1st Accelerators Technology Sector Workshop

Engineering Design Tools and Processes
Project Management Methodologies and Tools

Chair: Mike Lamont

Interconnecting knowledge, experience, methods, people & data to foster learning & collaboration

CERN

ATS
Accelerators and Technology Sector

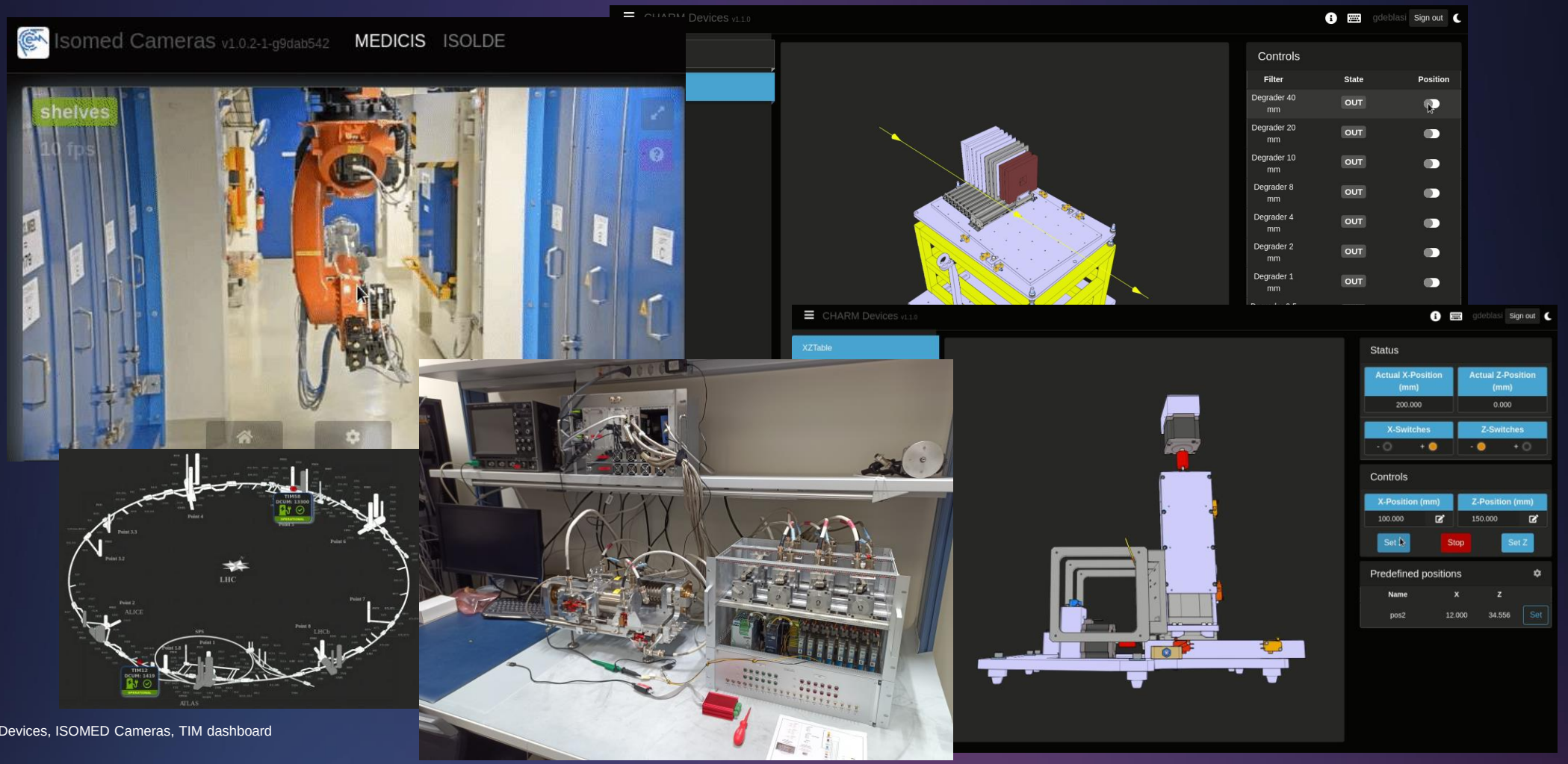
Creating high-quality, durable, efficient code: the software development workflow

