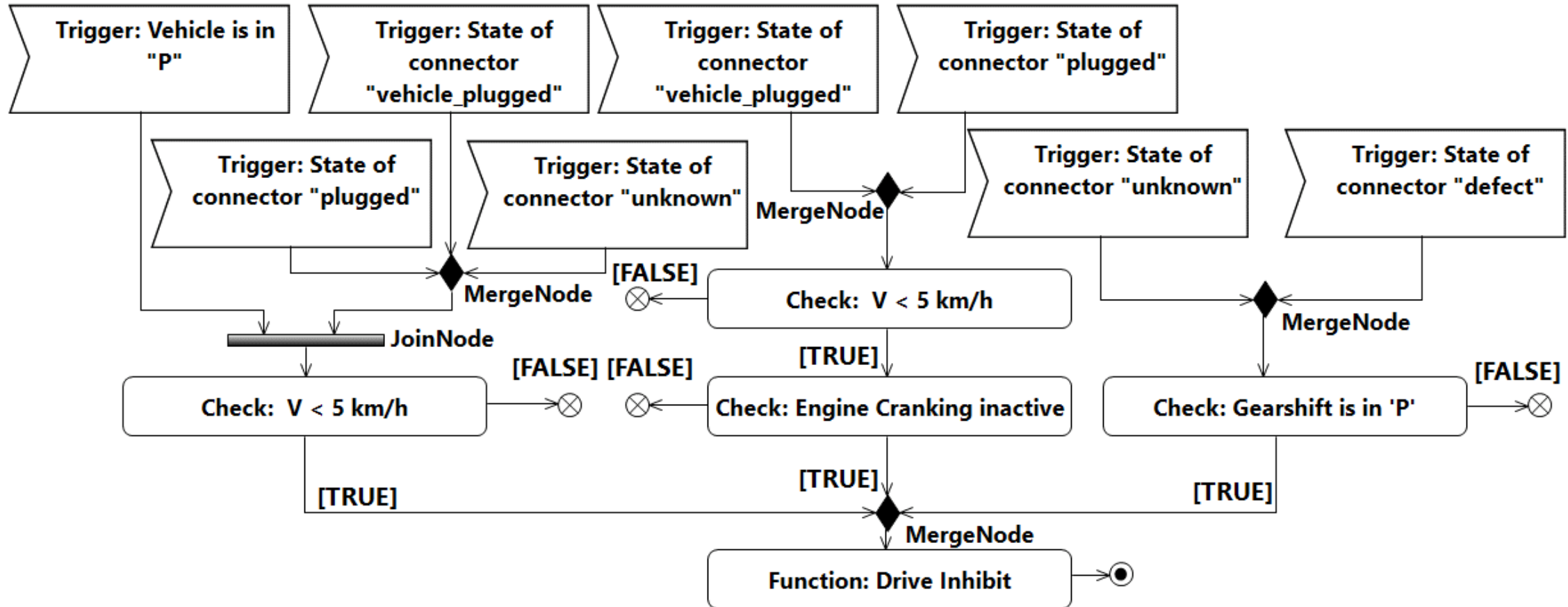


Coexisting Graphical and Structured Textual Representations of Requirements: Insights and Suggestions

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| ID | Text | Level | Type |
|------|---|-------|----------|
| 1000 | Drive Inhibit | 2 | Function |
| 1236 | State of connector "unknown" OR State of connector "defect" OR | 3 | Trigger |
| 1237 | Vehicle Gear Selector is in position "P" AND | 4 | Check |
| 1113 | Engine Cranking inactive OR | 4 | Check |
| 1111 | State of connector "plugged on vehicle side" ("VEH_PLUGGED") OR "plugged on vehicle and EVSE side" ("PLUGGED"). OR | 3 | Trigger |
| 1112 | Vehicle velocity is below 5 km/h | 4 | Check |
| 1114 | Vehicle Gear selector is in position "P" OR | 3 | Trigger |
| 1232 | Vehicle velocity is below 5 km/h | 4 | Check |
| 1233 | State of connector "plugged on vehicle side" OR State of connector "plugged on vehicle and EVSE side" OR State of connector "unknown" AND | 3 | Trigger |
| 1238 | Vehicle velocity is below 5 km/h | 4 | Check |

M. Beckmann, et. al., „A Case Study on a Specification Approach using Activity Diagrams in Requirements Documents“. 25th IEEE International Requirements Engineering Conference. (2017)

- Study: Interviews with eight stakeholders of a system
- For which tasks do the stakeholders use which representation?
- What are the reasons why stakeholders use one or the other representation for specific tasks?
- What challenges arise in the combined use of graphical models and text and how should they be addressed?

Table 1: Statements about the use of graphical models by participants

| Participant | considered beneficial | considered necessary | means of communication / discussion | improves under- standability | should be basis for text | display architecture | represents relations | used for planning |
|-------------|--------------------------|-------------------------|---|---------------------------------|-----------------------------|-------------------------|-------------------------|----------------------|
| C_1 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ✓ | — |
| C_2 | ✓ | — | ✓ | ✓ | ✓ | — | ✓ | — |
| C_3 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ✓ | — |
| T_1 | ✓ | — | ✓ | ✓ | ✓ | — | ✓ | — |
| T_2 | — | ✓ | — | — | ✓ | — | — | — |
| M_1 | — | ✓ | — | ✓ | — | ✓ | ✓ | ✓ |
| M_2 | — | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | — |
| M_3 | — | ✓ | ✓ | ✓ | — | — | ✓ | ✓ |

Table 2: Statements about textual descriptions by participants

| Participant | acts as reference | legal consid- erations | contains details | handover for supplier | used for non-functional requirements | support stakeholders unfamiliar with models |
|-------------|----------------------|---------------------------|---------------------|--------------------------|--|---|
| C_1 | ✓ | — | ✓ | — | — | ✓ |
| C_2 | ✓ | — | ✓ | — | — | — |
| C_3 | ✓ | — | ✓ | ✓ | — | — |
| T_1 | ✓ | — | — | — | — | — |
| T_2 | — | ✓ | ✓ | ✓ | — | ✓ |
| M_1 | — | — | ✓ | ✓ | — | — |
| M_2 | — | — | ✓ | ✓ | ✓ | ✓ |
| M_3 | — | — | ✓ | — | — | ✓ |

- Use activity diagram as a starting point
- Derive textual representation from activity
- Provide users with the original model?
- Incorporate changes in the activity

- Graphical models seen mostly as „pretty pictures“ by users
 - Different tasks associated with different artefacts
 - Graphical models not suitable to replace text for specification purposes
- Potential risk of introducing inconsistencies
 - Tool support

Using coexisting graphical models and textual descriptions is perceived as beneficial by practitioners despite numerous challenges

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