



Faculty of Computers and Information  
Software Engineering Program (JMSE)



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# Software Evolution : TOC

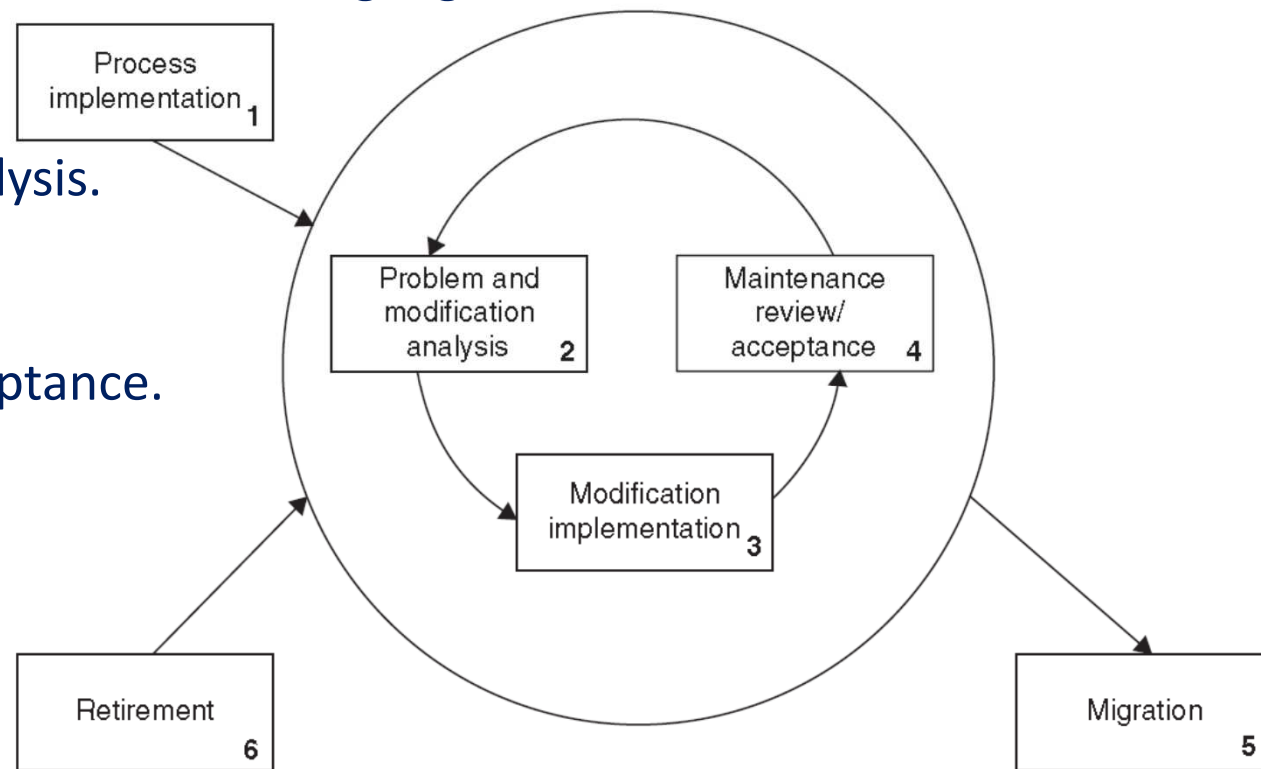
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1. Introduction to Software Evolution
2. Taxonomy of Software Maintenance and Evolution
3. Evolution and Maintenance Models – Configuration Management
4. Reuse and Domain Engineering
5. Program Comprehension
6. Impact Analysis
7. Refactoring
8. Reengineering
9. Legacy Information Systems

