# Introduction to the idea

Open Source Good Practices - Yet Another Standard

- Standards are based on v-model
- No OSS project is strictly following v-model. 😱

- ASPICE or CMMI are main argumentation for quality management in Automotive
- Safety standards require a quality baseline to support safety claims.

- No existing quality standard matches established open source development practices!
(code-centric, CI driven and agile focus)

https://xkcd.com/927/
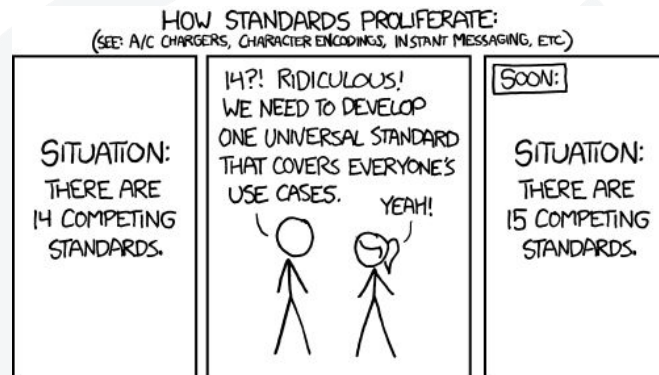
Open Source Good Practices - Goal

The goal of this project is to <u>evaluate and document</u> established <u>open source</u> development <u>best practices</u>

&

to provide an <u>assessment guide</u> for the user to <u>rate the quality</u> of open source projects.

Photo by <u>Paul Skorupskas</u> on <u>Unsplash</u>

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Open Source Good Practices - Overview

Phases
1. Determination of status quo
2. Definition of practices
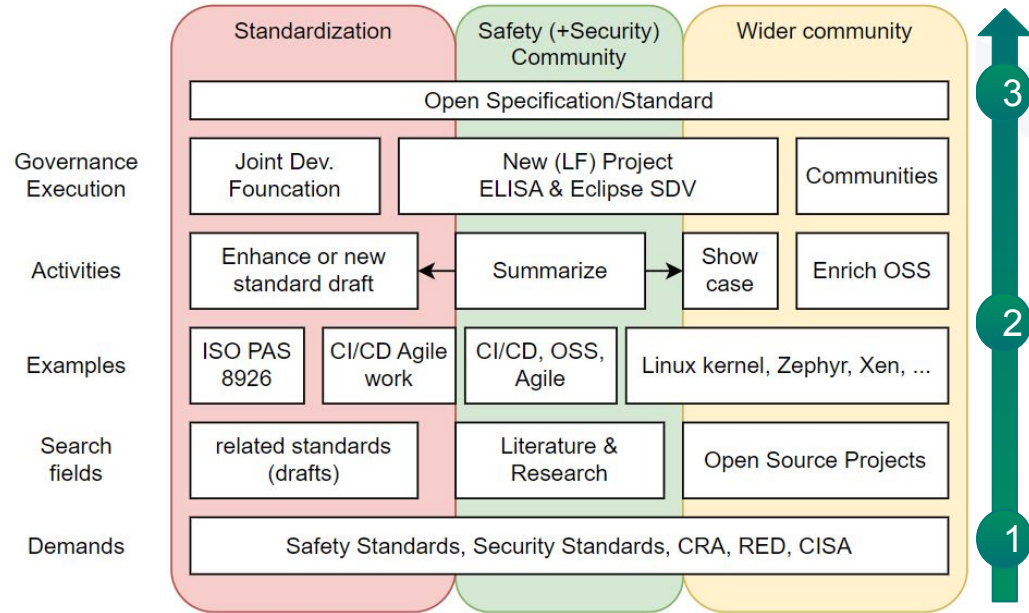3. Assessment of pilot projects

Contribution
- Academia, Public sector, OSS communities
- Industries: Medical, Robotics, Avionics, Automotive, Railway, Automation, … (SME to industry leaders)

Funding
- Funding to be clarified (PfP or by members?)

Reach out, if you are interested in this effort.

Press Release & Survey under preparation

	Standardization	Safety (+Security) Community	Wider community
	Open Specification/Standard		
Governance Execution	Joint Dev. Founcation	New (LF) Project ELISA & Eclipse SDV	Communities
Activities	Enhance or new standard draft	Summarize	Show case — Enrich OSS
Examples	ISO PAS 8926 — CI/CD Agile work	CI/CD, OSS, Agile	Linux kernel, Zephyr, Xen, …
Search fields	related standards (drafts)	Literature & Research	Open Source Projects
Demands	Safety Standards, Security Standards, CRA, RED, CISA		

