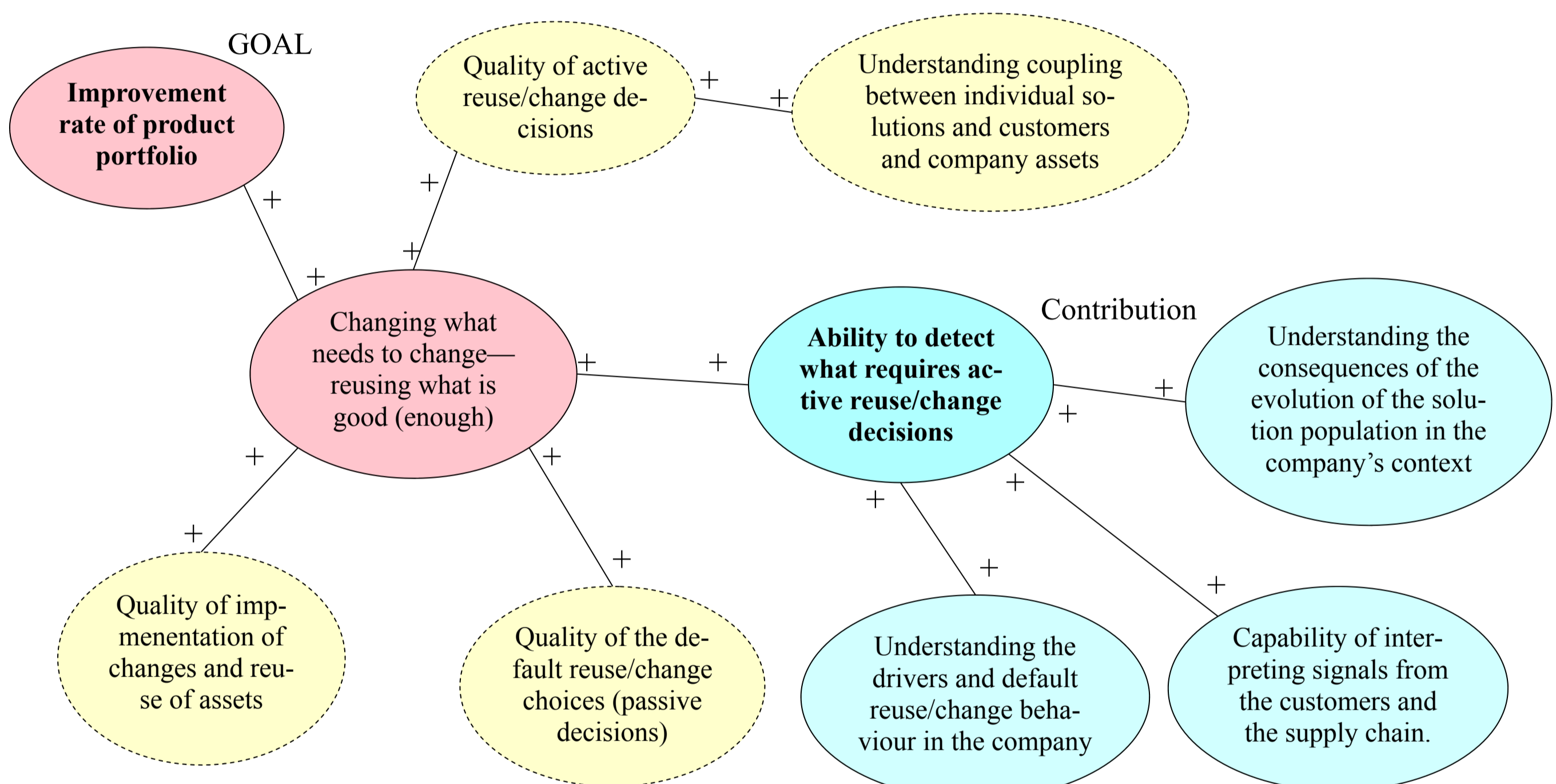


# Controlling the evolution of design solution populations

Many companies are pressed to design and produce frequent successive products at low cost. They benefit from sound asset reuse (e.g. of supply chain, competence) that balances synergies with the need to evolve and offer variety. Much of such asset reuse is decided by the product designers when they choose whether to reuse or change design solutions from one product to another. Since each of these design solutions has potentially intricate relationships to different company assets which may change with time, it is obviously a difficult task to make correct decisions. Furthermore, in many cases where the quantity of all the design solutions overwhelms the product designers, they

can not even make *active* decisions about each of them, but rather must decide passively (not considering alternatives) on many of the solutions. If this combination of active and passive reuse choices goes wrong, it can cause an unwanted evolution of solution populations. Such an unwanted evolution can be, for example, an unmanageable internal variety (expanding population) or stagnation (renewal rate too low). If restarting from scratch is not an option, a pragmatic approach may be needed where the effort of active reuse/change decisions is spent on key design solutions, and the default reuse/change behaviour for the rest of the solutions is approached more generally with policies, tools, etc.



