



**SWEBOK**

ÉTS

UQÀM

# *Development of An International Consensus on the Software Engineering Body of Knowledge*

**Alain Abran**

**P. Bourque, R. Dupuis, J. W. Moore, L. Tripp**

Extraido de conferencia en la Universidad de Alcala,  
Junio 2005

1



**Corporate Support by:**



CANADIAN COUNCIL OF PROFESSIONAL ENGINEERS  
CONSEIL CANADIEN DES INGÉNIEURS



National Research  
Council Canada

Conseil national  
de recherches Canada



**Project managed by:**



2

# **Guide to the Software Engineering Body of Knowledge (SWEBOK®)**

---

- ⦿ Began as a collaboration among IEEE CS, ACM and the Université du Québec à Montréal
  - ⦿ International participation from industry, professional societies, standards bodies, academia, authors
  - ⦿ Over 500 hundred software engineering professionals have touched the document
  - ⦿ Release of Trial Version in 2001
- ® Registered in U.S. Patent Office

3

## **2004 SWEBOK Guide**

- ⦿ Available on [www.swebok.org](http://www.swebok.org)
- ⦿ The 2004 Version was endorsed by the project's Industrial Advisory Board in January 2004 and approved by the IEEE Computer Society Board of Governors in February 2004
- ⦿ In May 2005, published in book format by the IEEE Computer Society Press
- ⦿ To be published as ISO Technical Report 19759

4

# List of Knowledge Areas

---

- ⦿ Software Requirements
- ⦿ Software Design
- ⦿ Software Construction
- ⦿ Software Testing
- ⦿ Software Maintenance
- ⦿ Software Configuration Management
- ⦿ Software Quality
- ⦿ Software Engineering Tools & Methods
- ⦿ Software Engineering Process
- ⦿ Software Engineering Management

5

## What is Software Engineering?

---

- ⦿ IEEE 610.12\*:
  - ❖ “(1) The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software.
  - ❖ (2) The study of approaches as in (1).”

\* IEEE Standard Glossary of Software Engineering Terminology, 1990.

6

# Recognized Profession?

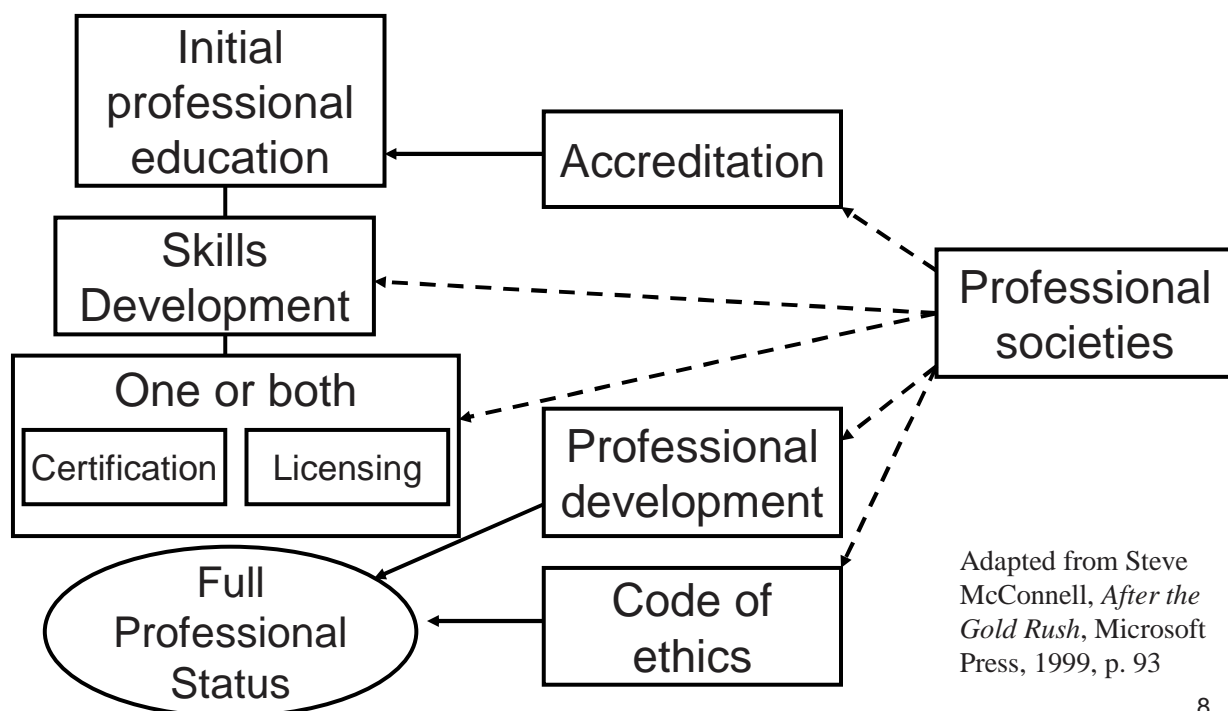
## ⊙ Starr\*:

- ❖ Knowledge and competence: validated by the community of peers
- ❖ Consensually validated knowledge: rests on rational, scientific grounds
- ❖ Judgment and advice: oriented toward a set of substantive values

\* P. Starr, *The Social Transformation of American Medicine*: BasicBooks, 1982.

