PROMPT Software Testing

Testability

SWEDISH ICT SICS

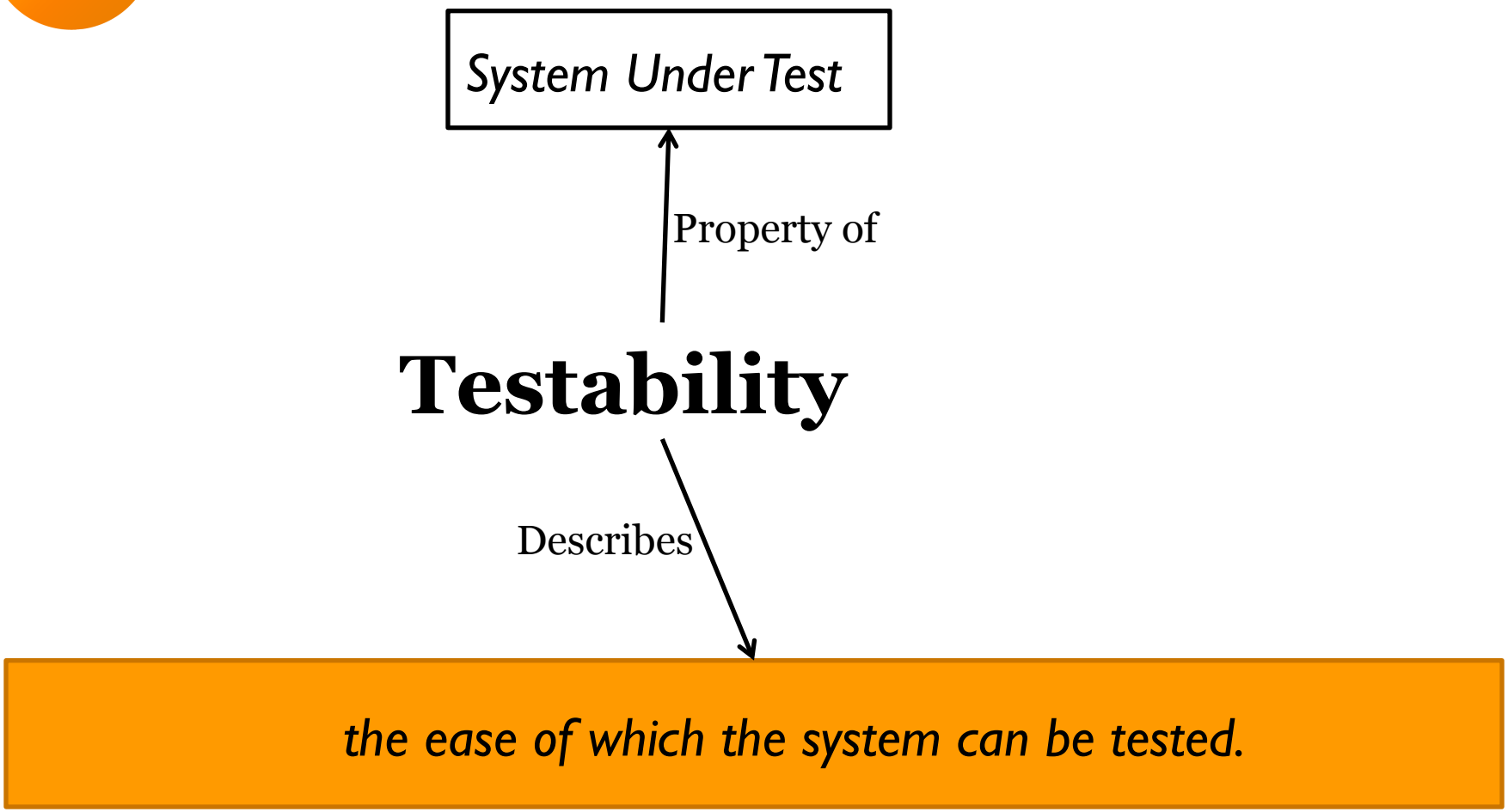
>PROMPT