Gabriele De Blasi

CERN

ATS
Accelerators and
Technology Sector

Mechatronics and Robotics



SAMbuCa, CHARM Devices, ISOMED Cameras, TIM dashboard

Software development in ATS

BE

ABP CEM

CSS GM

ICS OP

EN

ACE

EL

IM

SY

ABT BI

EPC RF

TE

VSC

CRG

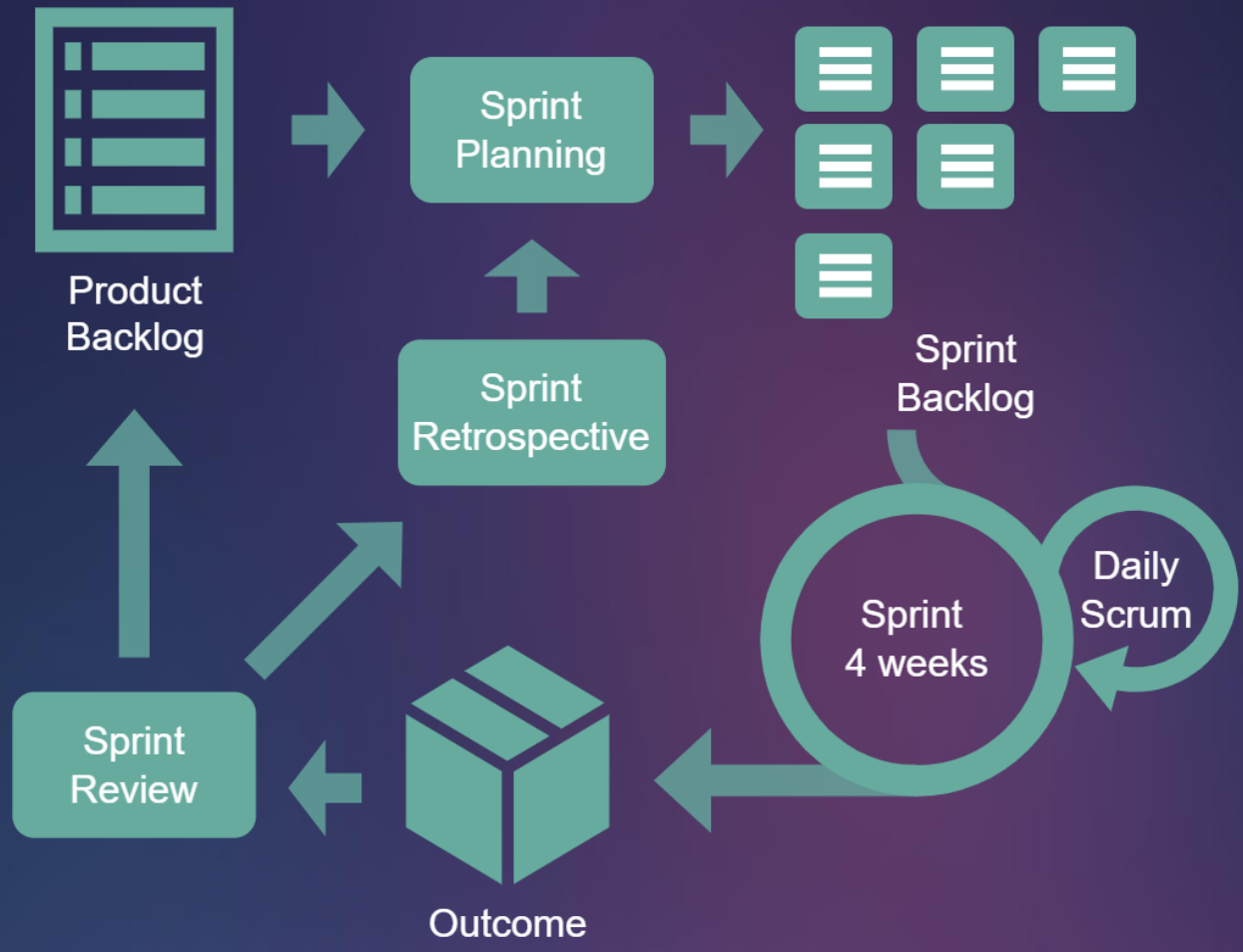
in short, almost all ATS!

Why do we need an (automated) Workflow?