7

# Development of a Profession



Adapted from Steve McConnell, *After the Gold Rush*, Microsoft Press, 1999, p. 93

8

# Project Objectives

---

- ⦿ Characterize the contents of the Software Engineering Body of Knowledge
- ⦿ Provide a topical access to the Software Engineering Body of Knowledge
- ⦿ Promote a consistent view of software engineering worldwide

9

# Project Objectives

---

- ⦿ Clarify the place of, and set the boundary of, software engineering with respect to other disciplines (computer science, project management, computer engineering, mathematics, etc.)
- ⦿ Provide a foundation for curriculum development and individual certification and licensing material

10

# Intended Audience

---

- ⦿ Public and private organizations
- ⦿ Practicing software engineers
- ⦿ Makers of public policy
- ⦿ Professional societies
- ⦿ Software engineering students
- ⦿ Educators and trainers

11

# What Was Out of Scope?

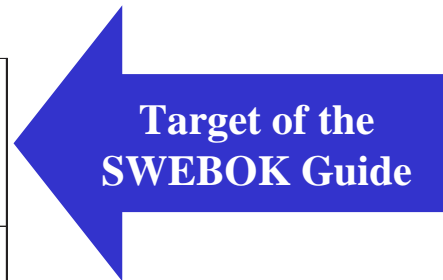
---

- ⦿ Not a curriculum development effort!
- ⦿ Not an all-inclusive description of the sum of knowledge in the field
- ⦿ Not all categories of knowledge

12

# Categories of Knowledge in the SWEBOK

<b>Specialized</b>	<b>Generally Accepted</b>
	<b>Advanced and Research</b>



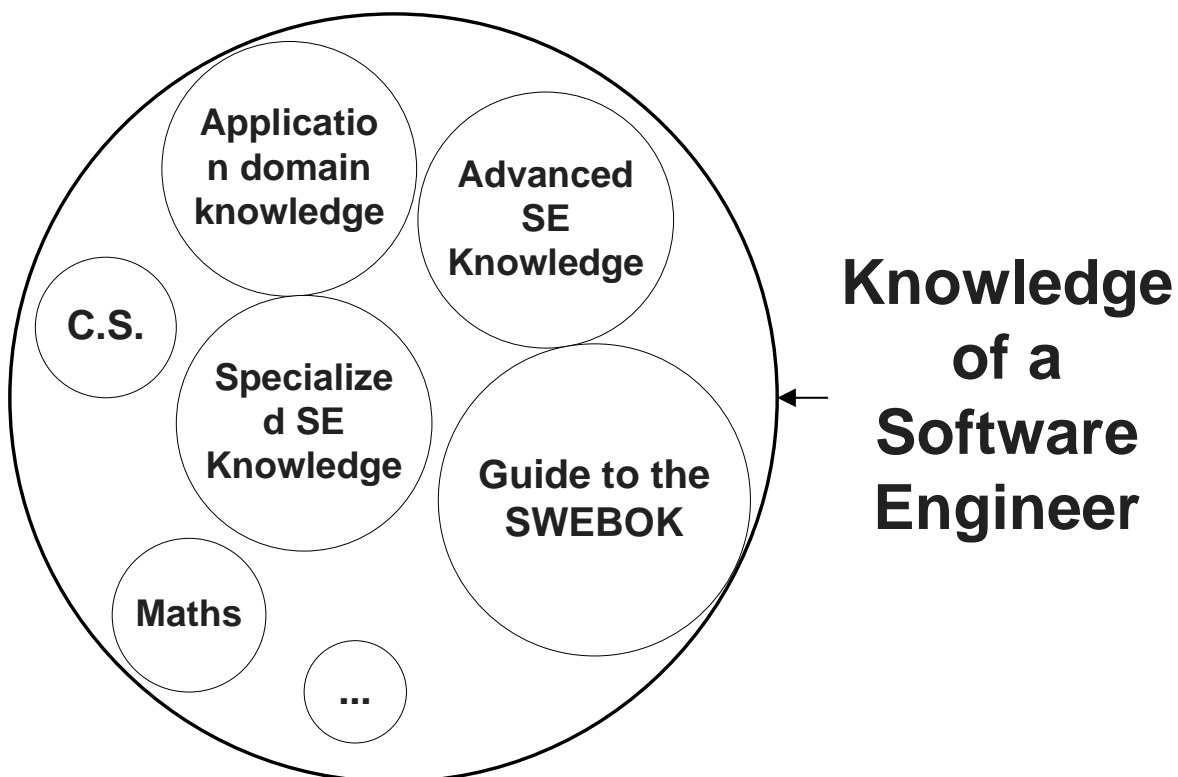
**Target of the SWEBOK Guide**

«Applicable to most projects, most of the time, and widespread consensus about their value and usefulness»

Project Management Institute - PMI

- ⊙ North American Bachelor's degree + 4 years of experience

13



14

# Deliverables:

---

- ⊙ **Consensus** on a list of Knowledge Areas
- ⊙ **Consensus** on a list of **topics and relevant reference materials** for each Knowledge Area
- ⊙ **Consensus** on a list of Related Disciplines

