MES
MODEL ENGINEERING SOLUTIONS

SUPPORT PROCESSES FOR CODE GENERATION IN MODEL-BASED DEVELOPMENT

Modeling Guideline Interest Group

SOFTWARE QUALITY.
IN CONTROL.

SOLUTIONS FOR INTEGRATED QUALITY ASSURANCE OF EMBEDDED SOFTWARE

ORGANIZATIONAL INFO

- Questions?
  - Ask at any time – this is an open discussion.
  - Please check whether or not you are on mute.
  - Use the Q&A if sound is not working.
- You will receive the presentation afterwards by e-mail.
- Presenter: Sophia Kohle, Product Owner MXAM

OUTLINE

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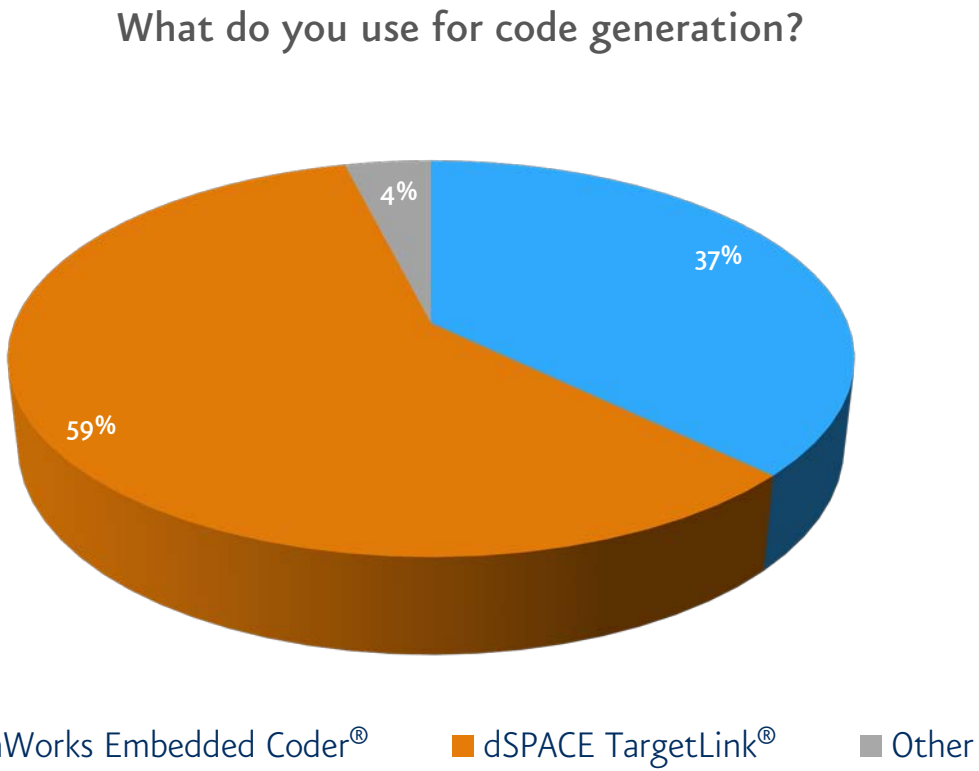
- Use of code generators
- Which optimization goals are most important regarding code generation and how do we achieve this?
- Let‘s discuss further challenges and how to solve these in context of code generation.