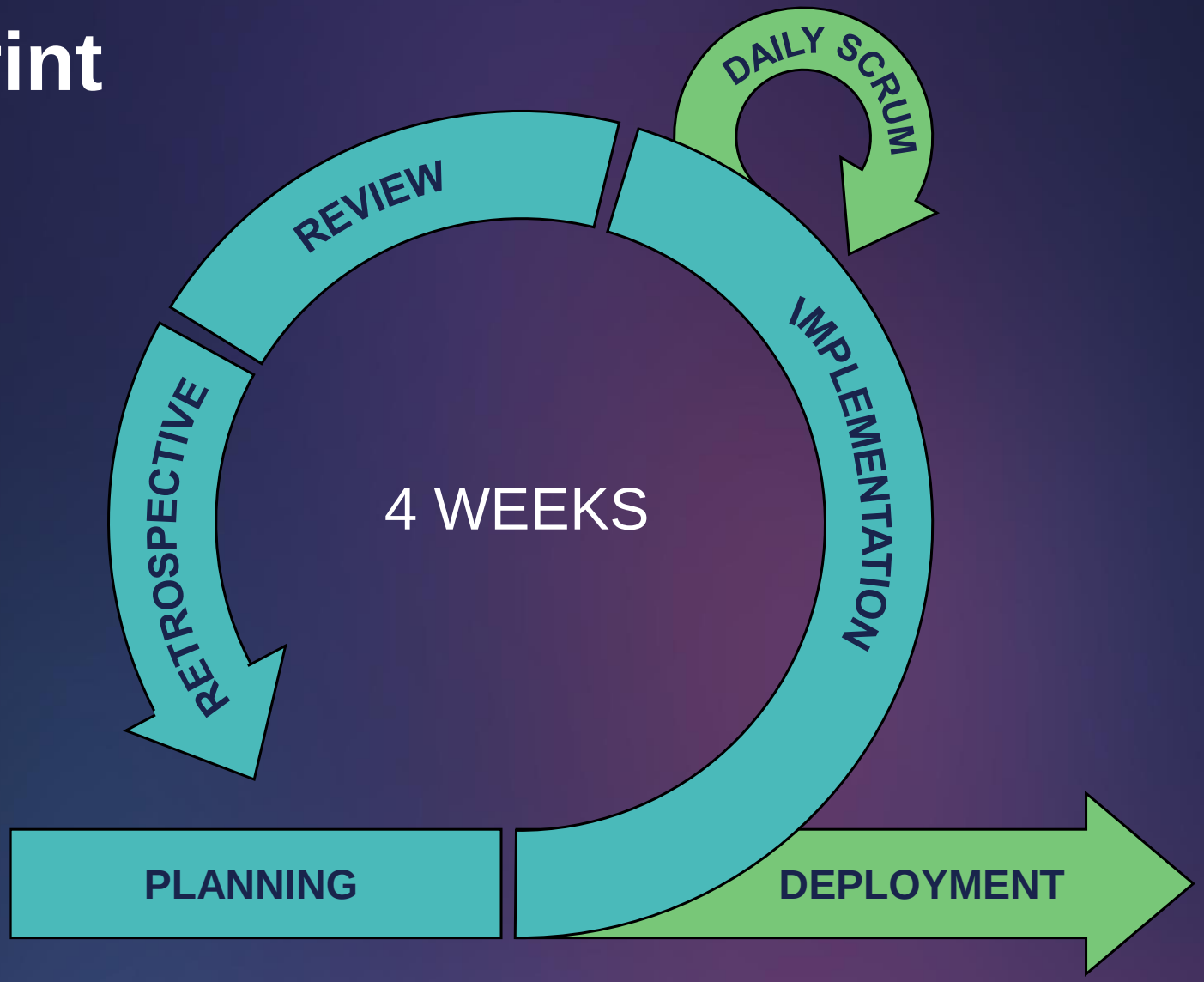
- **To guaranty higher quality and security:**
  - Standardized processes help maintain constant code quality.
  - Errors are caught early through systematic testing and reviews.
- **To enhance efficiency and productivity:**
  - Time wasted in repetitive tasks is significantly reduced.
- **To support and improve business processes.**

```
Screenshot
  ✔ can retrieve a screenshot (68ms)

Swagger exposition
  ✔ provides json open-api doc
  ✔ provides swagger doc

VarBuffer
  ✔ can be enlarged on demand
  ✔ can be sliced like a Buffer
  ✔ can remove first n bytes
  ✔ can be partially copied at a specific offset
```