# ISO/IEC 14764 Maintenance Process

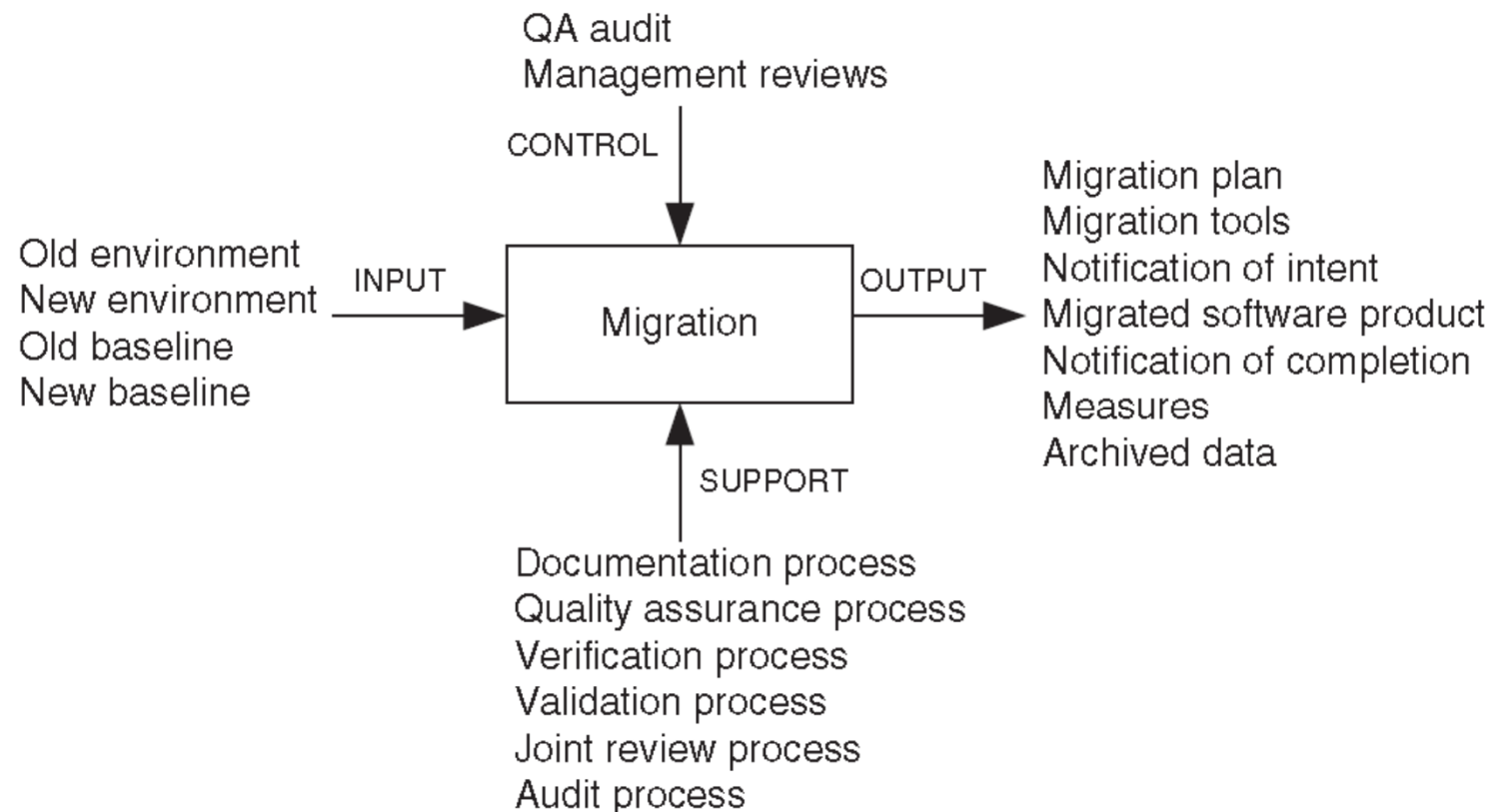
The maintenance process comprises the following high level activities:

1. Process Implementation.
2. Problem and Modification Analysis.
3. Modification Implementation.
4. Maintenance Review and Acceptance.
5. Migration.
6. Retirement