15

## Knowledge Areas and Related Disciplines

---

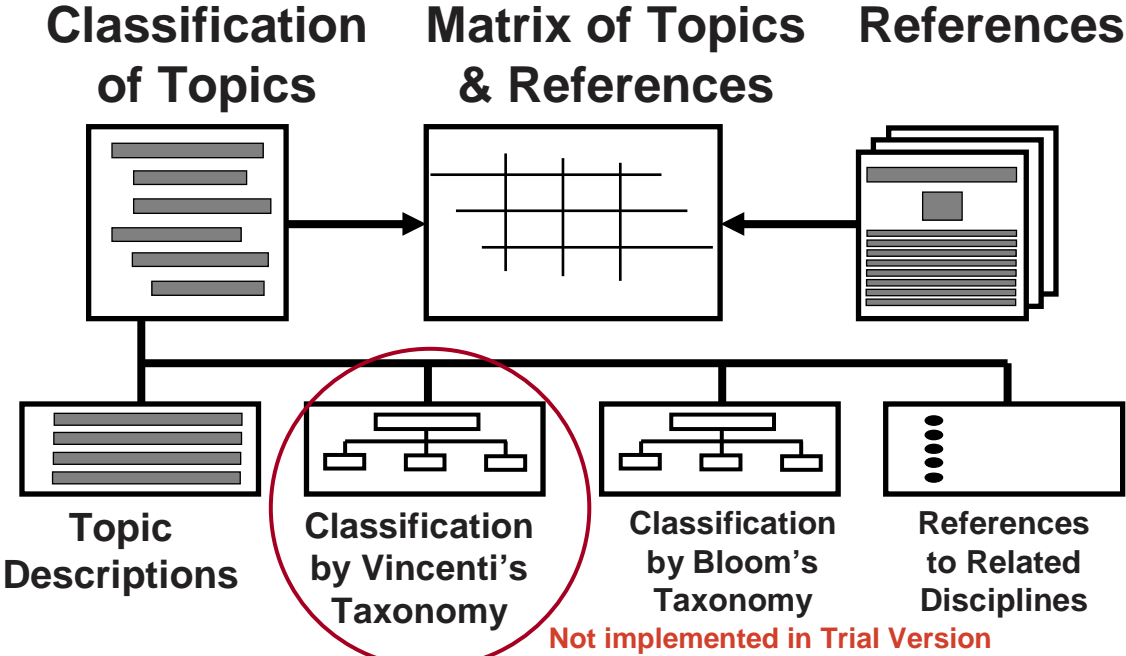
- ⊙ Software Requirements
- ⊙ Software Design
- ⊙ Software Construction
- ⊙ Software Testing
- ⊙ Software Maintenance
- ⊙ Software Configuration Management
- ⊙ Software Eng. Management
- ⊙ Software Eng. Tools & Methods
- ⊙ Software Engineering Process
- ⊙ Software Quality

### *Related Disciplines*

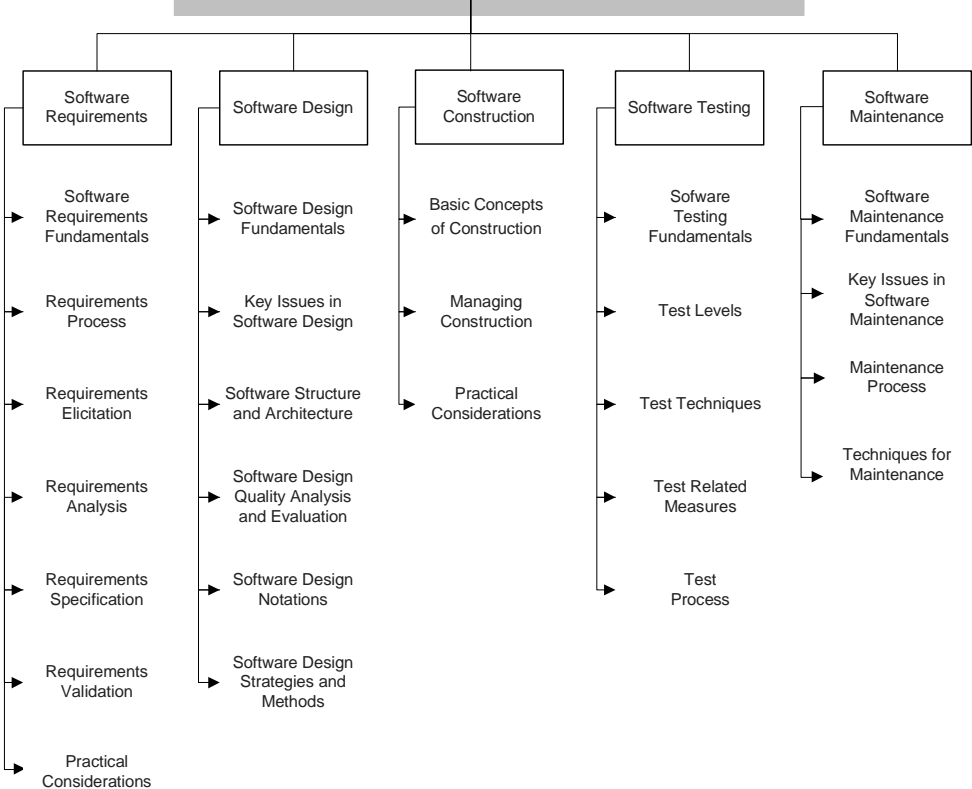
- Computer Engineering
- Computer Science
- Mathematics
- Project Management
- Management
- Quality Management
- Software Ergonomics
- Systems Engineering

