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Research Questions and Hypotheses in FOTs and ND Studies

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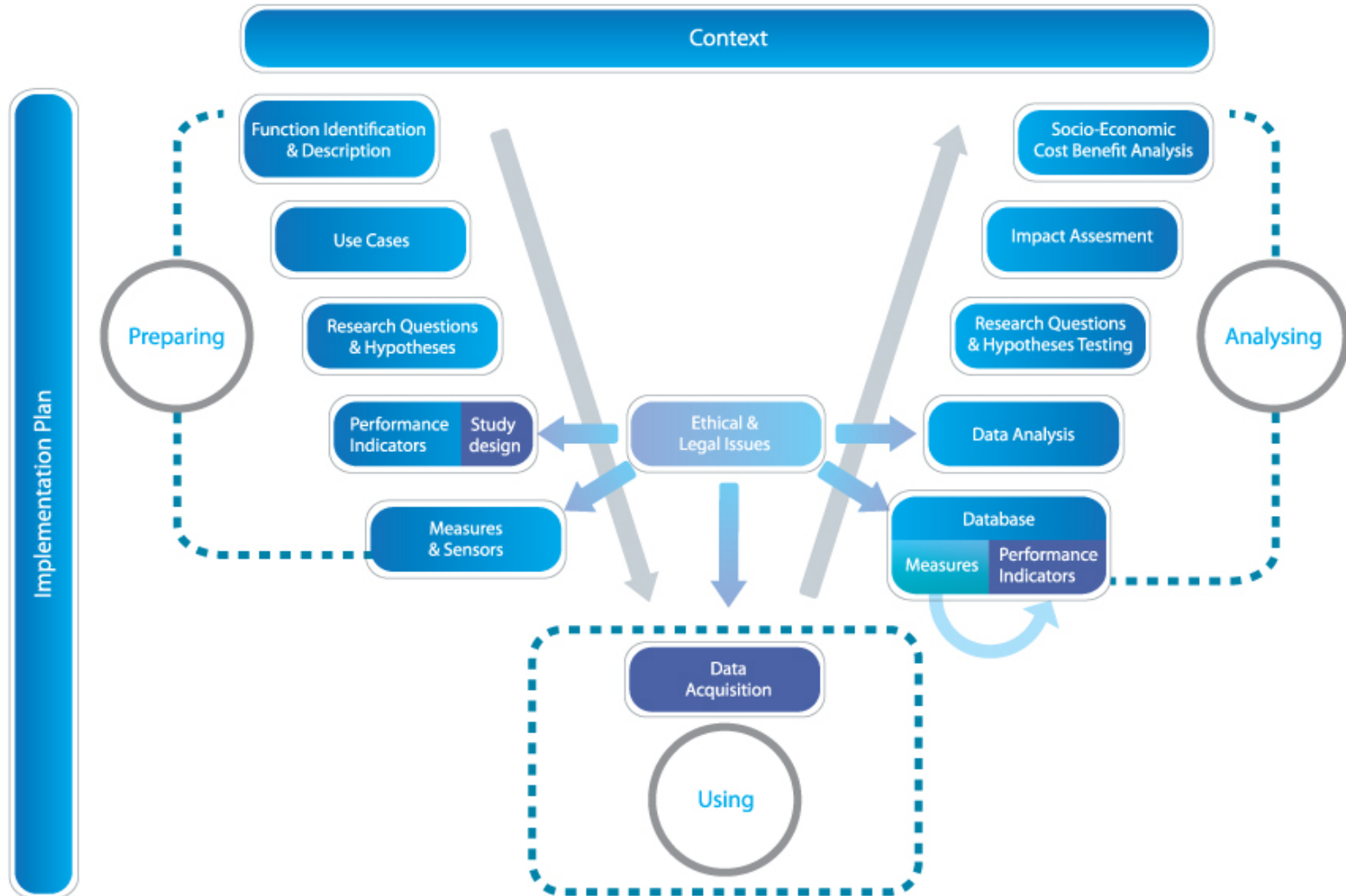
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You may have seen this before



FESTA Handbook

Go from function description

to

Use cases

to

Research questions

to

Hypotheses

Definitions

Research question

A general question to be answered by compiling and testing related specific hypotheses

Hypothesis

A specific statement linking a cause to an effect and based on a mechanism linking the two. It is applied to one or more functions and can be tested with statistical means by analysing specific performance indicators in specific scenarios. A hypothesis is expected to predict the direction of the expected change.

