

Where is Skynet? Can machine learning revolutionize the ICT industry?

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Pushing the envelope beyond the familiar territory

Software developers are in many ways laggards

.... We write apps with a text editor, debug it with a debugger as errors are reported from tests, written with the editor

.... The same way we did 30 years ago when I wrote my very first program

We always refer to the mysterious "user" that is supposed to benefit from our inventions

.... Why can't we be the users?

.... and breaking the tabu

Example: Cloud Software develops a collaborative coding environment, building on social media features

.... Stupid? Well I thought so about collective text editing; after composing some reports this way this is the only way to create multi-author documents

Another tabu: Systems designing systems

... Can systems really design systems?

Can systems design systems?

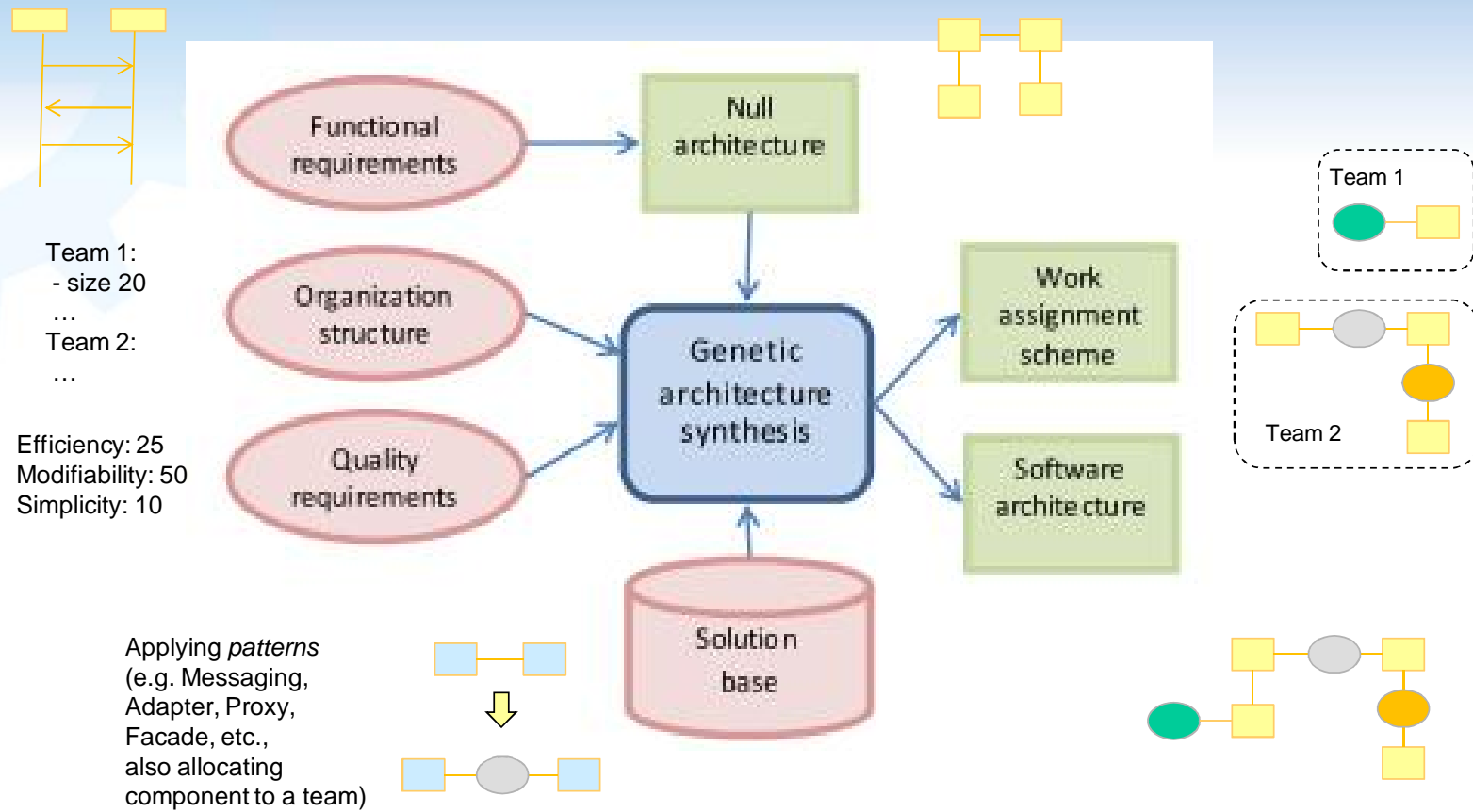
The Darwin experience (Prof. Kai Koskimies)