16

# Knowledge Area Description

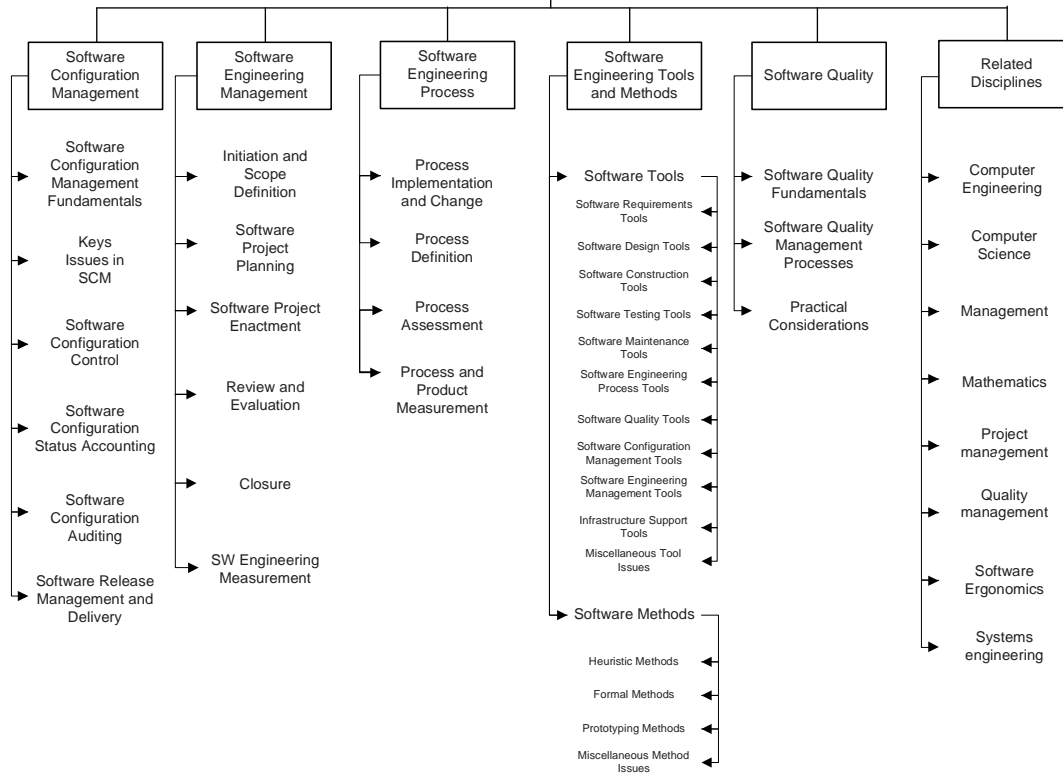


## Guide to the Software Engineering Body of Knowledge 2004 Version

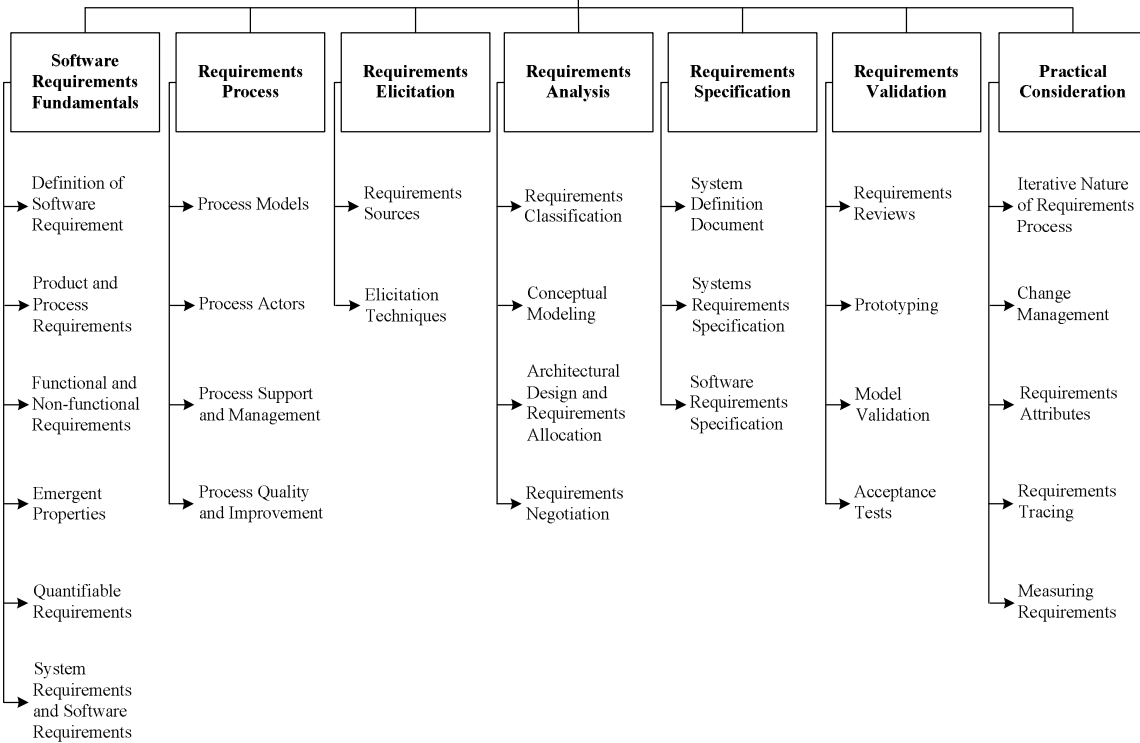


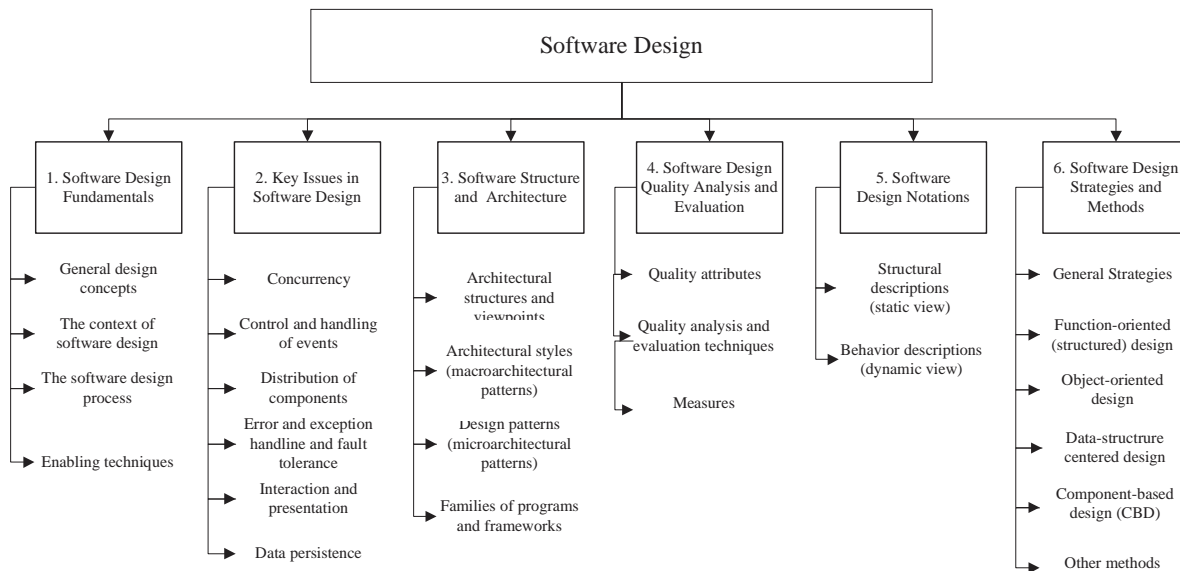
# Guide to the Software Engineering Body of Knowledge