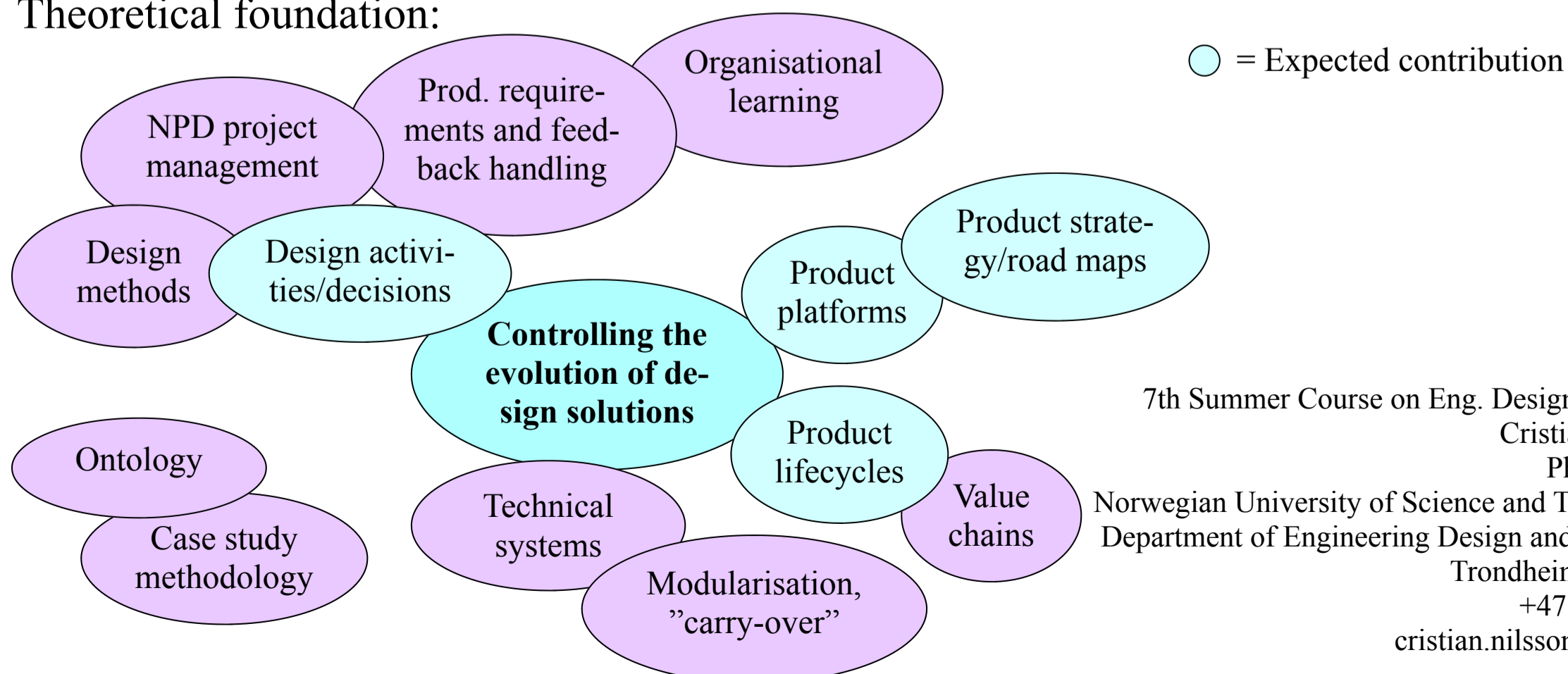
## Research questions

- How can the evolution of design solution populations be modelled?
- Which are the drivers behind reuse and change of design solutions, both from the designer's and from the value chain perspective?

## Research approach

This research is intended primarily to be explorative and descriptive, combining theory, mainly of multi-product development, with case studies of product design activities at manufacturing companies (e.g. automotive).

## Theoretical foundation:



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