A Scrum-based workflow



Scrum Sprint

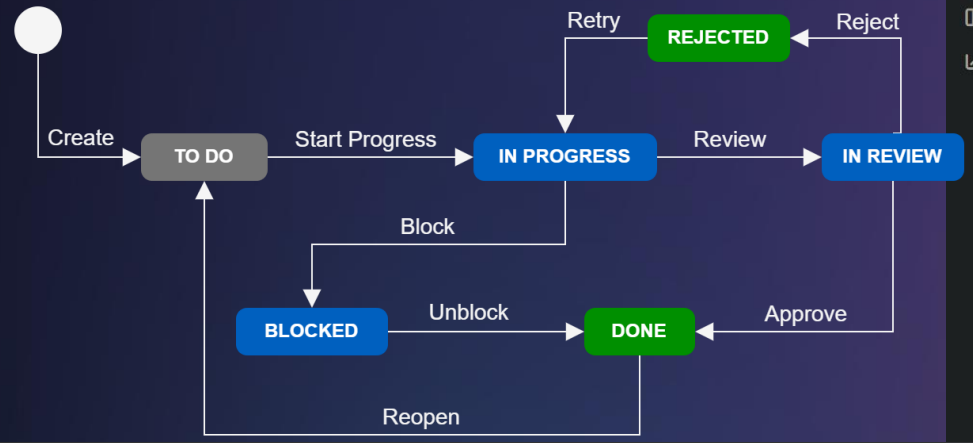


Planning

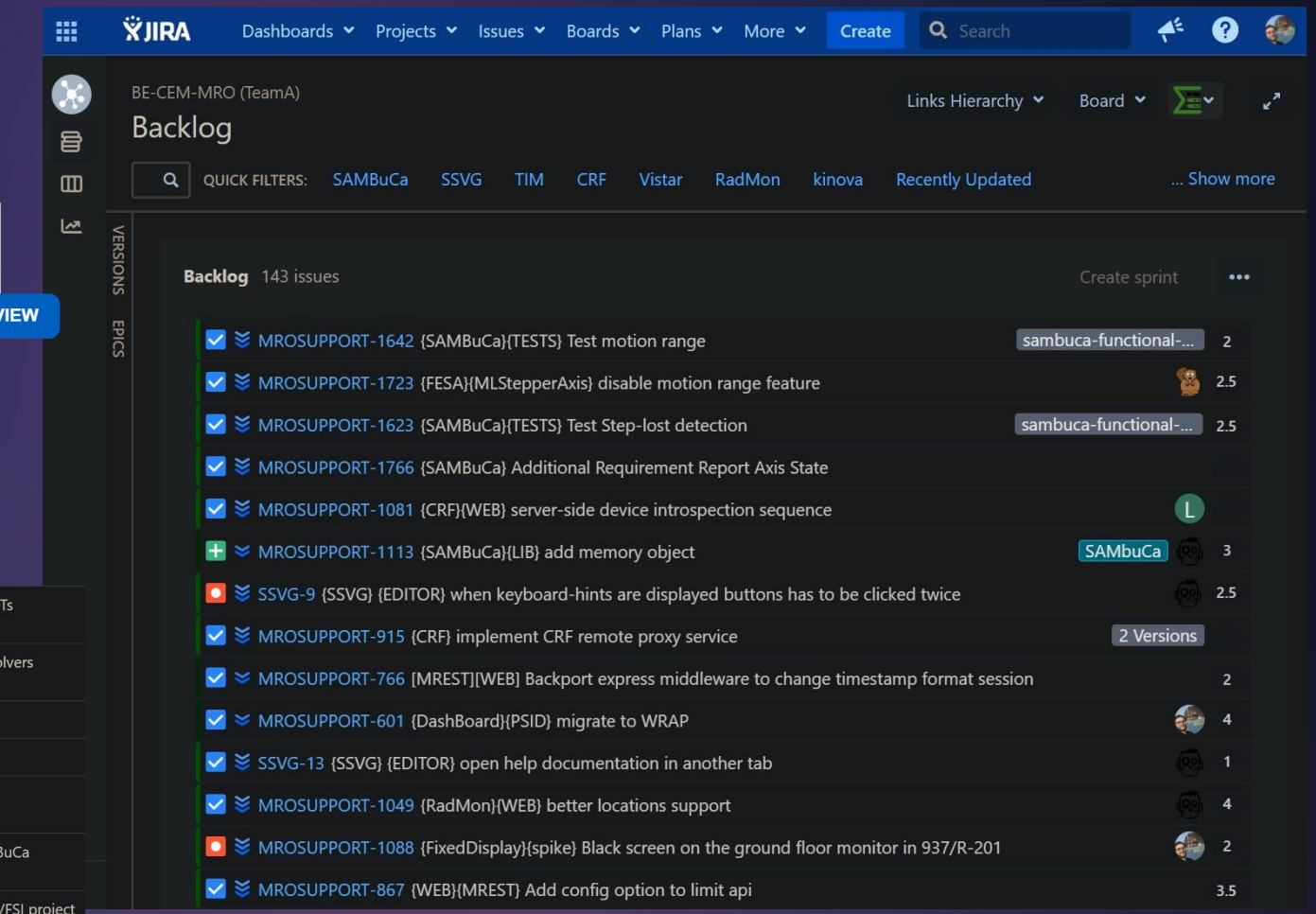

DAILY SCRUM
REVIEW
IMPLEMENTATION
RETROSPECTIVE
PLANNING
DEPLOYMENT

Project management

- **Facilitated thanks to Jira**



sambuca-mfe LVDT tuning	UNRELEASED		Characterization and tuning for LVDTs
sambuca-mfe resolvers tuning	UNRELEASED		Characterization and tuning for resolvers
kinova-protocol	RELEASED		Kinova arm protocol inspection
base-vue-3	UNRELEASED		base-vue library renewal
sambuca-func-tional-tests	UNRELEASED		SamBuCa functional tests
motion-lib-1.4.1 (homing)	UNRELEASED		Homing sequence handling in SamBuCa
motionlib-1.0 (FRAS / FSI)	UNRELEASED		MotionLib release suitable for FRAS/FSI project

