



Software Development in Science

19/20 November 2019 | Guido Trench, Wouter Klijn (JSC, SimLab Neuroscience)

MOTIVATION

Motivation

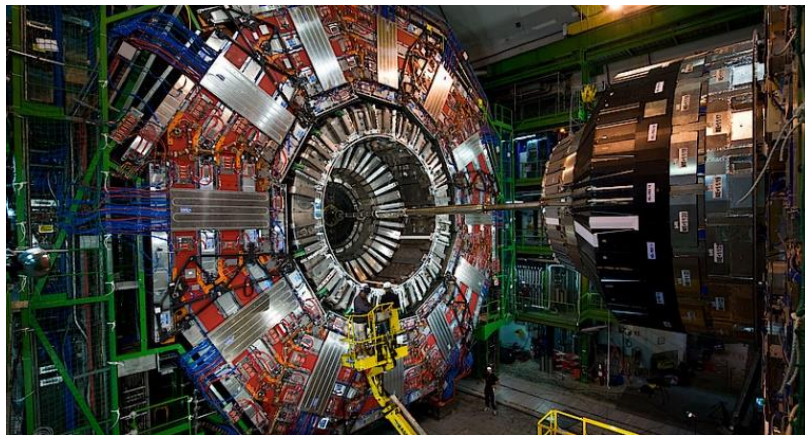
- Scientific **research** increasingly **relies on software**.
- To get a **reliable outcome** formalized processes are required, especially when developing software in teams.
- Thus, formal education and training in **software development methodologies** become more important.
- “**Agile methods**” is the (new) paradigm.
- **Software Engineering** plays a key role in the production of software.

Scientific research has yet to absorb knowledge of these methodologies from fields in which they are common practice.

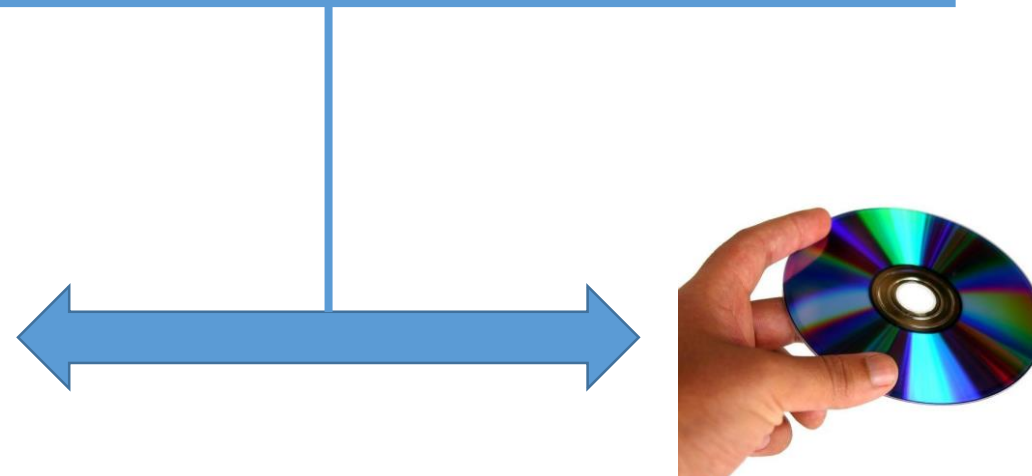
A VERY BRIEF INTRODUCTION TO SOFTWARE ENGINEERING

Software can be as complex as human brains can design.

Apply engineering methods to the production of software.



CMS, LHC Cern



*„Software engineering is managing the complexity
in software development.“*

Introduction to Software Engineering

Software engineering body of knowledge: **15 Knowledge Areas** and **7 Related Disciplines**.