(2004 Version)

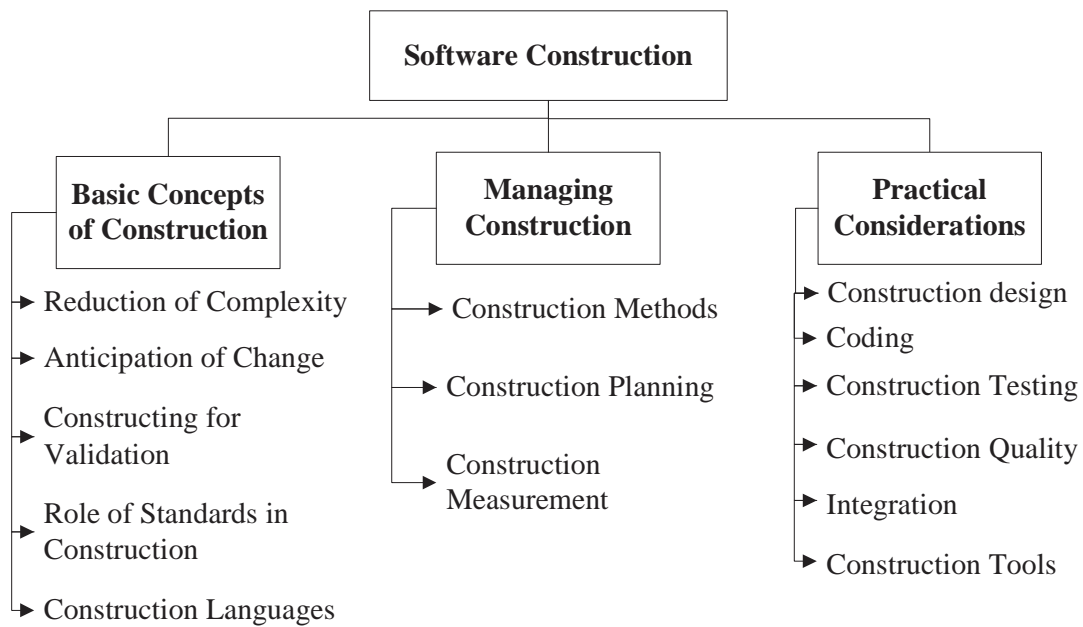


## Software Requirements

