matematică și Informatică

Software Sustainability

- P. Lago, ***Sustainable software for a digital society*** (2017)
  - Sustainable software for a digital society (video)



Karlskrona Manifesto

Facultatea de Matematică și Informatică

Karlskrona manifesto for sustainability design

- cross-disciplinary initiative to create a common ground and develop a focal point of reference for the global community of research and practice in software and sustainability [Bek15]

- initiated at a working session at the Third Int. Workshop on RE for Sustainable Systems (RE4SuSy), held at RE'14, Karlskrona, Sweden

- a document to be used for effectively communicating key issues, goals, values and principles of sustainability design, as a basis for methods, reference models and tools

Karlskrona manifesto for sustainability design

Principles:

- P1: ***Sustainability is systemic***
  - *Sustainability is never an isolated property. Systems thinking has to be the starting point for the transdisciplinary common ground of sustainability.*
- P2: ***Sustainability has multiple dimensions***
  - *We have to include those dimensions into our analysis if we are to understand the nature of sustainability in any given situation.*
- P3: ***Sustainability transcends multiple disciplines***
  - *Working in sustainability means working with people from across many disciplines, addressing the challenges from multiple perspectives.*

Karlskrona manifesto for sustainability design

Principles:

- P4: ***Sustainability is a concern independent of the purpose of the system***
  - *Sustainability has to be considered even if the primary focus of the system under design is not sustainability.*
- P5: ***Sustainability applies to both a system and its wider contexts***
  - *There are at least two spheres to consider in system design: the sustainability of the system itself and how it affects sustainability of the wider system of which it will be part.*
- P6: ***Sustainability requires action on multiple levels***
  - Some interventions have more leverage on a system than others. Whenever we take action towards sustainability, we should consider opportunity costs: action at other levels may offer more effective forms of intervention.

Karlskrona manifesto for sustainability design

Principles:

- P7: ***System visibility is a necessary precondition and enabler for sustainability design***
  - The status of the system and its context should be visible at different levels of abstraction and perspectives to enable participation and informed responsible choice.
- P8: ***Sustainability requires long-term thinking***
  - We should assess benefits and impacts on multiple timescales, and include longer-term indicators in assessment and decisions.
- P9: ***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.

Karlskrona manifesto for sustainability design

- *Sustainability design in the context of software systems is the process of designing systems with sustainability as a **primary concern**, based on a **commitment to these principles**.*

- B. Penzenstadler, ***The Karlskrona manifesto on sustainability design*** (2019)

  The Karlskrona Manifesto on Sustainability Design (video)

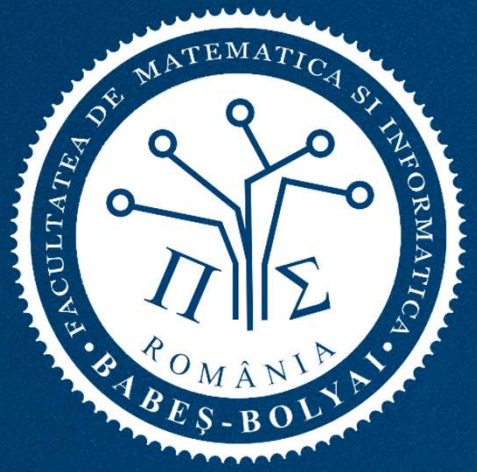
References

- [Bek14] Becker, Christoph. (2014). *Sustainability and longevity: Two sides of the same quality*?. Mental. 20.

- [Bek15] Becker, Christoph & Chitchyan, Ruzanna & Duboc, Leticia & Easterbrook, Steve & Penzenstadler, Birgit & Seyff, Norbert & Venters, Colin. (2015). *Sustainability Design and Software: The Karlskrona Manifesto*. 467-476. 10.1109/ICSE.2015.179.
  - Sustainability Design and Software: The Karlskrona Manifesto (pdf, researchgate.net)

- [Oye18] Oyedeji S, Seffah A, Penzenstadler B. (2018). *A Catalogue Supporting Software Sustainability Design*. Sustainability. 10(7):2296. https://doi.org/10.3390/su10072296

- [Oye20] Oyedeji, S., Penzenstadler, B. (2020). *Experiences from Applying the Karlskrona Manifesto Principles for Sustainability in Software System Design*. Proceedings of the 8th International Workshop on Requirements Engineering for Sustainable Systems.



FACULTATEA DE MATEMATICĂ ȘI INFORMATICĂ
UNIVERSITATEA BABEȘ-BOLYAI

Str. Mihail Kogălniceanu nr. 1
Cluj-Napoca, Cluj, România

www.cs.ubbcluj.ro