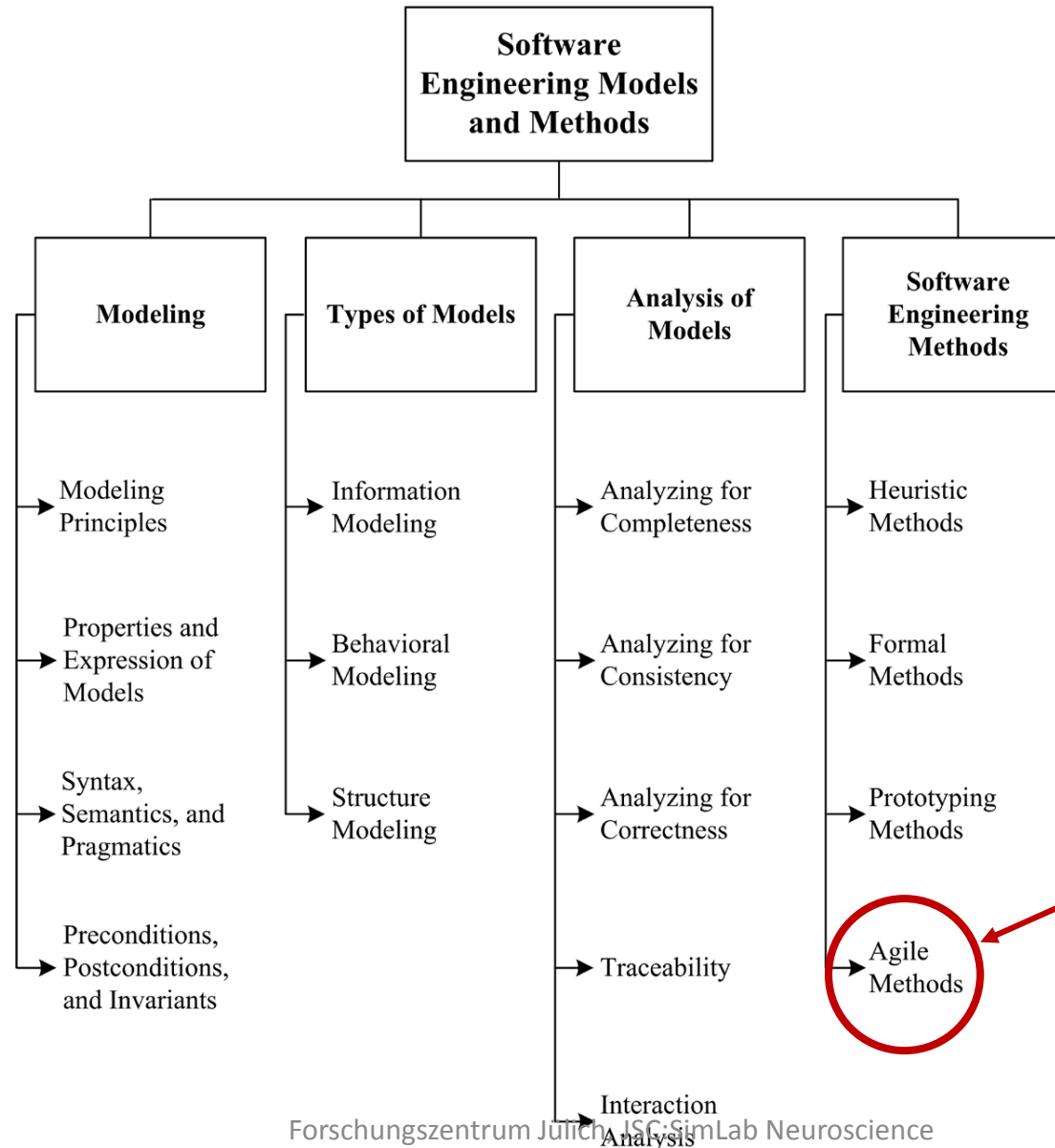
Knowledge Areas	Related Disciplines
<ul style="list-style-type: none"> • Software Requirements • Software Design • Software Construction • Software Testing • Software Maintenance • Software Configuration Management • Software Engineering Management • Software Engineering Process • Software Engineering Models and Methods • Software Quality • Software Engineering Professional Practice • Software Engineering Economics • Computing Foundations • Mathematical Foundations • Engineering Foundations 	<ul style="list-style-type: none"> • Computer Engineering • Computer Science • General Management • Mathematics • Project Management • Quality Management • Systems Engineering