Survey Sneak Peek

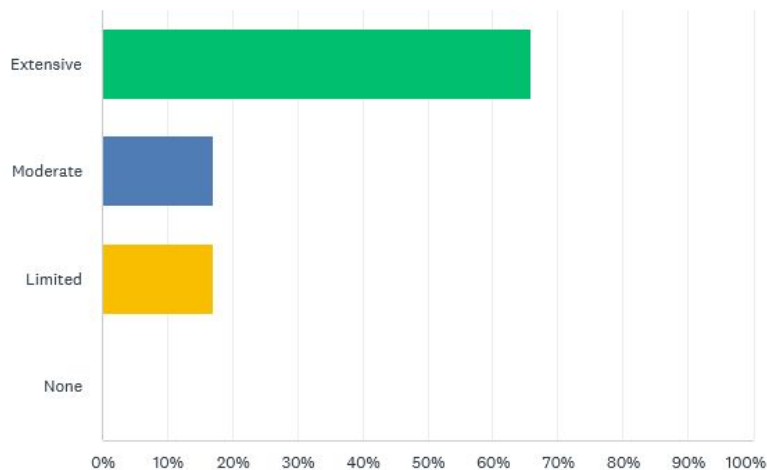# Some numbers

- ~88% responses from Industry/Company
  - Others: Academia, Pubic Sector, Open Source, Freelancer, …
- >50% from Automotive. ~10-12% from Robotics and Aerospace

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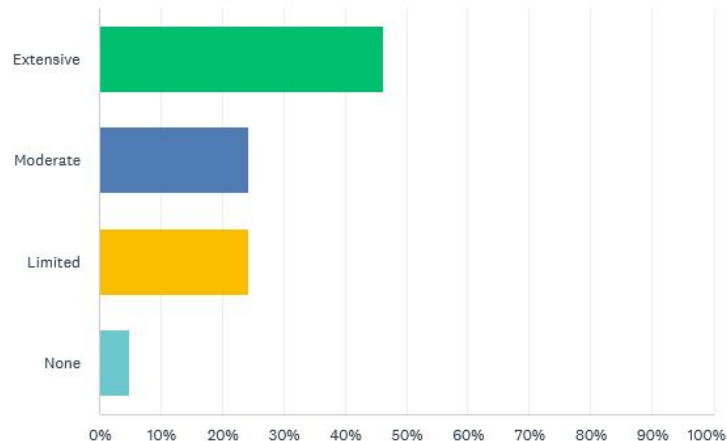**WORKSHOP**

Existing experience and expertise

Your experience with Open Source Software

Answered: 41   Skipped: 0

Your experience with quality management systems (like ASPICE, CMMI) or standards (like ISO26262, ISO21434, IEC61508)
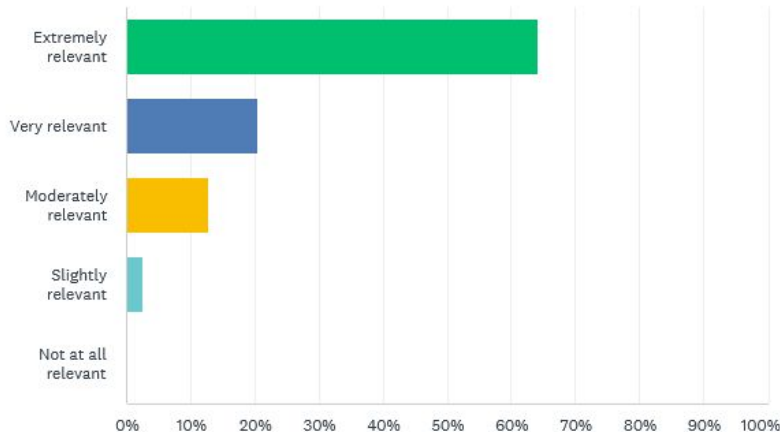
Answered: 41   Skipped: 0

Relevance of quality standards

How relevant is a "Quality Standards based on Open Source Best Practices" to your work or interests

Answered: 39   Skipped: 2

Areas of participation

- Most respondents prefer to review or participate in meetings/workshop

- 50% show interest in actively engaging in the working group

- 40% could imagine to pilot the standard

ANSWER CHOICES	RESPONSES
Participate in meetings/workshop	84.38%
Providing feedback on the proposed standard	93.75%
Reviewing draft documents	90.63%
Working actively in the working group	50.00%
Piloting the standard within your organization/project	40.63%
Funding or raising funds for the activities	15.63%

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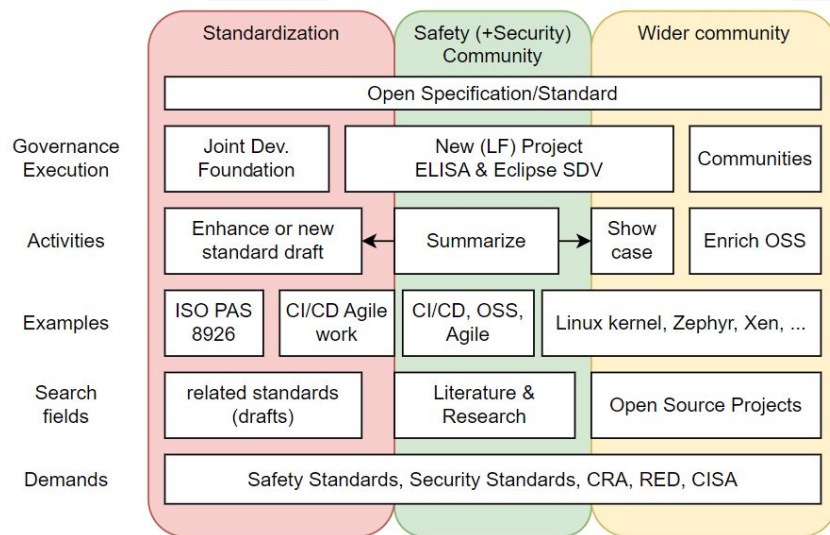
Brainstorming and directions during ELISA workshop