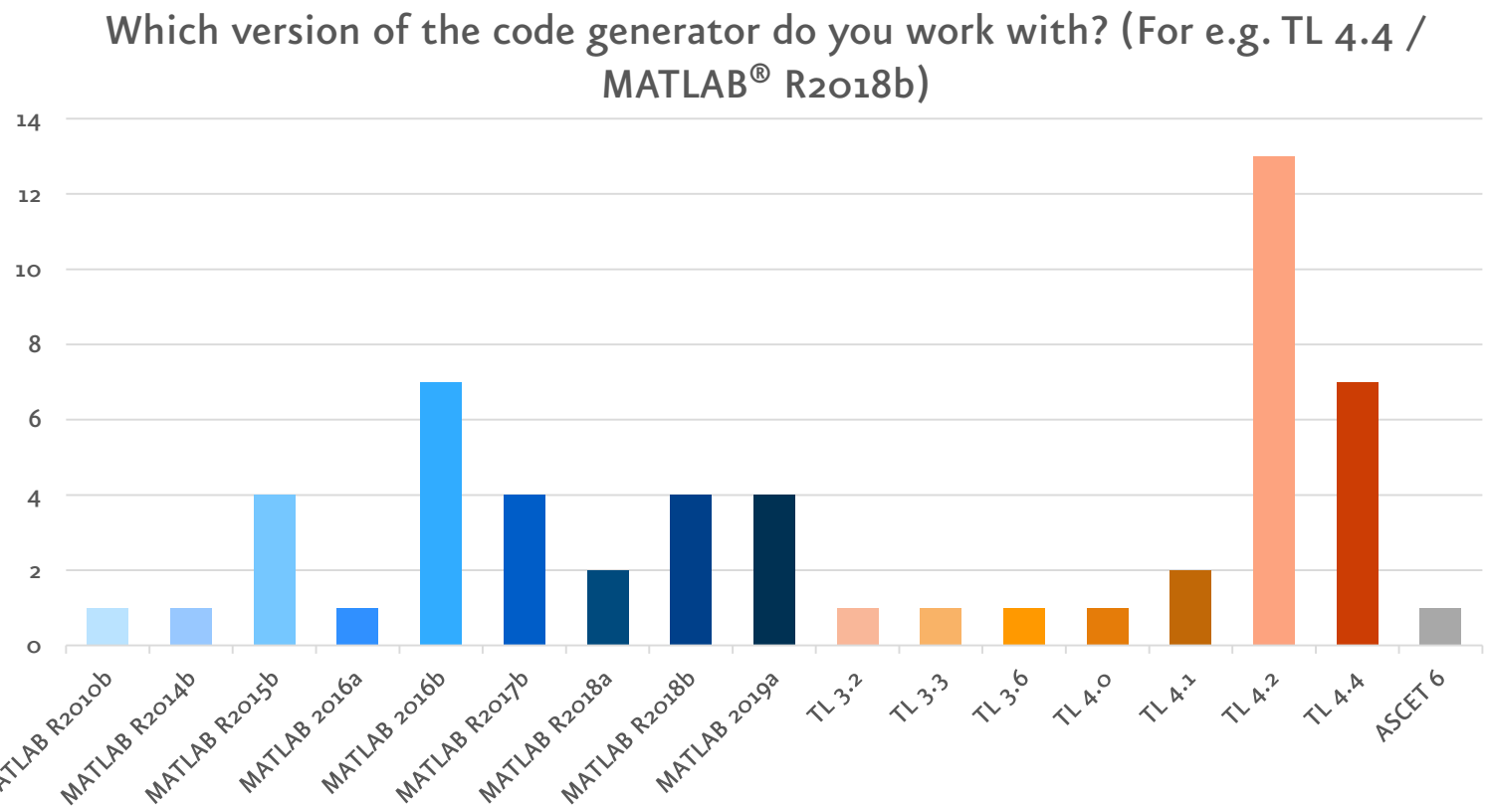
USE OF CODE GENERATORS



Your Feedback

43 answers as of December 3, 2019

VERSIONS OF CODE GENERATORS



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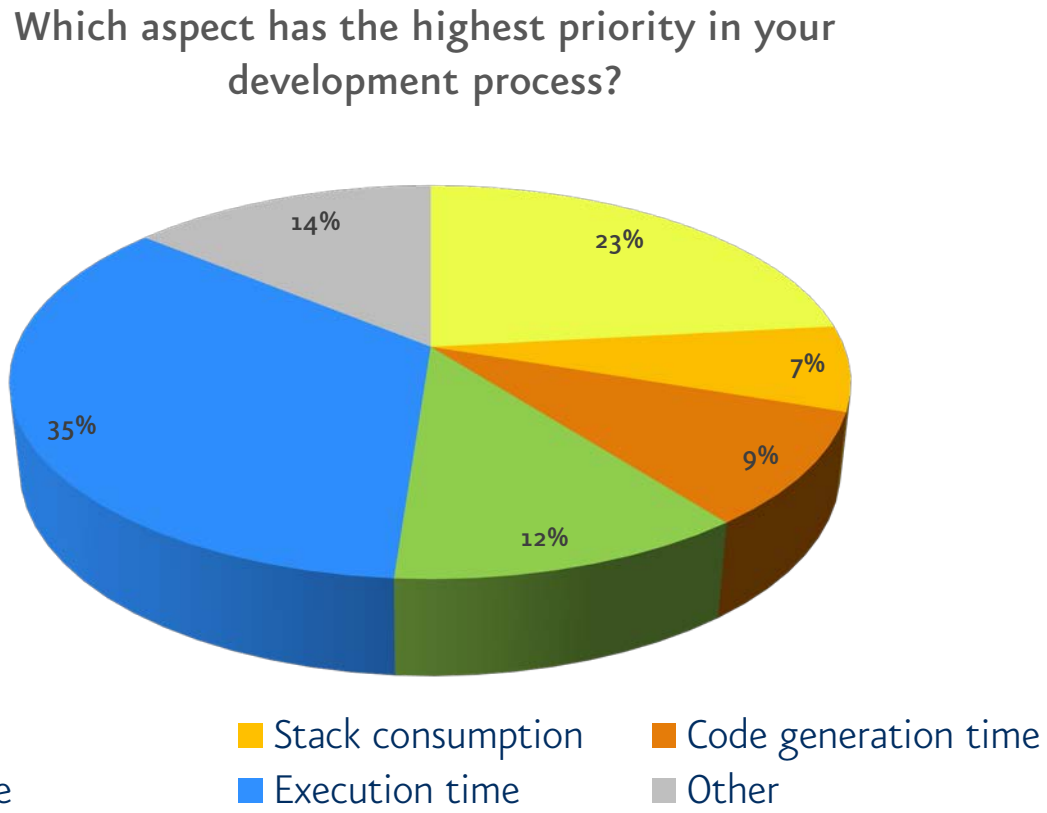
PRIORITIES