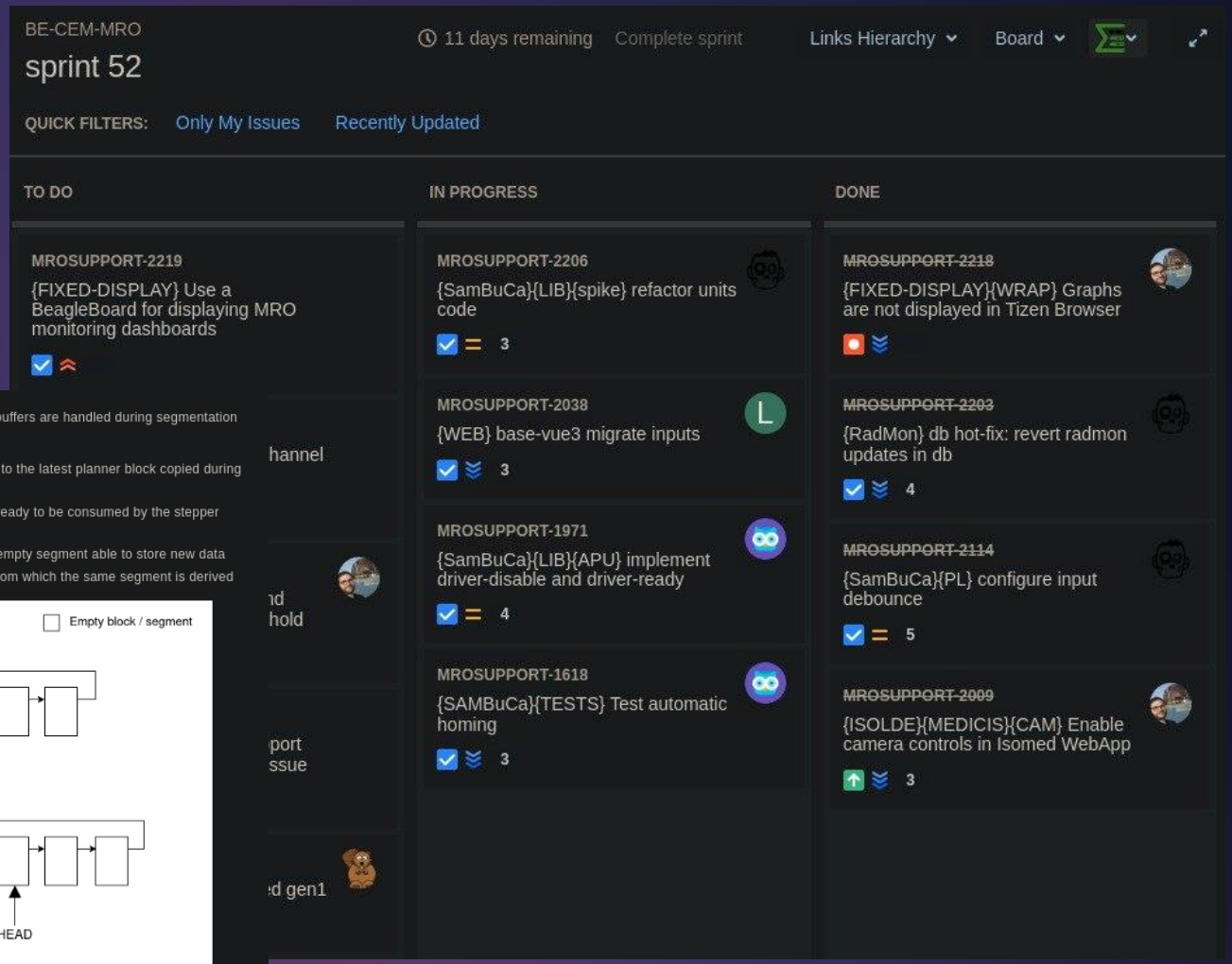


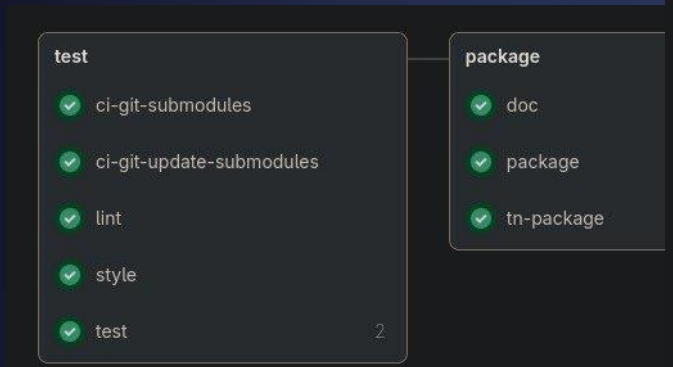
Credits: CERN Jira, Mountain Goat

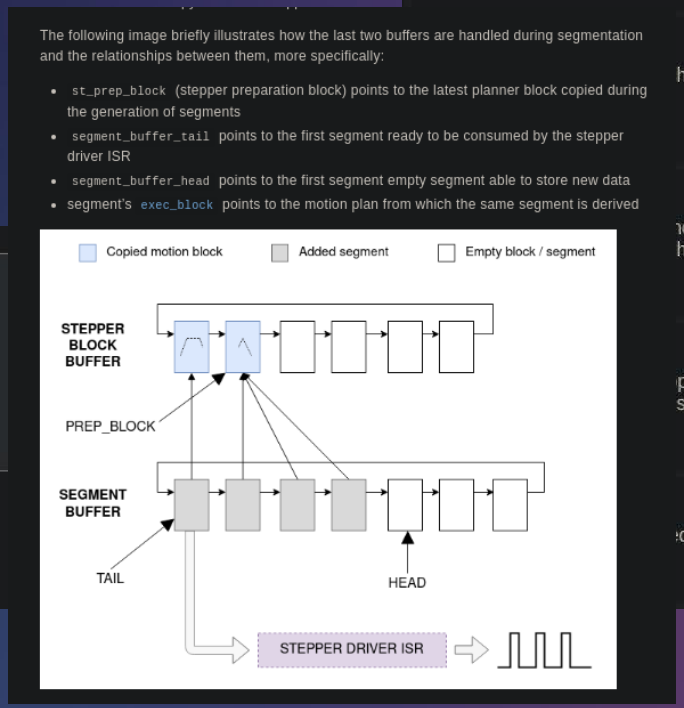
Implementation

Implementation 1/2

- Automated testing and quality control
