

# FUTURESCAPE: OUTCOMES FROM THE SOFTWARE ENGINEERING INCUBATOR

## EXECUTIVE SUMMARY

The Software Engineering Incubator event at Aalborg University on April 30, 2024 brought together 30 industry leaders and researchers from the Copenhagen area to address critical themes in technology and software development. Key discussions spanned four focused areas, providing deep insights into the integration of AI in development processes, the alignment of business and IT strategies, the challenges and opportunities in AI testing and reliability, and the comparative analysis of project versus product development.

This summary encapsulates the discussions and outcomes from four focused Open Technology Tables, each addressing critical aspects of software engineering.

## KEY OUTCOMES:

1. **AI Adoption:** There was a consensus on the need for AI to augment development teams, focusing on sustainable and ethical implementation. Concerns were discussed regarding the impact of AI on junior developers' training and its broader ecological footprint.
2. **Business-IT Alignment:** Discussions underscored the importance of bridging the gap between business managers and IT teams to enhance organizational impact and align product development with consumer values.
3. **AI Testing and Reliability:** The reliability of AI systems was critically examined, noting the necessity for rigorous testing frameworks to handle the unpredictability of AI outputs and the potential to automate tedious testing tasks.
4. **Development Approaches:** A preference was noted for product-led development due to its long-term value and adaptability, compared to project-led development which often results in higher technical debt and stress due to its deadline-driven nature.

The event emphasized the importance of ethical considerations, collaborative strategies between business and technology teams, and the role of education in shaping future software engineering practices. The discussions pointed towards a future where AI integration is thoughtfully managed, aligning closely with strategic business goals and robust testing protocols to ensure reliability and effectiveness.

## 1. AI ADOPTION IN SOFTWARE DEVELOPMENT

The table dedicated to AI adoption in software development emphasized the integration of generative AI (genAI) in enhancing the productivity and capabilities of development teams rather than just embedding AI features in software products.

### KEY OUTCOMES:

- Sustainability Concerns: Discussion on the environmental impact of genAI, with an emphasis on balanced adoption, addressing both user expectations and ecological responsibility.
- Adoption Speed and Organizational Integration: Varied adoption rates across organizations highlighted the exploratory nature of AI implementation, reflecting a spectrum from full integration to cautious engagement.
- Development Profiles and AI Utilization: Concerns were voiced about the reliance on AI potentially impacting the development of junior developers' skills, questioning the future availability of experienced senior developers.
- AI as a Tool, Not a Team Member: There was a strong consensus that AI should be viewed strictly as a tool to aid human developers, lacking the social dynamics essential for a team member.
- Future Potential and Educational Focus: The future of genAI in software development is seen as highly promising, moving towards more intuitive, user-driven design processes. Education should shift focus towards critical thinking and understanding the broader role of a software engineer.

## 2. BUSINESS-IT ALIGNMENT

This table tackled the disconnect between business and IT teams within organizations, stressing the need for closer collaboration to enhance societal impact and product value.

### KEY OUTCOMES:

- **Barriers to Effective Alignment:** Identified barriers included premature technology adoption, large organizational structures, and the lack of shared values.
- **Role of AI in Bridging Gaps:** AI tools, particularly AI-driven recommendation systems, were discussed as potential facilitators in bridging the gap between business objectives and engineering processes.
- **Consumer-Driven Definitions of Impact:** The definition of making the world a better place should be aligned with consumer values and preferences, which dictate the direction and impact of business initiatives.

## 3. AI TESTING AND RELIABILITY

The reliability and testing of AI systems were scrutinized, especially in the context of generative AI's integration into software development life cycles.

### KEY OUTCOMES:

- **Challenges with AI Outputs:** Issues such as the unpredictability of AI behavior, maintenance of code quality, and the potential for AI to generate misleading outputs were discussed extensively.
- **Opportunities for Enhanced Testing:** The potential of AI to automate and enhance testing processes, improve integration with human-driven processes, and elevate the level of abstraction in software testing.
- **Educational and Training Needs:** Highlighted the necessity for developers to be trained in critical evaluation of AI tools to ensure reliability and effectiveness in deployment.

## 4. PROJECT VS. PRODUCT DEVELOPMENT

The discussion contrasted project-led and product-led development approaches, discussing their respective impacts on code quality, developer stress, and long-term value creation.

### KEY OUTCOMES:

- Comparison of Development Approaches: Product-led development was favored for its focus on long-term value and adaptability, whereas project-led development was critiqued for fostering short-term thinking and technical debt.
- Technical and Managerial Solutions: Suggestions for reducing technical debt and improving project outcomes included better initial planning, stakeholder alignment, and considering fast project execution as a valuable product in itself.

## CONCLUSION

The Software Engineering Incubator provided a fertile ground for deep discussions and insights into the future of software development, emphasizing the critical role of AI, the importance of aligning business and technology strategies, the challenges in AI testing and reliability, and the strategic decision-making between project and product development. These discussions underline the evolving nature of software engineering and the ongoing need for industry and academia to collaborate in addressing these challenges.

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