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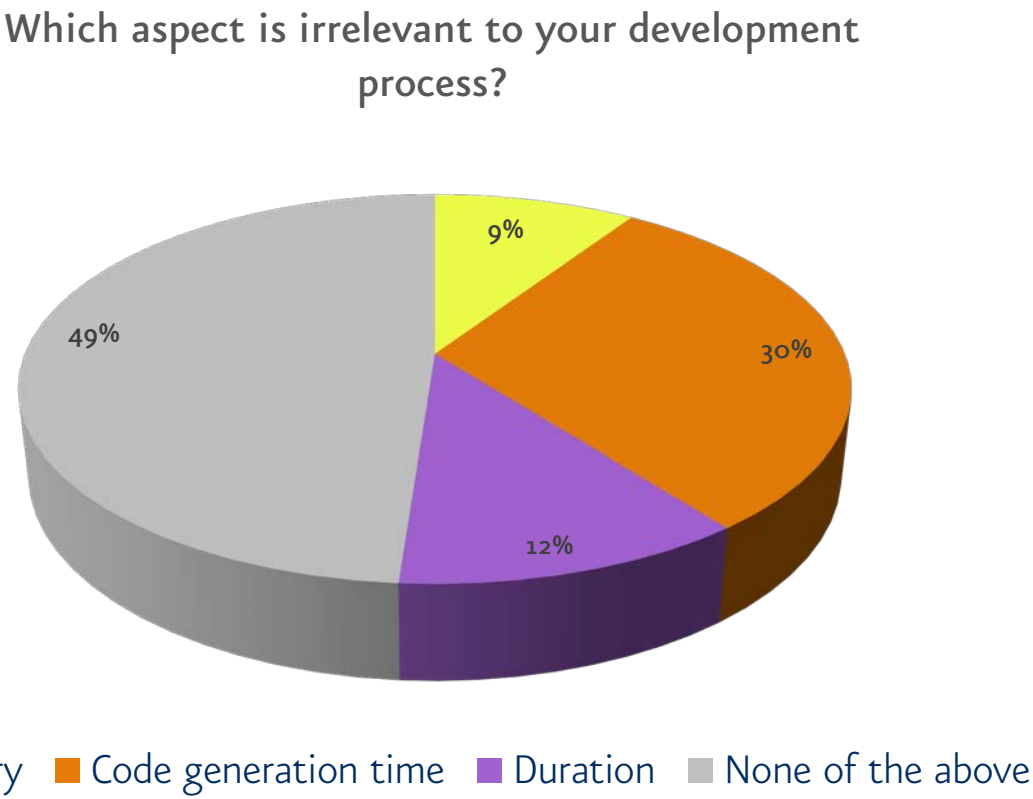
AUTOMATION REDUCES IMPORTANCE OF CG TIME?