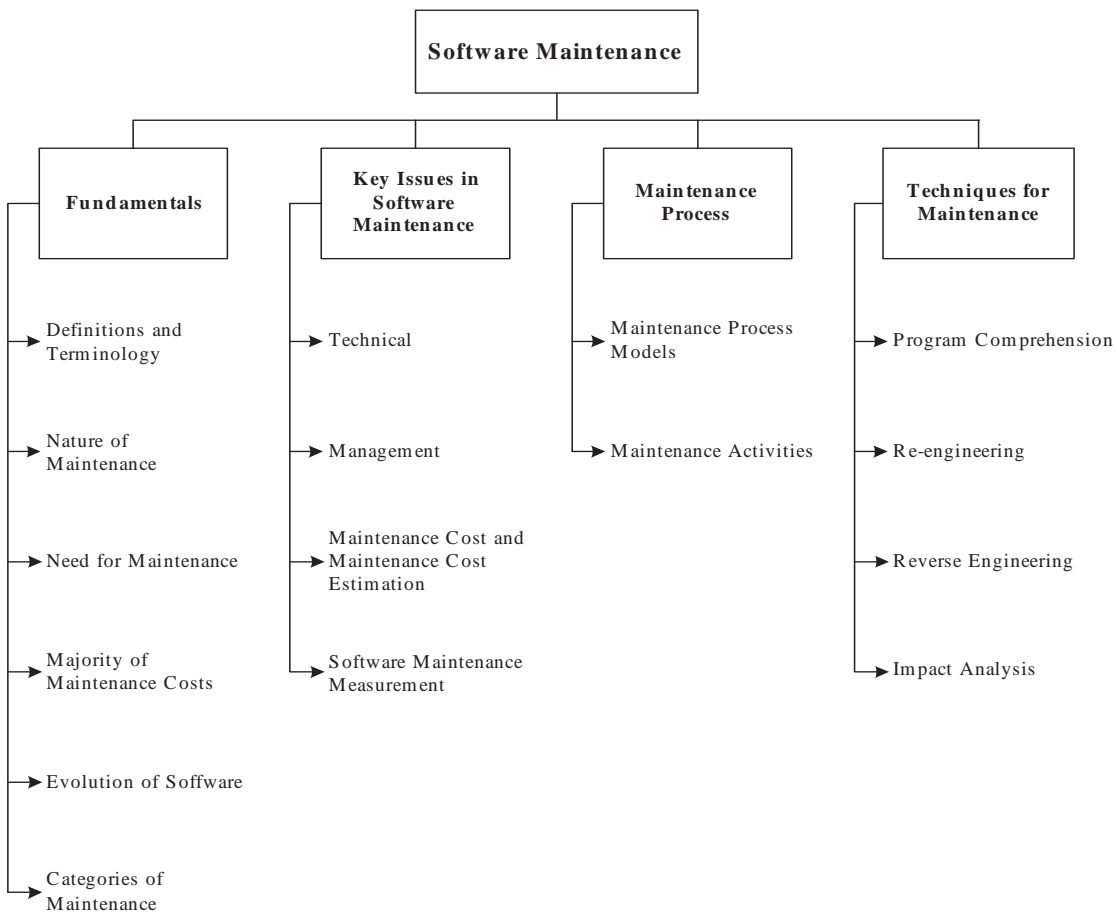
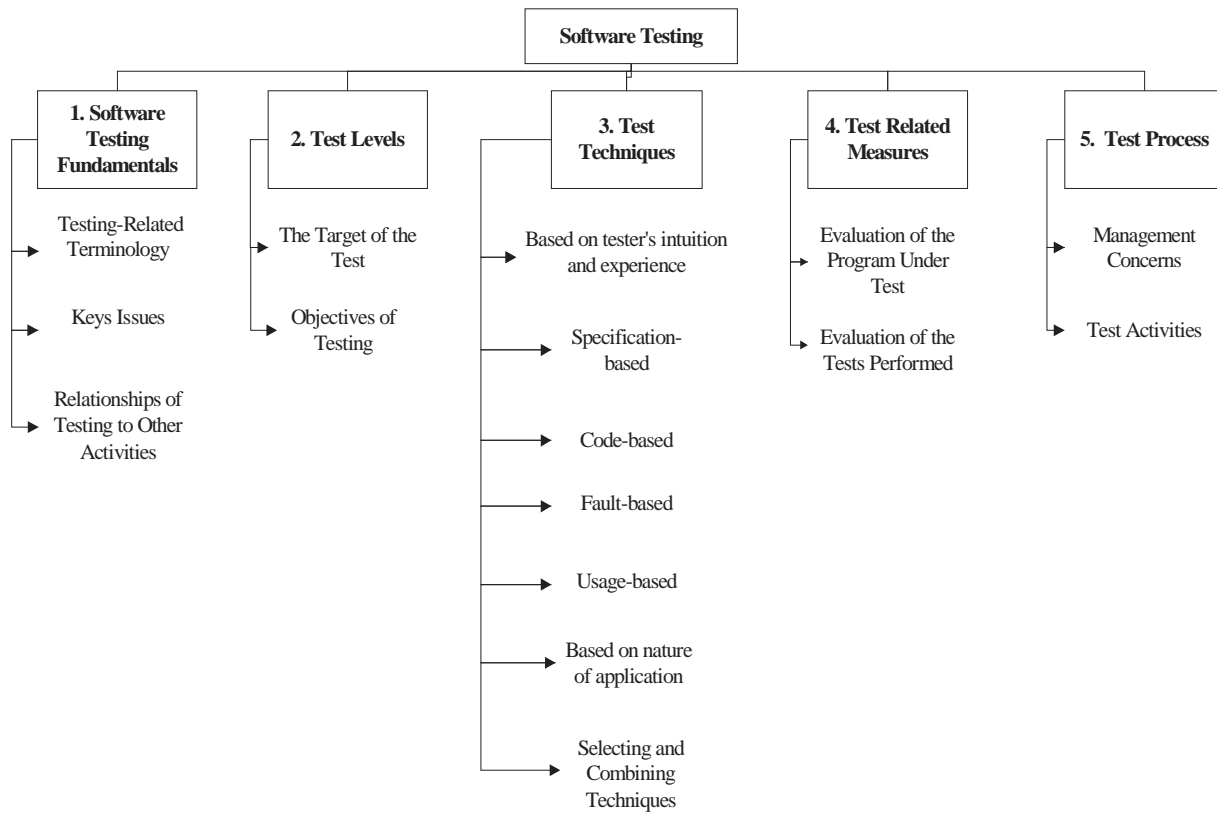