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Introduction to Software Engineering

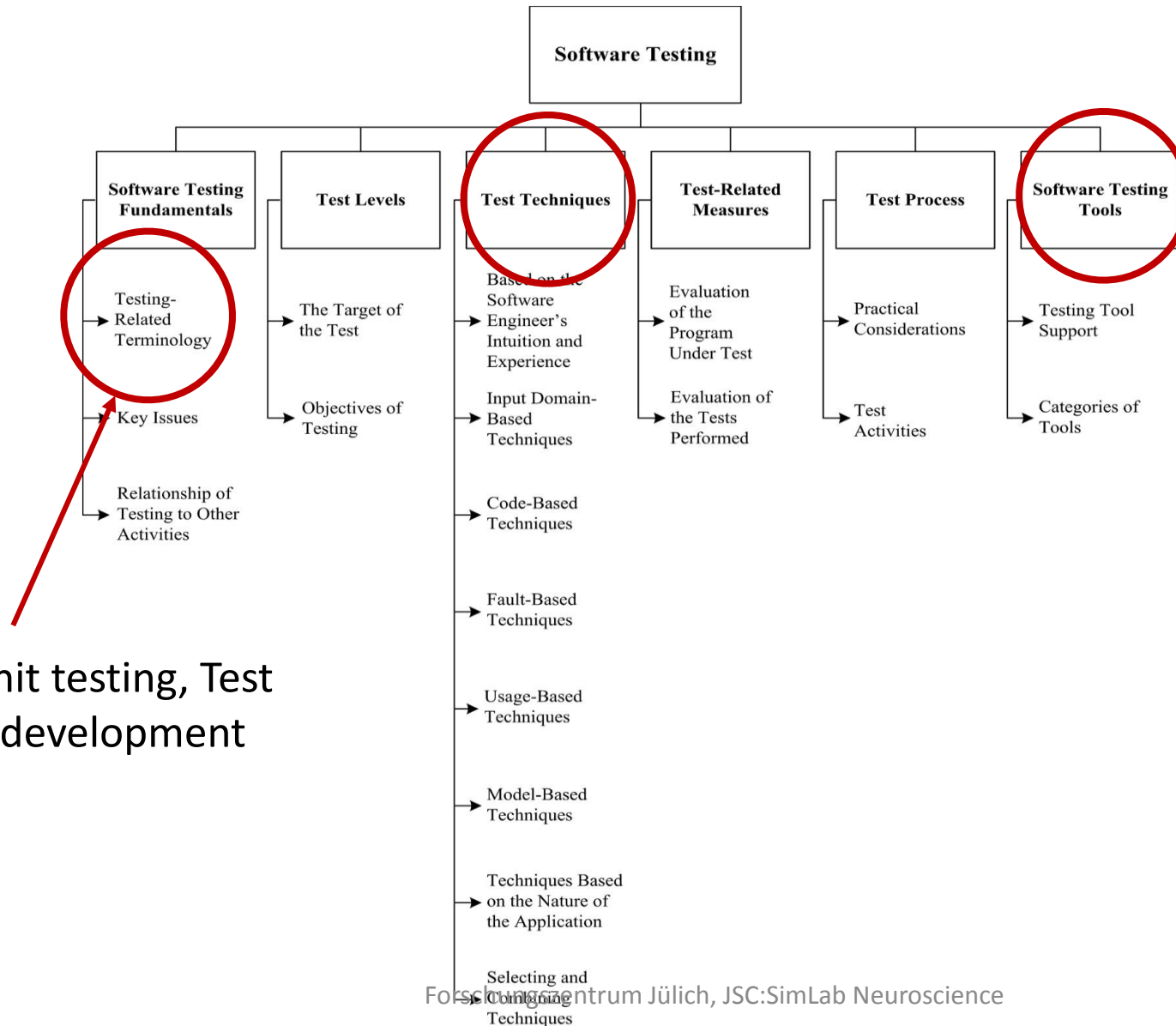


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Introduction to Software Engineering