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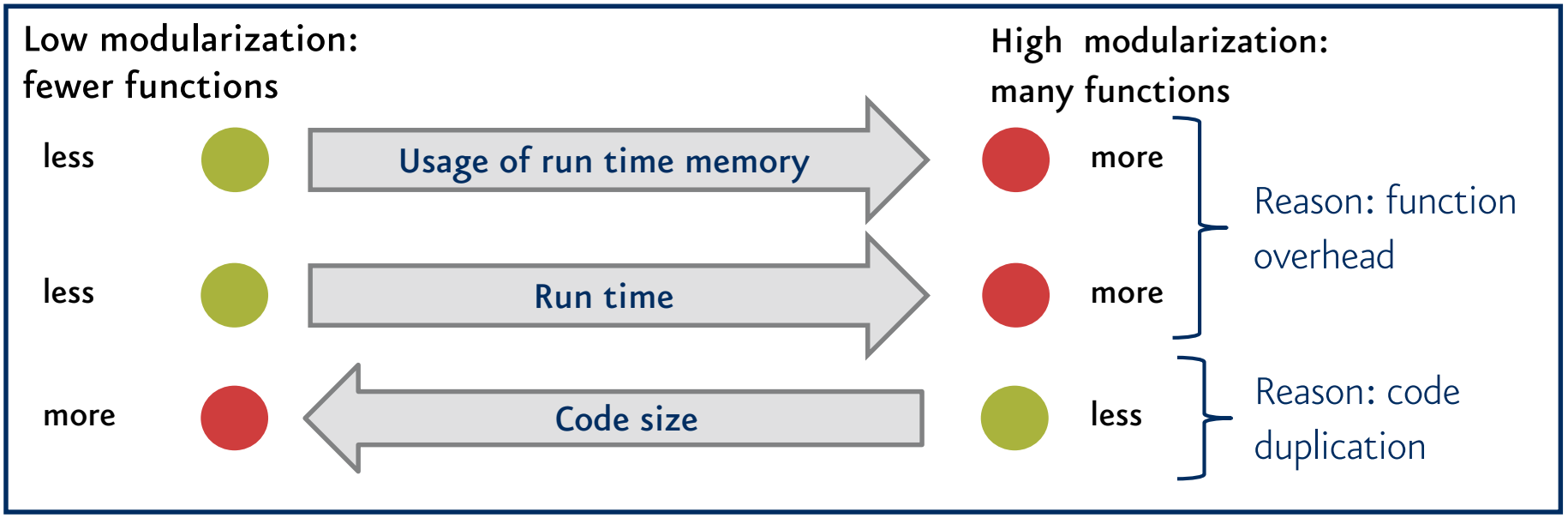
OPTIMIZATION OF GENERATED CODE

How can we deal with the trade off between different optimization goals?

Example:



HOW TO REDUCE EXECUTION TIME

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- Identify bottlenecks and fix these
  - Remove data copies
  - No architectural changes done (too late)
  - Firefighting: first in - first out
- Priority is on 1. run time 2. memory
  - remove function that are unused/only nice to have
  - are there good ways to identify this in advance?
- Using e.g. cyclometic complexity to understand where optimization can be done
  -

DISCUSS FURTHER CHALLENGES IN THE GROUP

- What challenges did you encounter in the past year with regards to code generation?
  - Support of different code generators (high level functions)
  - Change of compiler
  - Use of legacy code with nested structures as arguments (open)
- Which solutions or approaches have you found or come up with that might work?
  - Procedure to make sure that the constraints are met

DISCUSS FURTHER CHALLENGES IN THE GROUP

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What challenges did you encounter in the past year with regards to code generation?

- Software architecture and model structure effected to generated code structure complexity
- Integrate Multicore SW architecture into Code Generation, especially with regard to ASIL-relevant software
- Automatic toolchain for code generation creation and updating. Autocode transformation from not autocode friendly model to autocode friendly model. CPU load optimization.
- understand, how the generated code can be influenced by design pattern and code generation options.

LIVE WEBINARS & ON DEMAND VIDEOS

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- Check out our upcoming live webinars & our on demand webinars archive

Click here for
Live Webinars

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On Demand Webinars

MGI GROUP – NEXT ONLINE MEETING

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Tuesday, March 24, 2020

- 3 p.m. CET (Berlin)
- 10 a.m. EDT (Detroit)
- 7:30 p.m. IST (Bangalore)
- 10 p.m. CST (Beijing)
- 11 p.m. JST (Tokyo)

Registration:

- https://model-engineers-event-en.webex.com/model-engineers-event-en/onstage/g.php?MTID=e5345c2d74b323637c6063e3c77bf2422

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