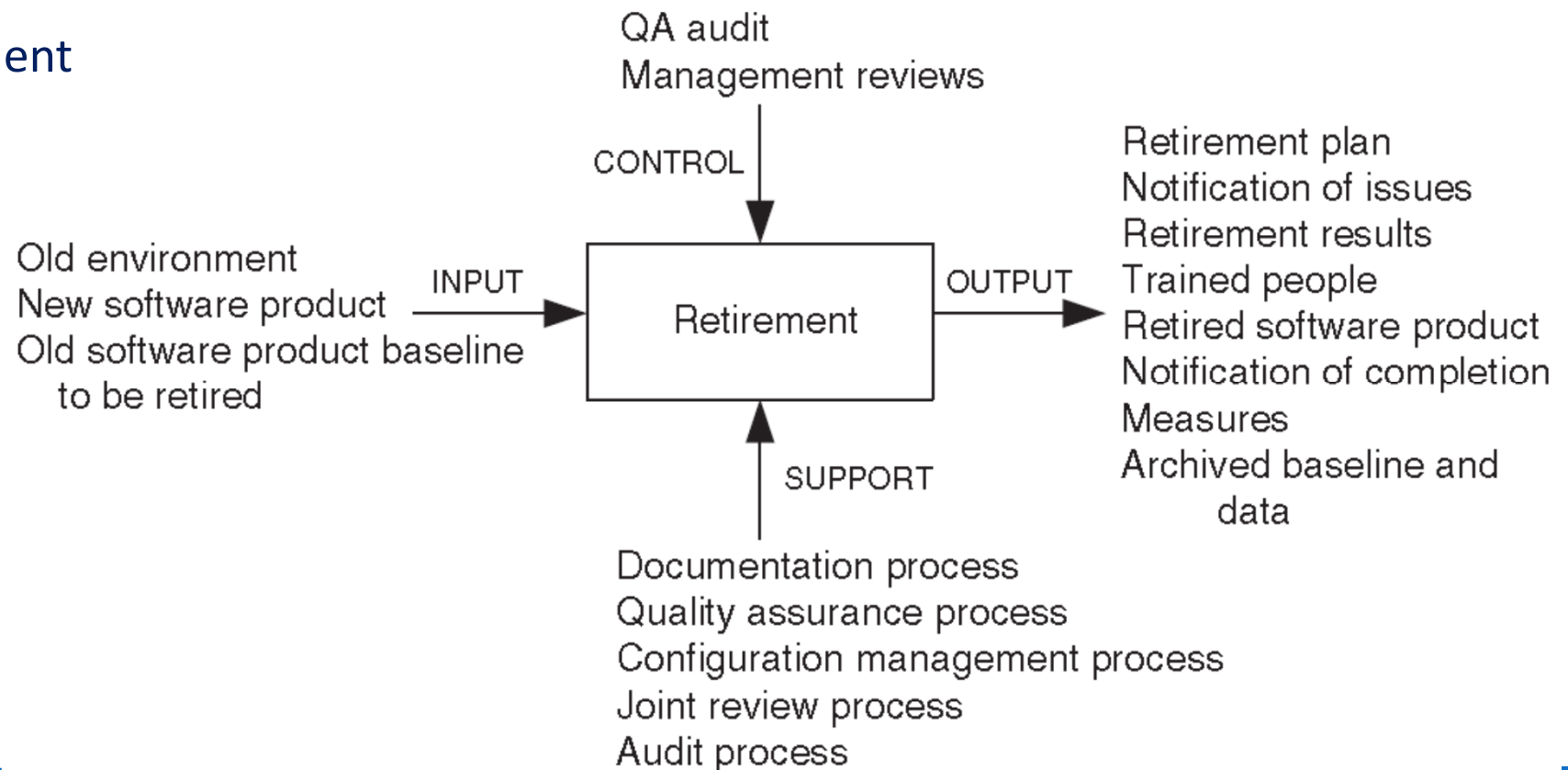
# ISO/IEC 14764 Maintenance Process

## 5. Migration



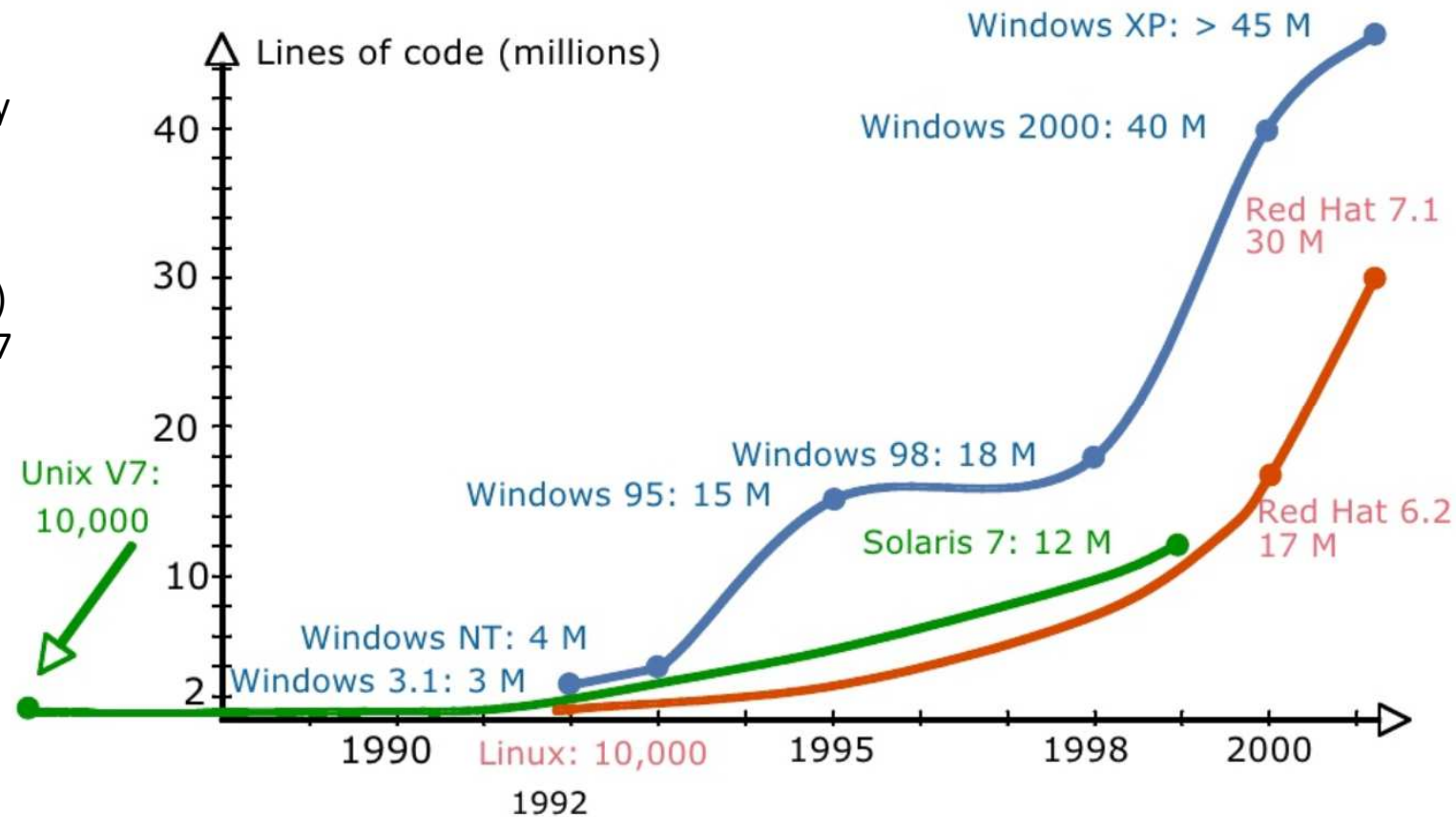
# ISO/IEC 14764 Maintenance Process

## 6. Retirement



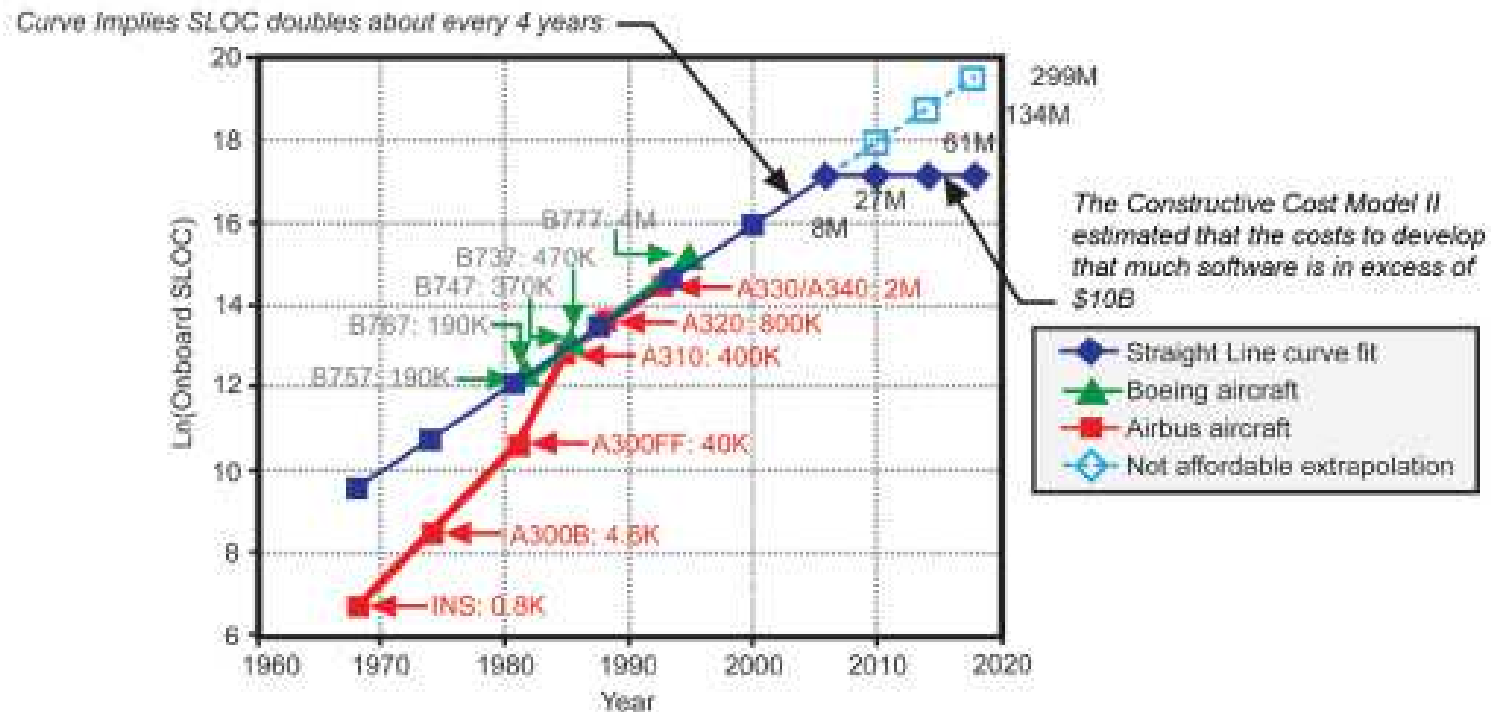
# Examples of Evolution in software Systems

- Empirically there exists 1 error every 20 lines of code , 1 error every 100 lines of code for critical systems
- around 5 errors /FP (function point)  
Where 1 FP ~ 128 line of code in C , 107 lines of code in COBOL



# Software size doubling every four years

## Estimated Onboard Software Lines of Code (SLOC) growth



Airbus data source: J.P. Polacki De Montalk, "Computer Software in Civil Aircraft," Sixth Annual Conference on Software Assurance (Compass '91), Gaithersburg, MD, June 24-27, 1991

Boeing data source: J.J. Chilenski, 2009