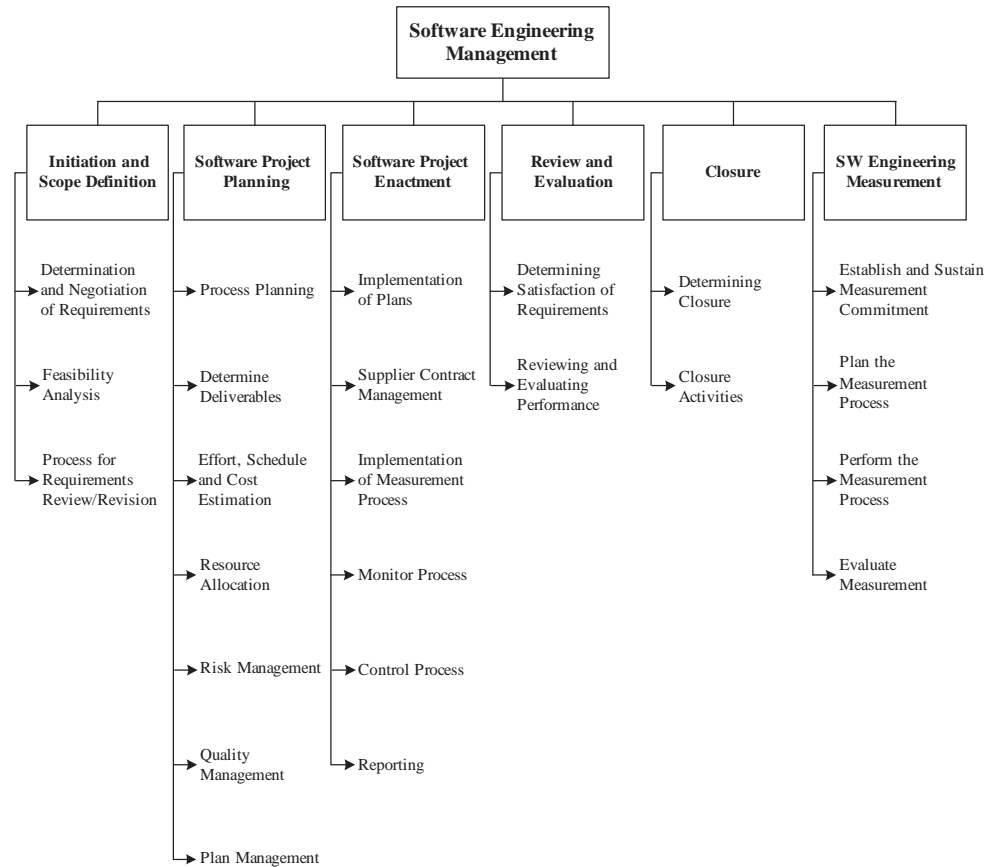
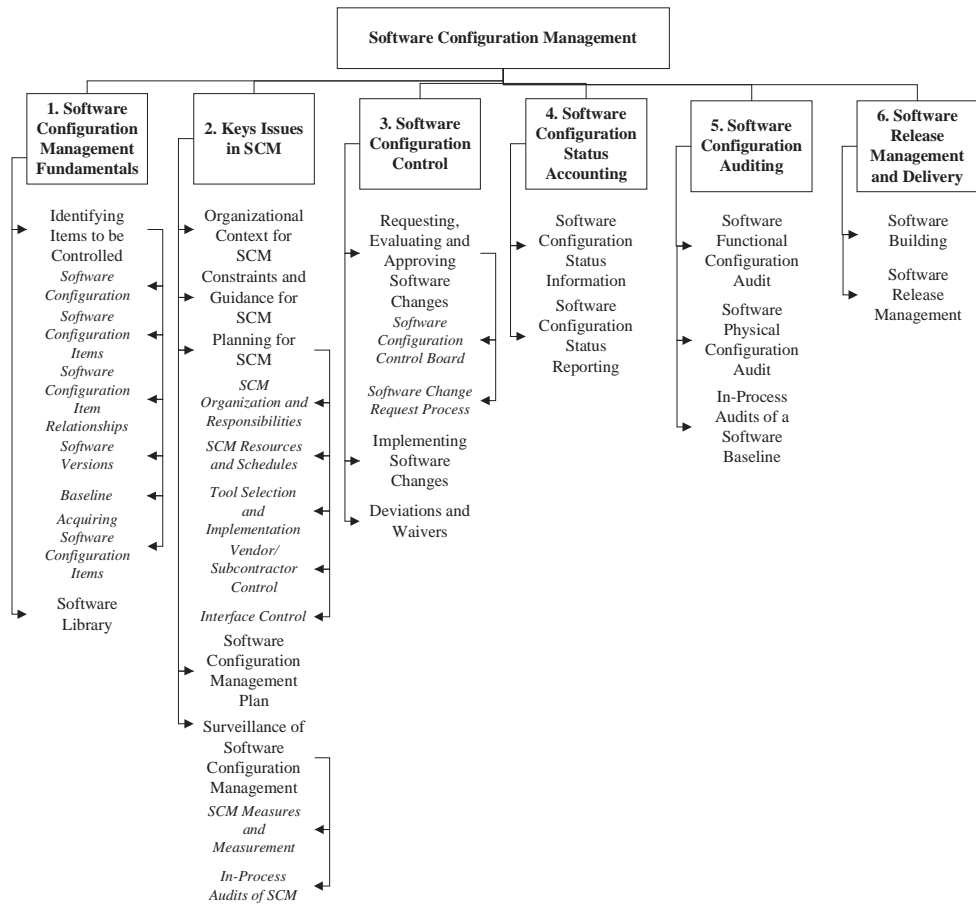


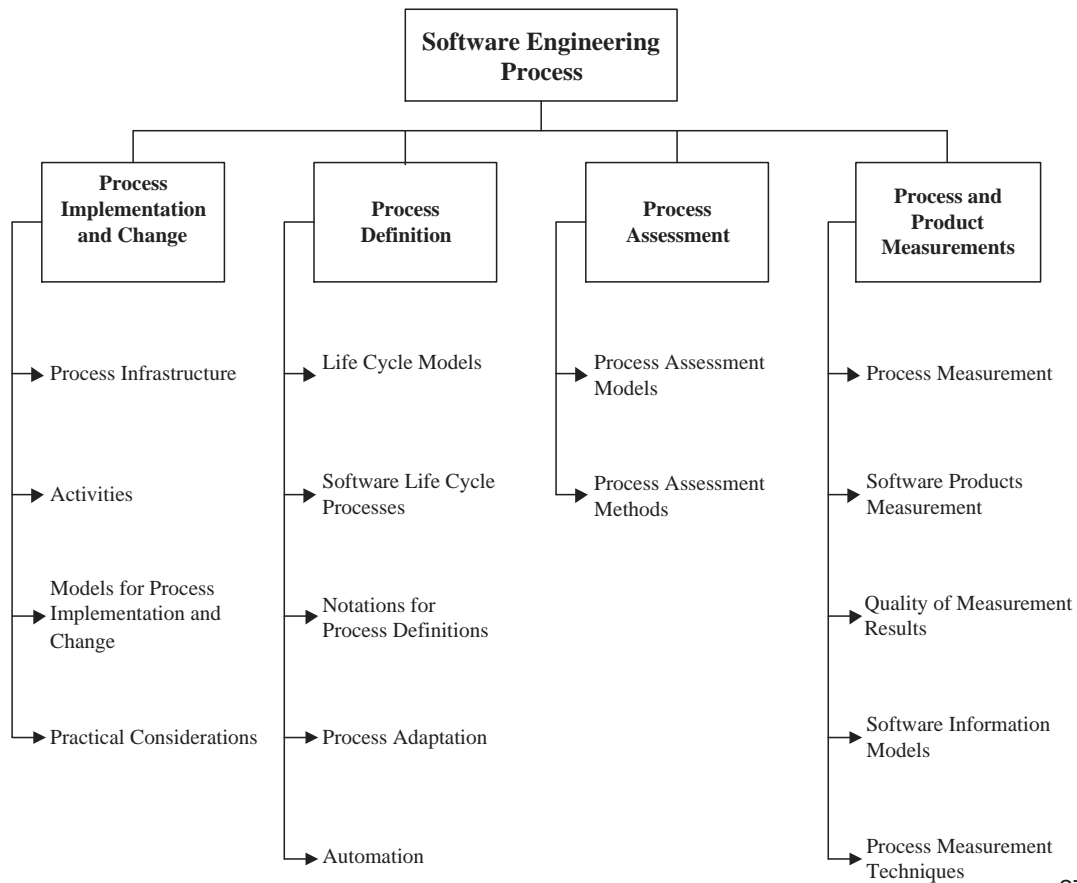
**Figure 1** Breakdown of topics for the Software Design KA