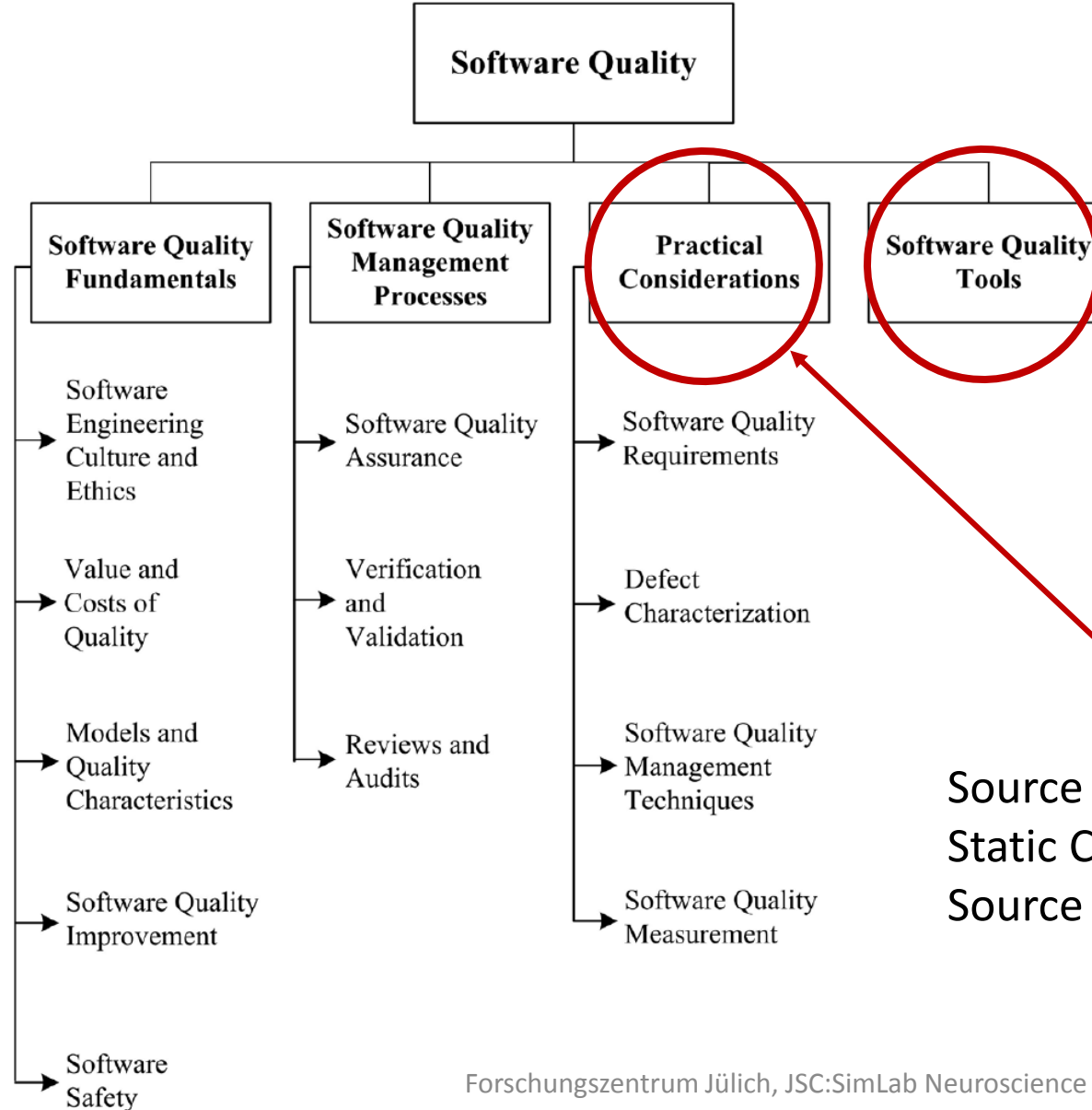


e.g., Unit testing, Test driven development (TD)

