

CSI Software Integration & Improvement

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IN Software Process Integration (SPI)

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INTRODUCTION



- Software Process Improvement (SPI) is a systematic approach to improve the capabilities and performance of software organizations.
- One of the basic things is to assess the organizations' current practice and improve their software process on the basis of the competencies and experiences of the practitioners working in the organization.
- A major challenge is to create strategies and mechanisms for managing relevant and updated knowledge about software development and maintenance.
- Knowledge Management is useful in software process improvement efforts to facilitate the creation, modification, and sharing of software processes in any organization.

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- The fundamental belief of software process improvement (SPI) is that improving the process will lead to improvements in the final product which require assess to the organization's current practice.
- SPI efforts depend on the implicit, individual knowledge of practitioners in an organization.
- To change software developers practices, the organization should improve the practitioners' existing knowledge (both theoretical and practical) of its software practices - knowledge about the new processes should be made available on different organizational levels.

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- A major challenge for SPI initiatives is to create strategies and mechanisms for managing knowledge about software development.
- Therefore, knowledge management useful in SPI efforts to facilitate the creation, modification, and sharing of software processes in an organization.
- The author of the book *Managing Software Engineering Knowledge*, Edwards (2003) motivates the need for knowledge management in software engineering by identifying six principal challenges, three categories of solutions, and two overall strategies that can be employed.

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- The three (2) types of solutions are:-
 - Technological
 - People
 - Process
- The two (2) overall strategies are:-
 - Codification

To systematize and store information that represents the knowledge of the company, and make this available for the people in the company.
 - Personalization

To support the flow of information in a company for example by storing information about knowledge sources, like a “yellow pages” of who knows what in a company.

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Definition – Software Engineering

The branch of system engineering concerned with the development of large and complex software intensive systems. It is concerned with the processes, methods, and tools for the development of software intensive systems in an economic and timely manner.

Finkelstein and Kramer (2000)

Activities or phases include managing, estimating, planning, modeling, analyzing, specifying, designing, implementing, testing, and maintaining.

Fenton and Pfleeger (1997)

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Definition – Knowledge Management

“A method that simplifies the process of sharing, distributing, creating, capturing and understanding of a company’s knowledge”.

Davenport (1998)

- Also known as “Organizational learning”
- Knowledge creation is based on the distinction between **explicit** and **tacit** knowledge.

Explicit knowledge is knowledge that is transmittable in formal, systematic languages. It can be articulated in formal languages, including grammatical statements, mathematical expressions, specifications, manuals and so forth. It can be transmitted across individuals formally and easily.

Tacit knowledge is personal and context-specific, and is therefore difficult to formalize and communicate. It is personal knowledge that is embedded in individual experience and involves intangible factors. It is difficult to communicate and share in the organization and must be converted into words or forms of explicit knowledge.

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In software engineering context,

- knowledge to be explicated in the forms of programs to be executed on computers.
- Software developers spend great effort developing programs, specifications, and models, while at the same time participating in close people-to-people interactions as members of software teams.

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“How can Knowledge Management be applied to Software Engineering in order to foster Software Process Improvement?”

Based on studies that was conducted by Finn Olav Bjørnson (2007) as a part of the Software Process Improvement through Knowledge and Experience research project:-

- By taking a KM perspective on software process improvement (SPI), we could identify and increase learning effects, a key factor in getting developers to improve their practices.
- A key challenge is to involve and keep the developers in the communities of practice and make sure they don't drift out of them, once their involvement has ended.

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- There are many possible applications of knowledge management in software engineering, many possible routes to the goal, and no single approach is necessarily the best for all possible contexts.
- Examples of knowledge management application in software engineering that can be used to improve the software process: **Rational Unified Process** and **Process Workshop**.

REFERENCES



- Bjornson, F. O. (2007, September). Knowledge management in Software Process Improvement, 57-60.