The proposed phases and key challenges

1) Analyzing existing OSS development practices
   a) Which standards already exist?
   b) Do they define KPIs that increase quality (i.e. reduce the probability of systematic bug)?
2) Identifying key performance indicators (KPIs), and
   a) Can we re-use KPIs from step 1)?
   b) Which Open Source project pilots should we consider to define KPIs?
   c) Which additional OSS projects shall we use to validate our KPIs?
3) Creating a framework to evaluate how well OSS projects align in front of the objectives safety & security standards as well as regulations.
   a) Are the defined KPIs suitable for supporting an automated framework?
   b) Can we consider a common framework implementation across (at least some) OSS projects?

Discussion points

- What to consider?
- Are we missing something?
  - Communities?
  - Technology?
- Is it over-engineering?
- What are the biggest risks?
- Which skill sets do we need to make it a success?

	Standardization	Safety (+Security) Community	Wider community
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Taking a poll on 3 questions!

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Which related standards do you know?

Which related standards do you know?

Brainstorming non-checked results to be analyzed further:

- ISO 5230,18974,21434
- DO-278C
- SOTIF (ISO/PAS 21448)
- MIL-STD0882
- ED-12C/ED-109A
- Iec 50716
- NASA-STD-8739.8B
- ISO 17978
- NPR 7150.2
- EN50128
- DOT/FAA/TC-15/27

- DO 178C
- Ece r137
- ISO 8926
- ISO/IEC 12207
- ISO/SAE 21434 standard: the importance of Threat Analysis and Risk Assessment (TARA)
- AS9100
- ISO9001

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Which related standards do you know?

Non-checked results from 3 different AI models needing further analysis.

- ISO/IEC 25010: Systems and Software Quality Models
- IEEE 12207: Standard for Software Life Cycle Processes
- ISO/IEC 90003:2014 – Application of ISO 9001 to Computer Software Engineering
- IEEE 1012: Standard for Software Verification and Validation
- IEC 62304: Medical Device Software – Software Life Cycle Processes
- IEEE 829: Standard for Software Test Documentation
- Capability Maturity Model Integration (CMMI)
- ISO/IEC 9126 – Software Quality Model
- SPICE (Software Process Improvement and Capability dEtermination)

- IEEE 830: Standard for Requirements Specification, focusing on defining requirements for software systems.
- BOK (Body of Knowledge) Guide to the Software Engineering Body of Knowledge (SWEBOK)
- Capability Maturity Model for Software (CMM-SW): Developed by the Carnegie Mellon Software Engineering Institute (SEI)
- ISO/IEC 12203 – Software and System Development – Life Cycle Processes – Supplemental
- ISO/IEC 19769 – Requirements Engineering
- ISO/IEC 42001 - Software Development
- IEEE 61012 – Software Testing

Which OSS projects should be considered?

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Which OSS projects should be considered?

- Linux Kernel
- Most used projects
- glibc
- nixOS
- The biggest ones!
- Curl
- AutoSD
- Zenoh
- musl
- rustc
- Kuksa databroker
- Uclibc
- CIP
- Arduino IDE 🙂

- Zephyr
- Xen Project
- uProtocol

Which publications already exist?

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Which publications already exist?

- https://www.linkedin.com/advice/0/what-most-common-open-source-software-quality
- Thesis S. Tatschner: Towards a More Sustainable and Secure Software Tooling in Free/Libre Open Source Software Environments
- Tracking software cluster bombs: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4847570
- The process of quality assurance under open source software development https://ieeexplore.ieee.org/document/5958975
- Aspects of Software Quality Assurance in Open Source Software Projects: Two Case Studies from Apache Project https://ieeexplore.ieee.org/document/4301084
- Open Source software best practices and supply chain risk management on www.gov.uk
- Journals: IEEE Software admits papers from inudtry, not heavily based on research, including work in progress. There is (or at least there was) also an open source section on it.
- Perhaps RISE ?
- MSR (Mining software repositories), ICSE (Int. Conference on Software Engineering), ICSME, ASE (Automated Software Engineering), FSE (Fundaments of Software Engineering)
- Julia Lawall papers
- Draft - RTCA DO-395 is an RTCA document that supplements DO-178C/ED-12C and DO-278A/ED-109A, focusing on the use of Commercial Off-the-Shelf (COTS) and/or Open Source Software (OSS) in airborne systems. It provides guidance on integrating COTS/OSS into software development processes and ensuring their compliance with airworthiness requirements.
- Ask ChatGPT 😏 / I don't know, but Philippe Quéré may know 😊 / talk to Claire Dillon to ask if Lero has published something

Results will be incorporated into lighthouse-oss repo in ELISA