- KanBan board
- Documentation



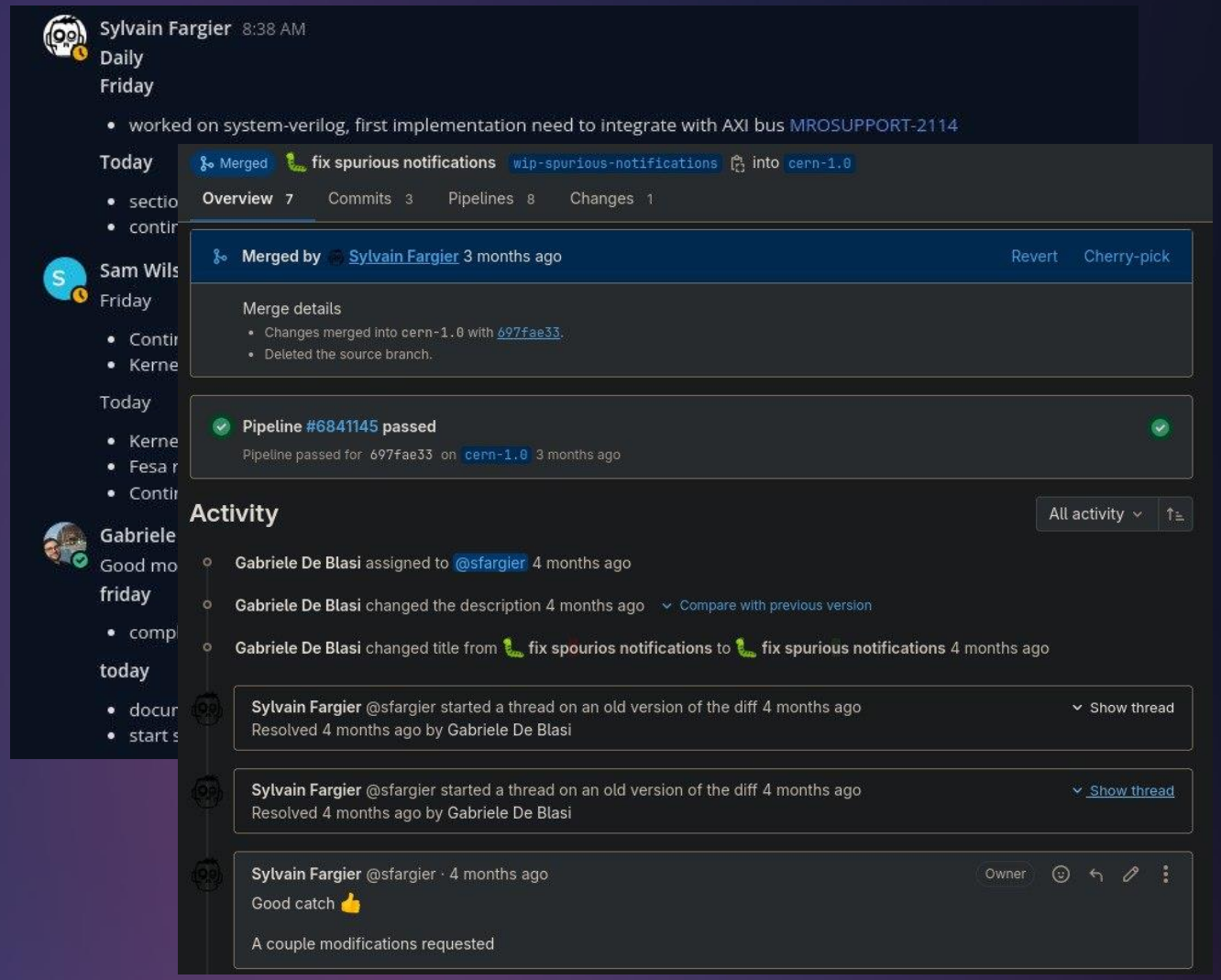




Credits: libccut Pipeline, CERN Jira

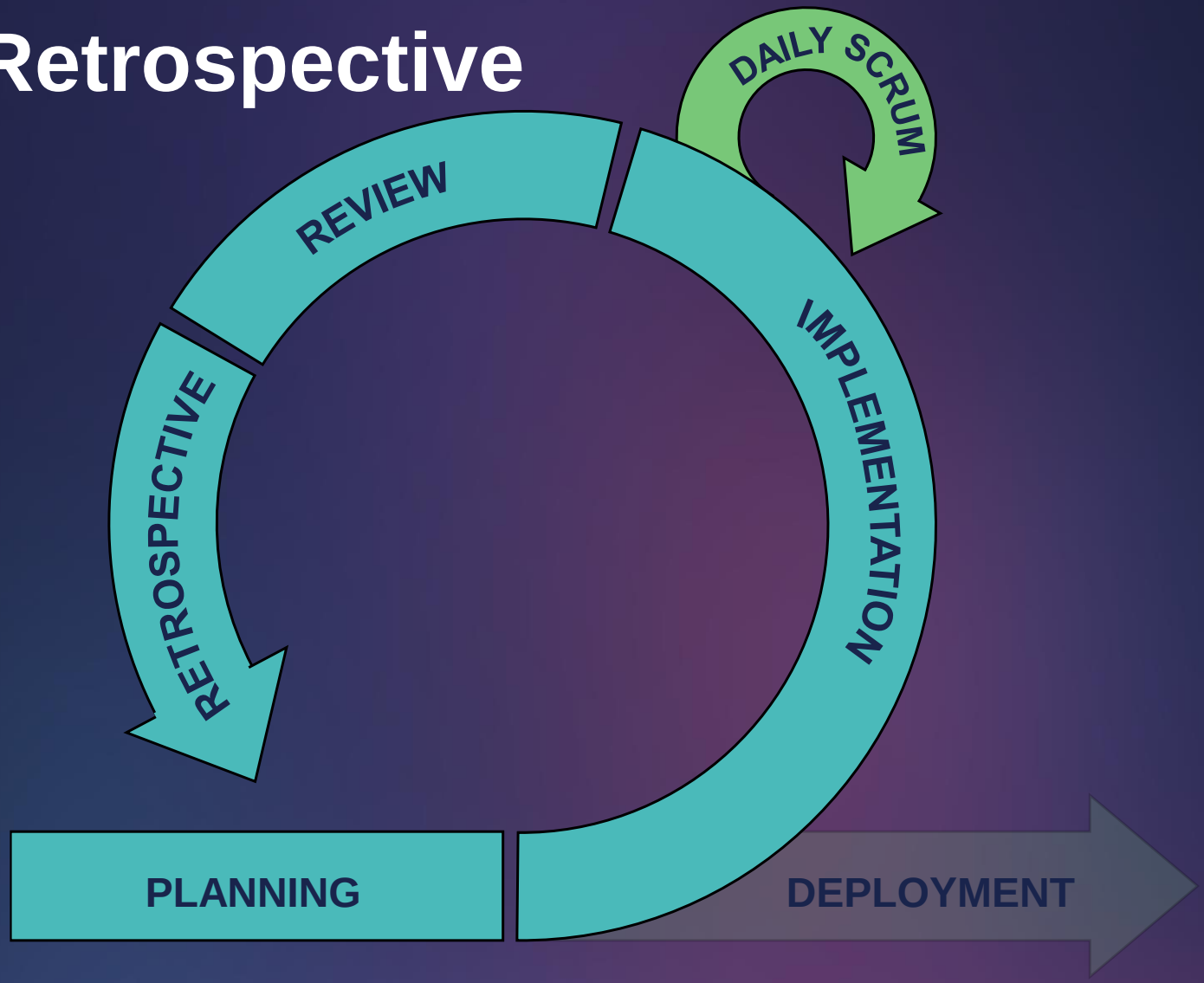
Implementation 2/2

- **Peer Reviews**
  - All work must be reviewed before being merged
- **Weekly Code Reviews**
  - To show your work or a topic will contribute to the team's growth
- **Daily-Scrums**
  - On Mattermost in addition to on-site stand-up dailies



