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User-experience-focused design roadmapping: Application to a Smart Autonomous Vehicle Cockpit

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CONTEXT

The accelerating technological progress rapidly changes the landscape of available design options in the automotive domain. Constant innovations in the design and functionality of an increasingly autonomous vehicle drive the evolution of the design of a cockpit.

New product development (NPD) of Human-Machine Interface (HMI) is an *inertial* process which, at the same time, rests on technological and user-experience trends. Therefore, these trends need to be forecasted and NPD activities should be planned in advance.

KEYWORDS

Model-based Systems Engineering, Technology Roadmapping, Human Machine Interfaces, User experience, Autonomous car, New product development

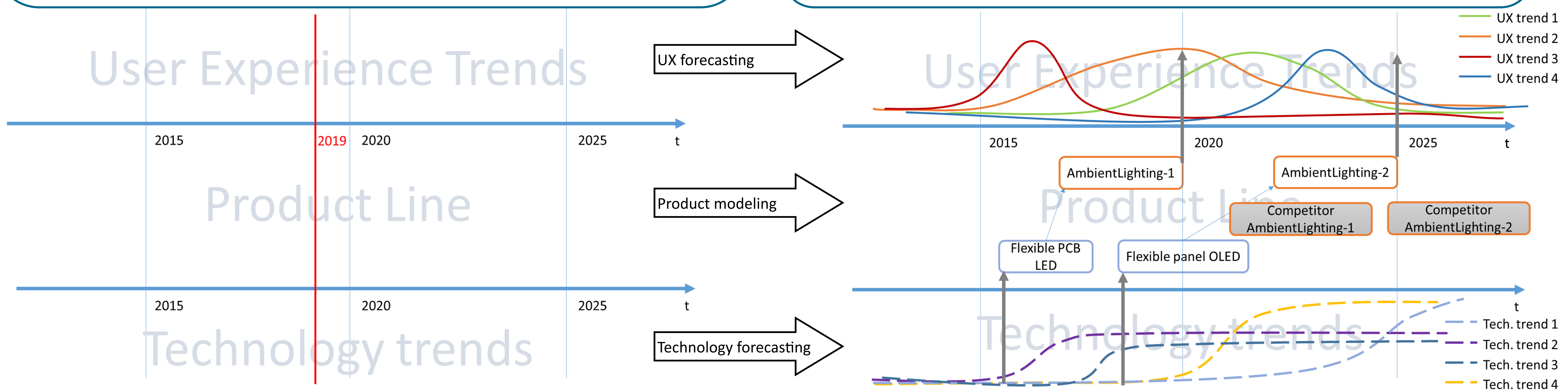
OBJECTIVE

Development of the methodology and tools aiming at the efficient management of the inertial NPD process in the VUCA environment¹ (volatility, uncertainty, complexity and ambiguity) with special focus on user experience. This approach will include following elements:

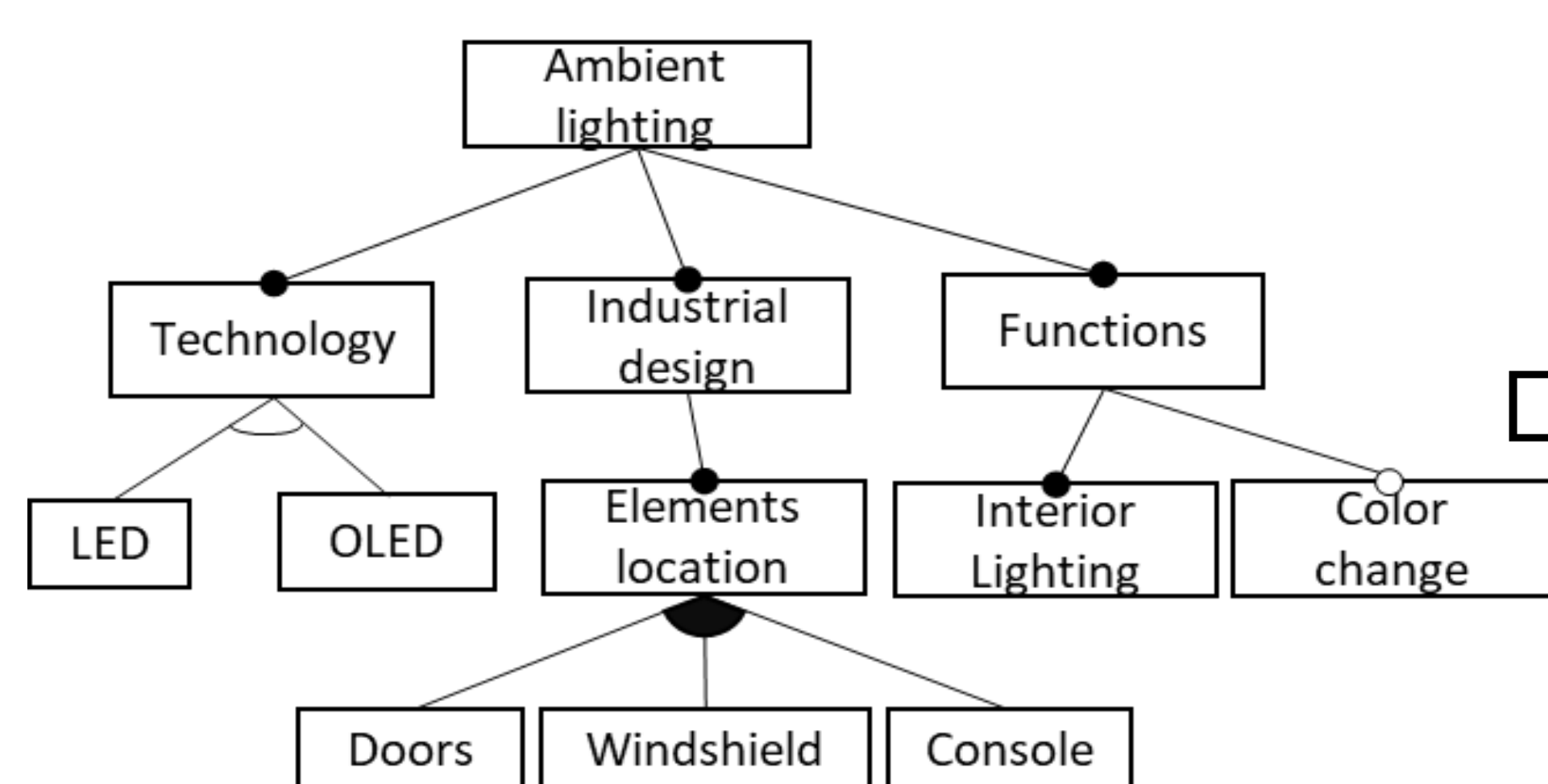
- User-experience trend forecasting processes:
 - user-generated content analysis²;
 - personalized product evaluation³;
- Technology trend forecasting;
- Product feature modeling

