

A study on architecture decision variables for WSD control units

Sehyun Kim¹⁾ · Gyeil Cho^{*1)} · Daehoon Hong¹⁾ · DaeChang Jung¹⁾ · Jangmook Lim²⁾

HYUNDAI MOBIS¹⁾, HYUNDAI MOTER COMPANY²⁾

Key words : Concept of Operations, Safety Control Module, Pareto Frontier, Figure Of Merit, Morphological Matrix, Wearable Safety Device

* Gyeil Cho, E-mail: intelion@mobis.co.kr

Recently, personal mobility devices such as electric scooters have been increasingly used for first/last-mile transportation convenience, and as a result, interest in personal wearable safety devices has also grown. Various wearable safety devices, such as jacket-type, helmet-type, backpack-type, and muffler-type airbags, are being introduced, and with this safety device paradigm shift, the market is expected to grow by more than 10% annually.

In response to this demand, a differentiated safety service applying wearable airbags to shared electric scooter business models has been proposed, and the need to derive an appropriate architecture for wearable airbag control units has raised.

Therefore, in this study, we identified the figure of merit by reflecting the inherent quality characteristics of the safety control module (a.k.a. airbag control unit) and the quality characteristics of wearable/mobile devices based on stakeholder's needs and concept of operations. We also constructed a morphological matrix and Pareto front considering various variables and researched architecture decision variables and configuration options.

This study can provide insights for safety systems engineer to develop candidate architecture that meet the needs and preferences of stakeholders.

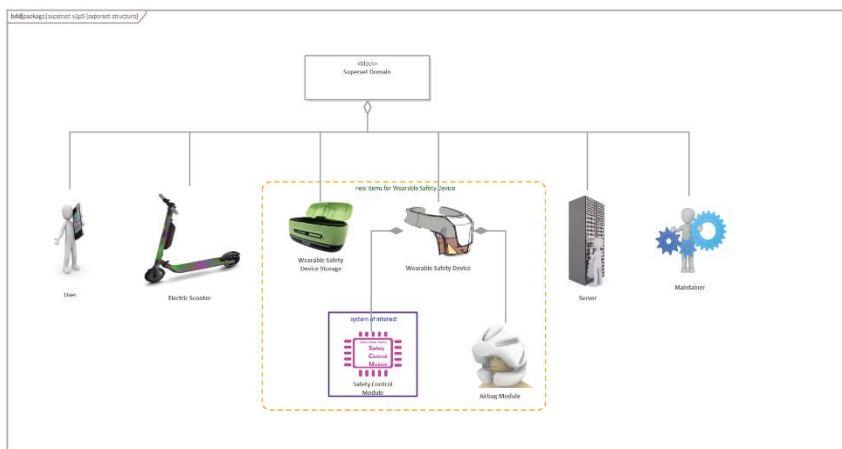


Figure 1. Super System