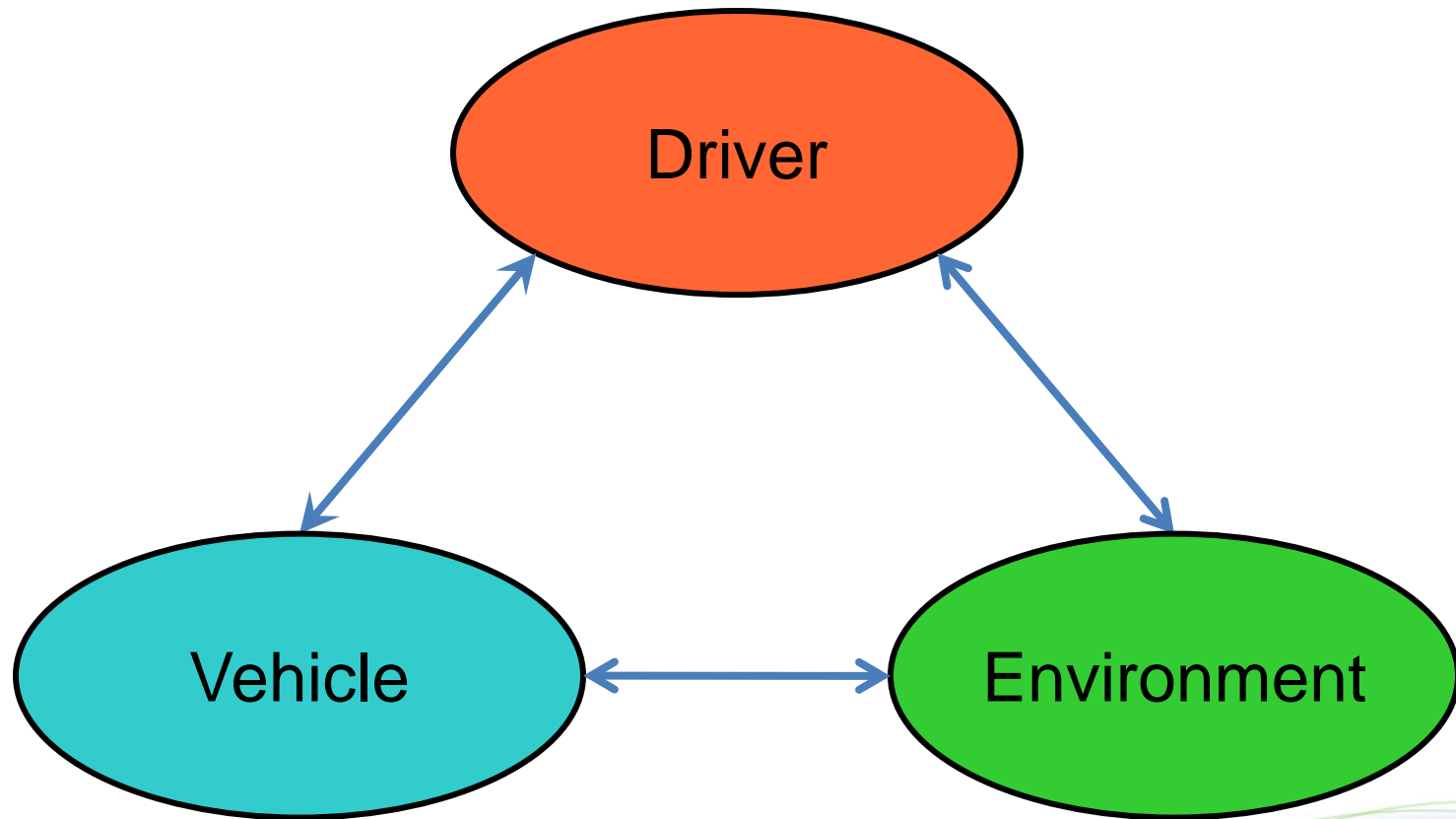
ISA-UK and Lancashire ISA FOTs

- How did we score against FESTA?
 - Probably not very well in terms of doing things formally as proposed by FESTA
 - We did not do things neatly in stages
 - More focussed on research questions than hypotheses
 - A typical RQ would be:
 - How do drivers' attitudes towards speeding and ISA change with experience of ISA?

FOTs: RQs and hypotheses?

- FOTs generally focus on changes in behaviour and hence safety, environment, and efficiency
- So we want to gain an understanding of ***how*** changes occur
- Hence the focus on FESTA on understanding the *mechanism*, i.e. the link between cause and effect

The focus of Naturalistic Driving Studies



NDSs: RQs and hypotheses?

- By contrast NDS focus more on broad understanding of safety and other relationships
- Thus on *why* problems occur (or do not occur) and how drivers manage
- So RQs are the appropriate mechanism for study design

The generation of Research Questions on NDS

- The U.S. SHRP2 NDS has developed more than 400 high-priority RQs to be investigated (Boyle et al., 2012)

A typical RQ for NDS

- Why do young drivers have crash problems especially at night on sharp curves?
- Sub-questions:
 - Do they just drive too fast in general?
 - What is the role of passengers?
 - Do they brake too late?
 - Do they brake suddenly in the curve and hence lose control?
 - Do they have steering jerks?
 - Does it have something to do with curve visual layout, so that they fail to create the necessary safety margin?
 - What is the role of curve and nighttime driving experience?
 - Would ESC provide a solution?

Performance indicators

- Based on the chosen RQs and sub-RQs, we have to specify Performance Indicators and Measures, i.e. the data to be collected
- Then we have to use those Measures in designing the Data Acquisition System

DAS selection



- Finally we have to see what we can afford and decide which areas and RQs we have to cut back on
- That is one of the current UDRIVE problems

Thank you for your attention!
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