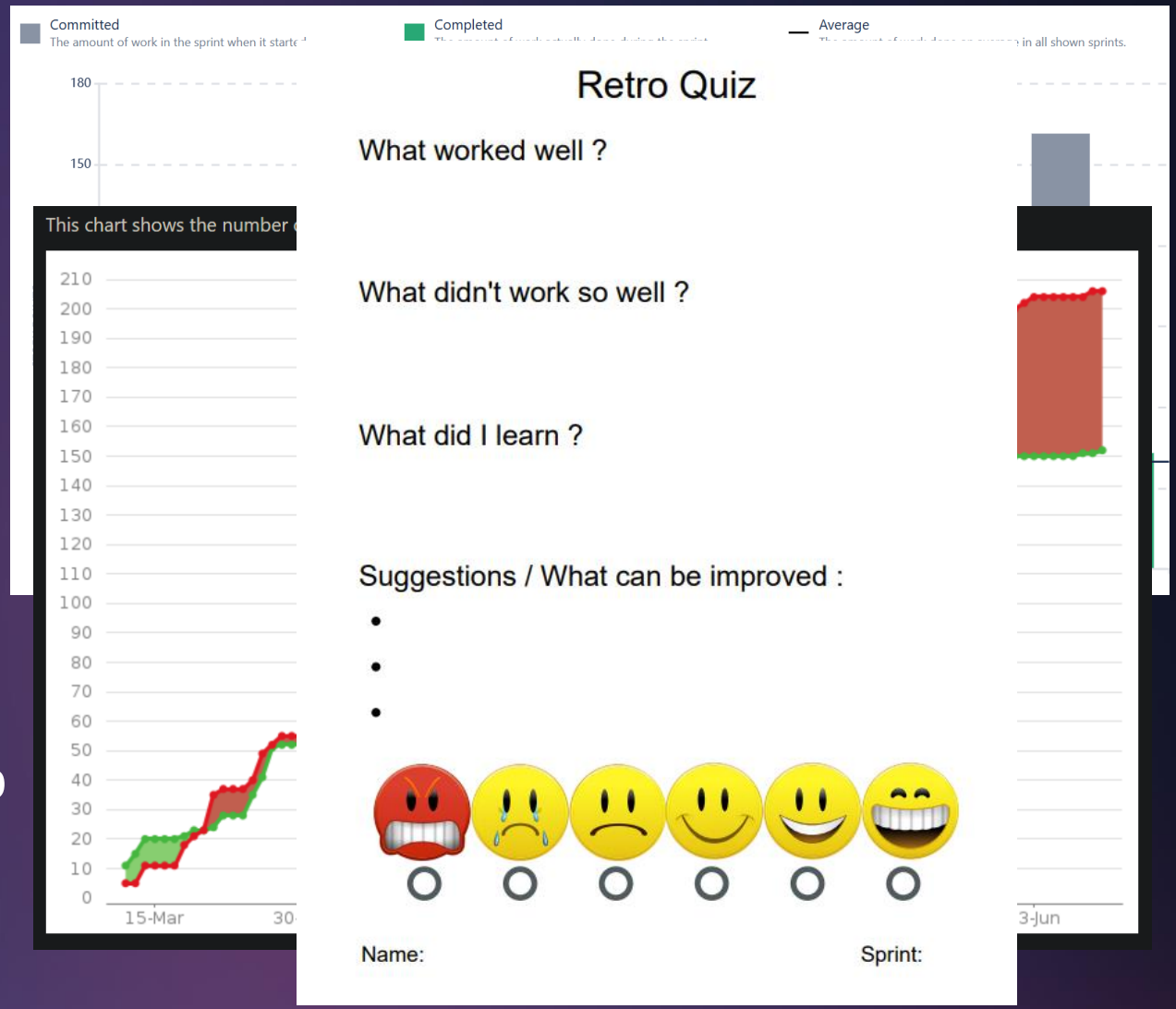
Credits: CERN Mattermost, CERN GitLab

Review & Retrospective



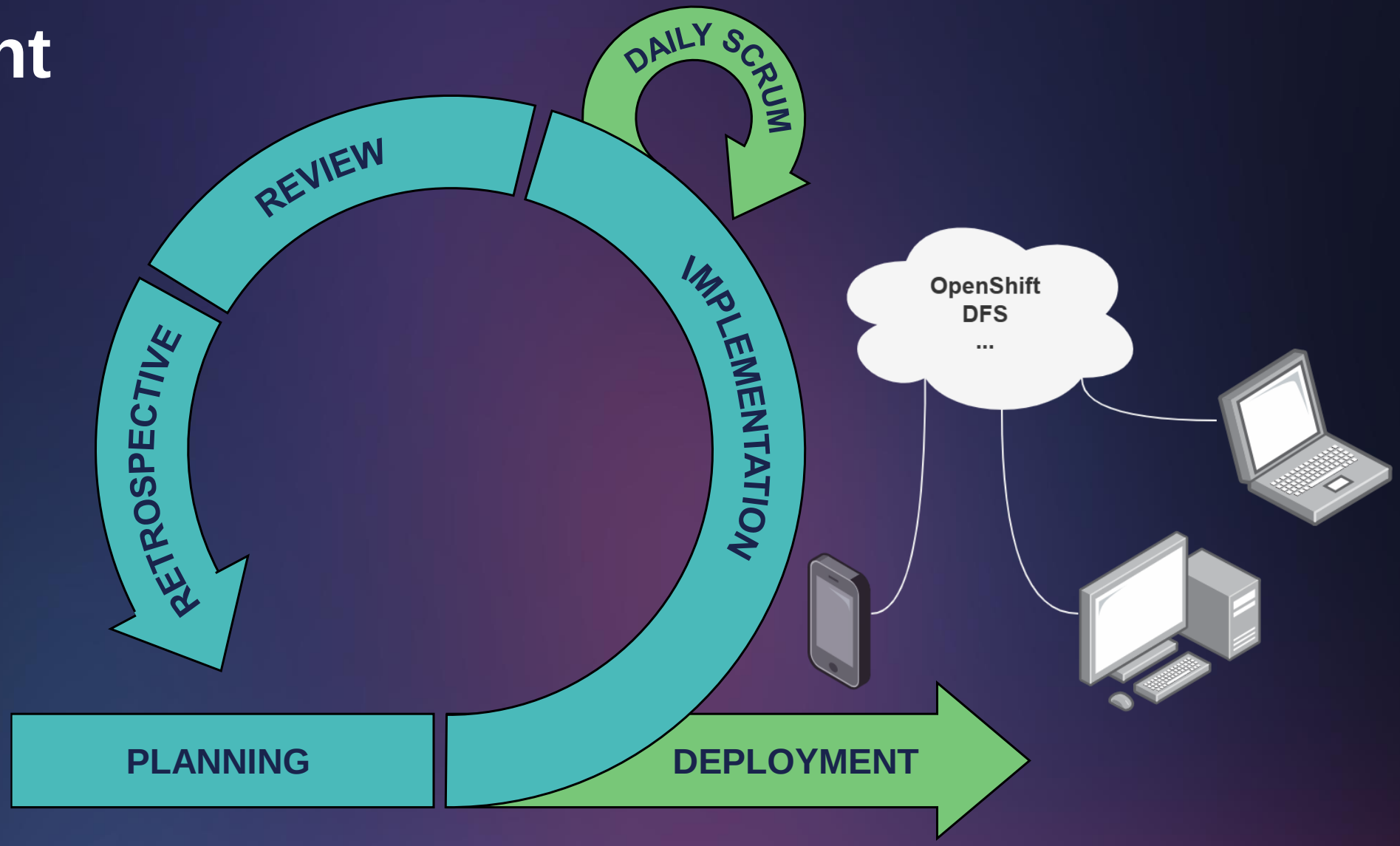
Review & Retrospective

- **Work review**
  - Updating the product backlog
- **Workflow analysis**
  - Using Jira reports
- **Continuous Improvement**
  - Identifying what can be enhanced and planning improvement actions to be implemented in the next sprint.



Credits: Retro Quiz (by Sylvain Fargier)

Deployment


DAILY SCRUM
REVIEW
IMPLEMENTATION
RETROSPECTIVE
PLANNING
DEPLOYMENT
OpenShift
DFS
...

Conclusion 1/2

- No one-size-fits-all workflow, each team implements its custom solution but faces the same challenges.
- Rely on proven methodologies (Scrum, XP, etc.), learn and benefit from the industry standard.
- Keep It Simple Stupid (KISS), so that everyone can understand and be part of it.

Credits: Wikimedia

Conclusion 2/2

- A clear and well-defined workflow is crucial for the success of any project and thus of business processes.
- By integrating testing, quality control and automation into a workflow, software reliability and maintainability increase significantly, along with productivity.
- Continuously improve your workflow by exploiting (properly) available tools such as Jira.
- The quality of decisions depends on the quality of data – adequate planning, reporting, estimating is essential.

Acknowledgment

Many thanks to **Sylvain Fargier**!

Thank you

Questions?