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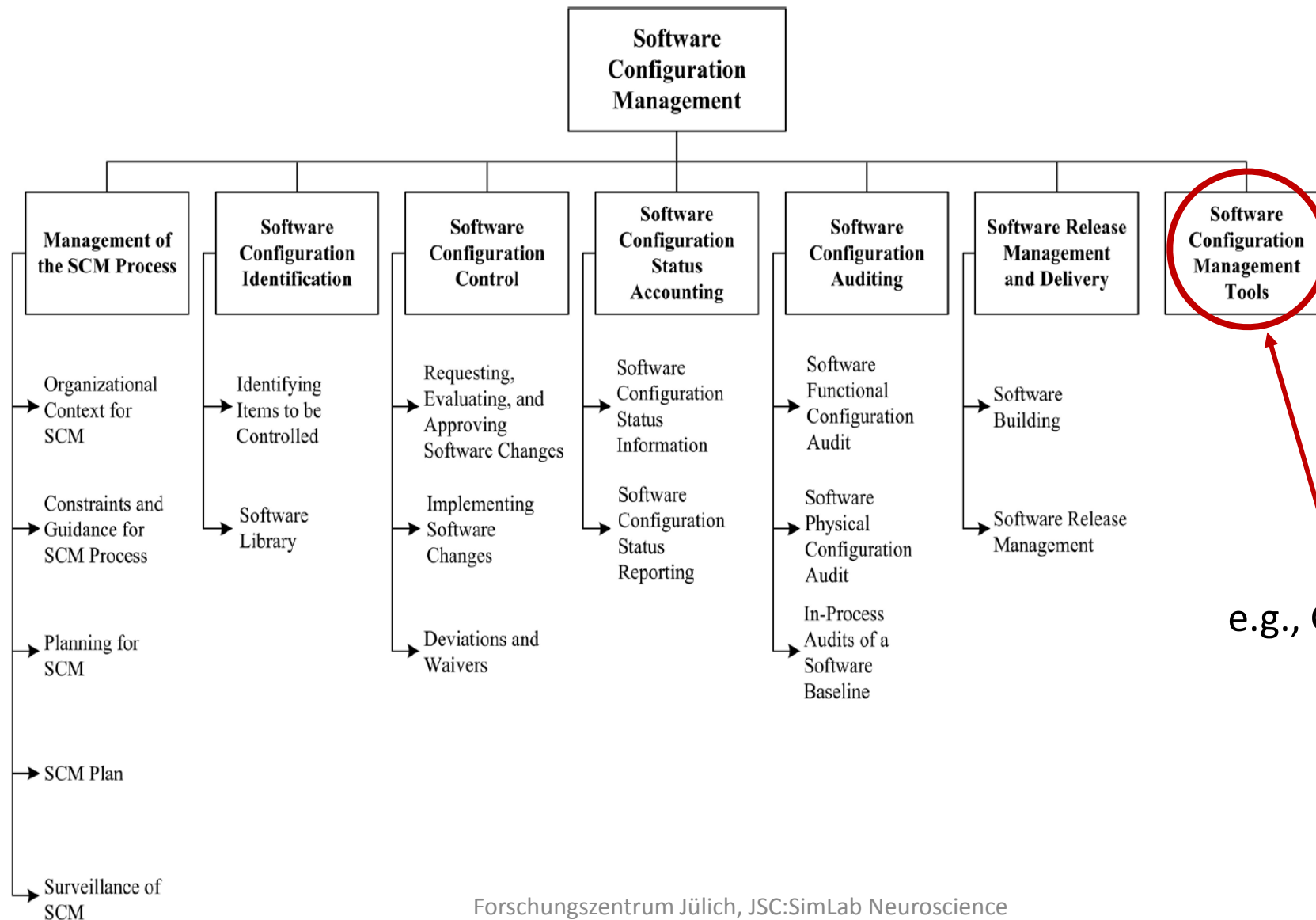
Source Code Quality, Clean Code,
Static Code Analysis Tools and
Source Code Formatting

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Introduction to Software Engineering



The possibly most comprehensive book.

<http://iansommerville.com/software-engineering-book/>

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