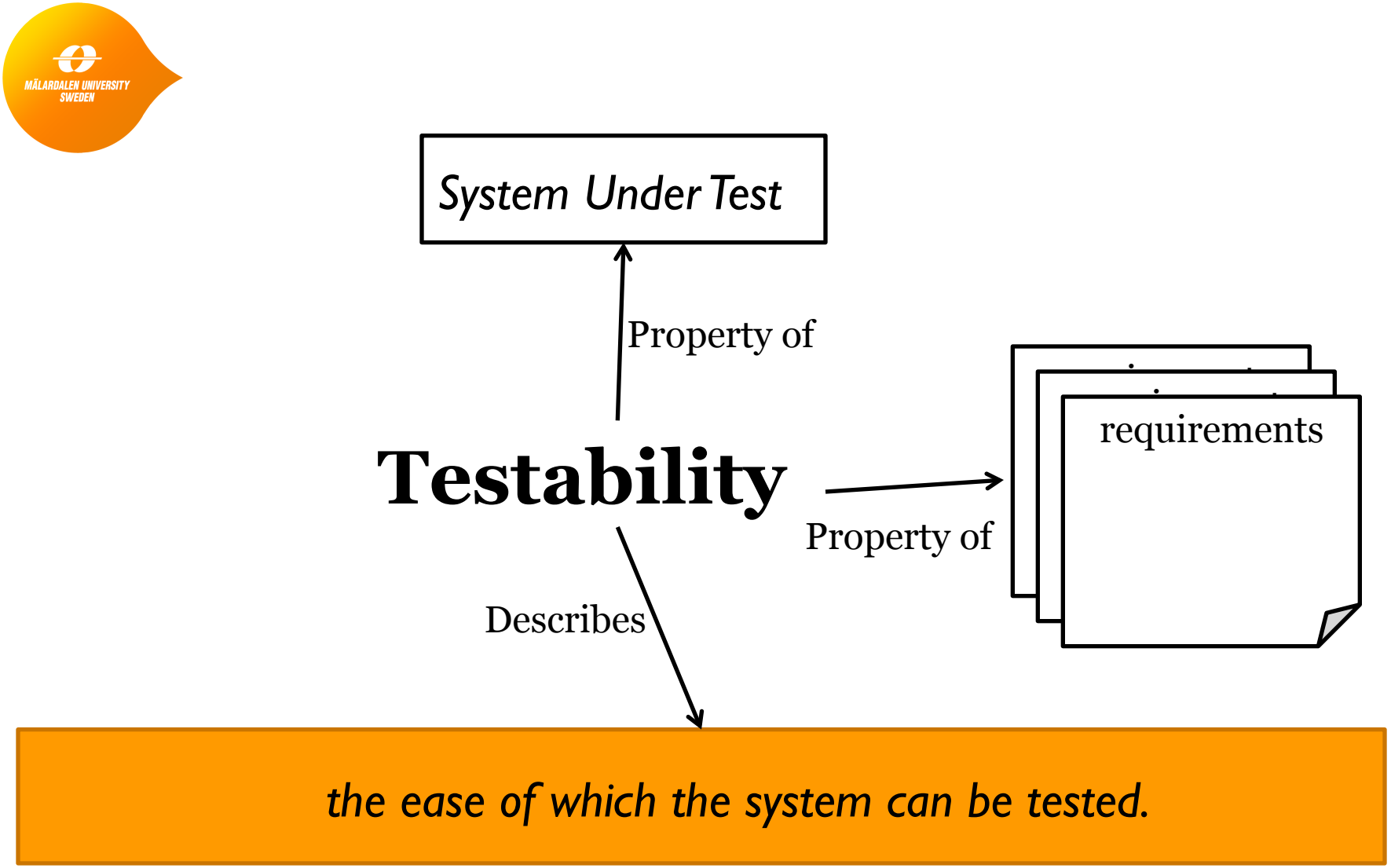
Testability

Testability

Describes

the ease of which the system can be tested.