CASE STUDIES

- Interior lighting;
- Human-machine Interface of an autonomous car



Product Feature model

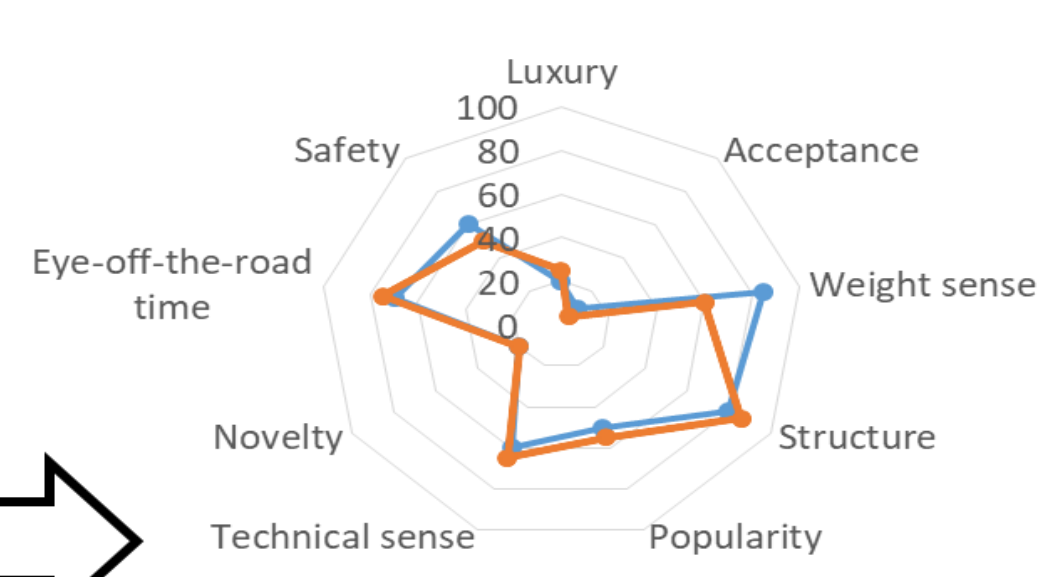


Cross-tree constraints:
 OLED -> not (Console)
 OLED -> not (Color change)



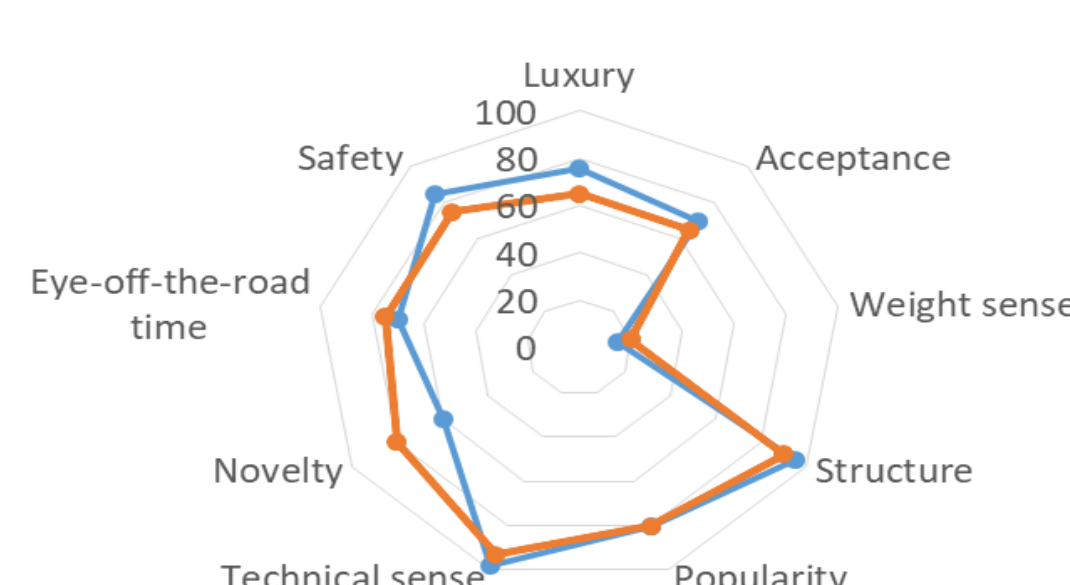
Configuration 1

— Market 1 — Product 1



Configuration 2

— Market 2 — Product 2



REFERENCES

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3. Quan, H., Li, S., Wei, H., & Hu, J. (2019). Personalized Product Evaluation Based on GRA-TOPSIS and Kansei Engineering. *Symmetry*, 11(7), 867.