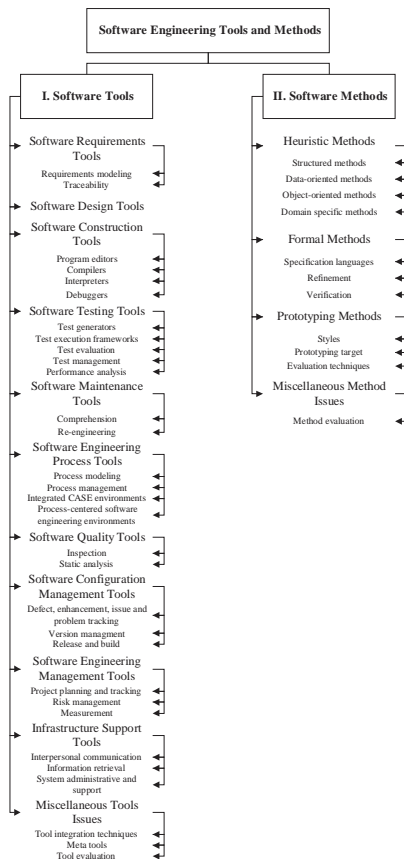
**Figure 1.** Breakdown of topics for the Software Construction KA.

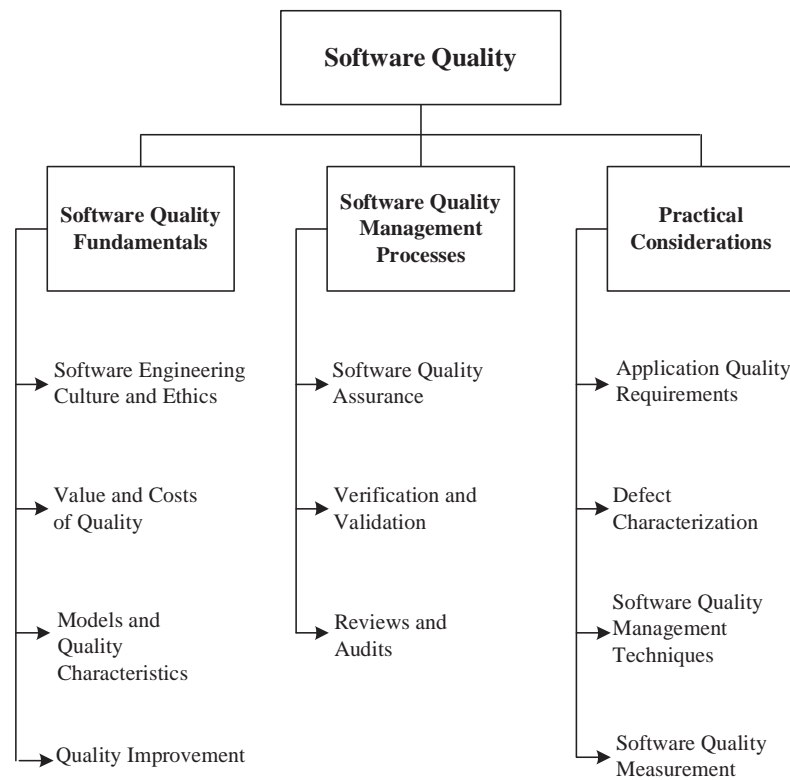






# Software Engineering Tools and Methods





## Applications of the Guide

- ⊙ **Industry & Government**
  - ❖ **Career planning**
    - Construx
  - ❖ **Inter-company benchmarking**
  - ❖ **Hiring**
  - ❖ **Job and role descriptions**
    - Bombardier Transportation
  - ❖ **Policy making**
    - Turkish Industry Survey, Alberta Software Testing Survey

# Applications of the Guide

---

- ⊙ Professional development
  - ❖ Security Industry Automation Corporation
  - ❖ SAP, Boeing Australia
  - ❖ <http://www.software-kompetenz.de>

31

# Applications of the Guide

- ⊙ Education
  - ❖ Course Design/Assessment:
    - École de technologie supérieure
  - ❖ Program Design/Assessment:
    - CRISTEL project
    - National Technological University
    - Monash University – see <http://www.csse.monash.edu.au/~doit/cgi-bin/live/index.php.cgi>

32

# Applications of the Guide

---

- ⦿ Licensing & Certification
  - ❖ IEEE CS CSDP
  - ❖ Ordre des ingénieurs du Québec

33

# Concluding Remarks

---

- ⦿ Consensus on the core body of knowledge is key in all disciplines and pivotal for the evolution toward a professional status

34

**[www.swebok.org](http://www.swebok.org)**