System Under Test
Property of
Testability
Describes
the ease of which the system can be tested.


System Under Test
Property of
Testability
Property of
requirements
Describes
the ease of which the system can be tested.

Testability

*"**Testability,** a property applying to an empirical hypothesis, involves two components:*
*(1) the **logical property** that is variously described as contingency, defeasibility, or falsifiability, which means that counterexamples to the hypothesis are logically possible, and*
*(2) the **practical feasibility** of observing a reproducible series of such counterexamples if they do exist."*

- Wikipedia

Testability

Falsifiability

How easy can a requirement be evaluated ?

Testability

Falsifiability

How easy can a requirement be evaluated ?

BAD Example:
Our system should be user-friendly!

Testability

Falsifiability

How easy can a requirement be evaluated ?

GOOD Example:
Our System should respond within 3ms!

BAD Example:
Our system should be user-friendly!

Testability

Falsifiability
Observability (I)

The likelihood of executing and detecting the bugs that exist in the software using random inputs

Testability

Falsifiability
Observability (I)

The likelihood of executing and detecting the bugs that exist in the software using random inputs

A motivation:
What you have not executed, you cannot observe no matter how much you look at it!

Testability

Falsifiability
Observability (I)

The likelihood of executing and detecting the bugs that exist in the software using random inputs

A consequence:

Complex software → low observability

Testability

Falsifiability

Observability (II)

To what extent the internal state of a system can be determined by observing its outputs

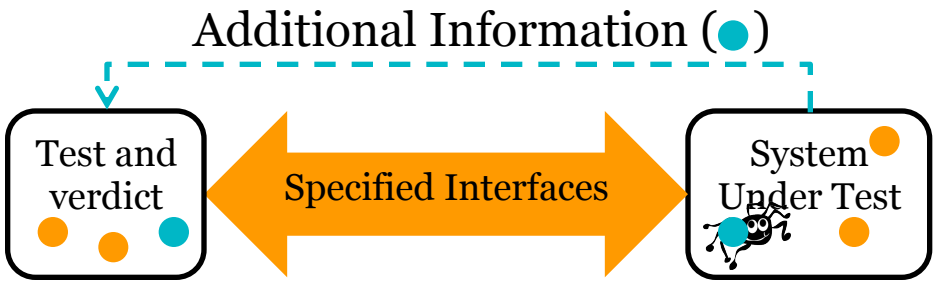
Testability

Falsifiability

Observability (II)

To what extent the internal state of a system can be determined by observing its outputs

Testability

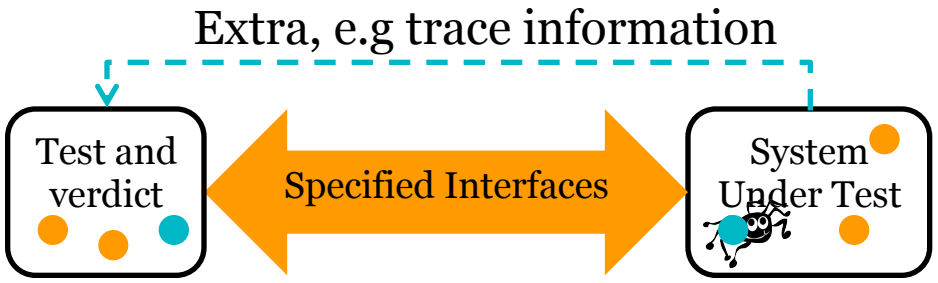


Falsifiability

Observability (II)

To what extent the internal state of a system can be determined by observing its outputs

Testability



Falsifiability

Observability (II)

To what extent the internal state of a system can be determined by observing its outputs

Richer output and state information → higher observability

Testability

Falsifiability
Observability
Reproducibility

Controllability

Deteriminism

A test that fails once should always fail in the same way

Summary

- Testable requirements
- Make your system observable
- Try to keep complexity at bay
- Reduce non-determinism