Darwin: project funded by Academy of Finland 2009-2011

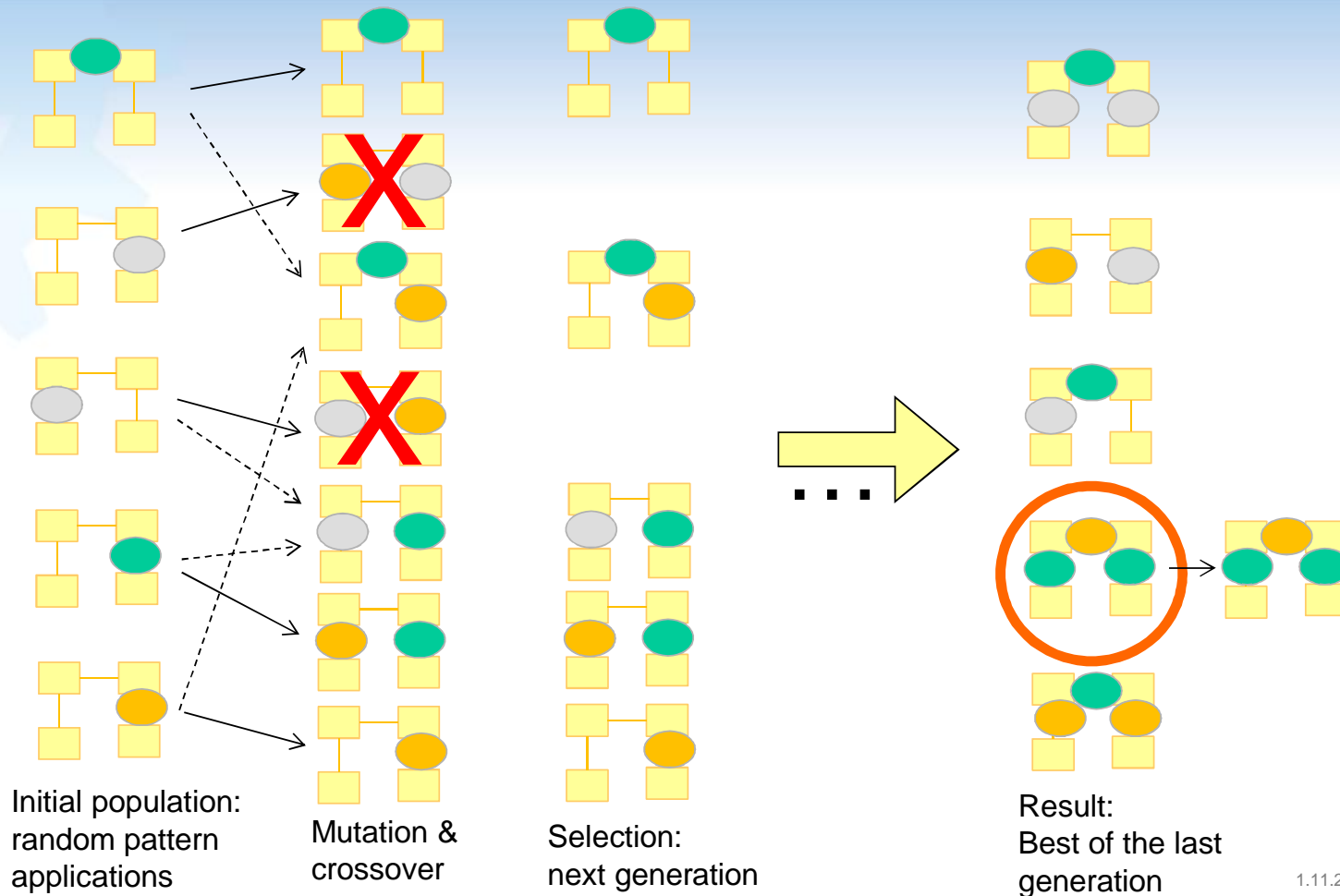
Research problem: To what extent can systems design systems?

Approach: Application of genetic algorithms to synthesize a software architecture proposal from given functional and quality requirements, and given development organization structure

Genetic software architecture synthesis



Simulated evolution of software architectures



So what does this mean?

- Assuming that software architecture can be expressed as a combination of patterns, systems can design systems (at least with the quality of a senior-level software engineering student)
- Immediate consequence: a system can redesign itself to adapt to new requirements, environment etc.
- Capability of self-architecting requires architecture-level reflection API

Any takers?

Thank you!

Architectural reflection infrastructure for self-adaptive Java systems

