

EXAMPLE EMBEDDING

Using Examples in Software Development

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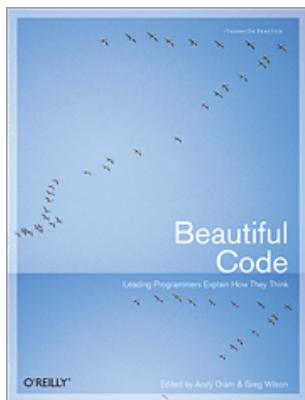
It's the **practices**, stupid



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- "I've taken things I've done that have worked well and **things I've seen done that worked well** and **distilled** them to what I think is their purest, most 'extreme' form"

[Kent Beck, "Extreme Programming Explained: Embrace Change"]

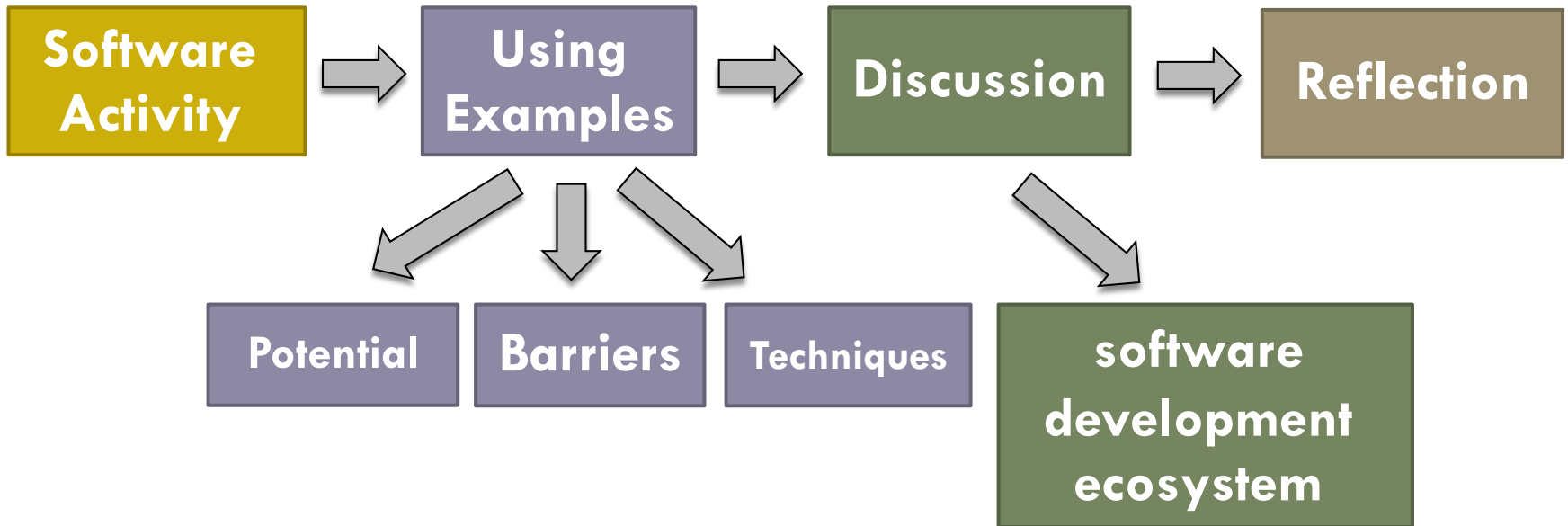


Can we do the same?

Beautiful Code
Leading Programmers Explain How They Think

Agenda

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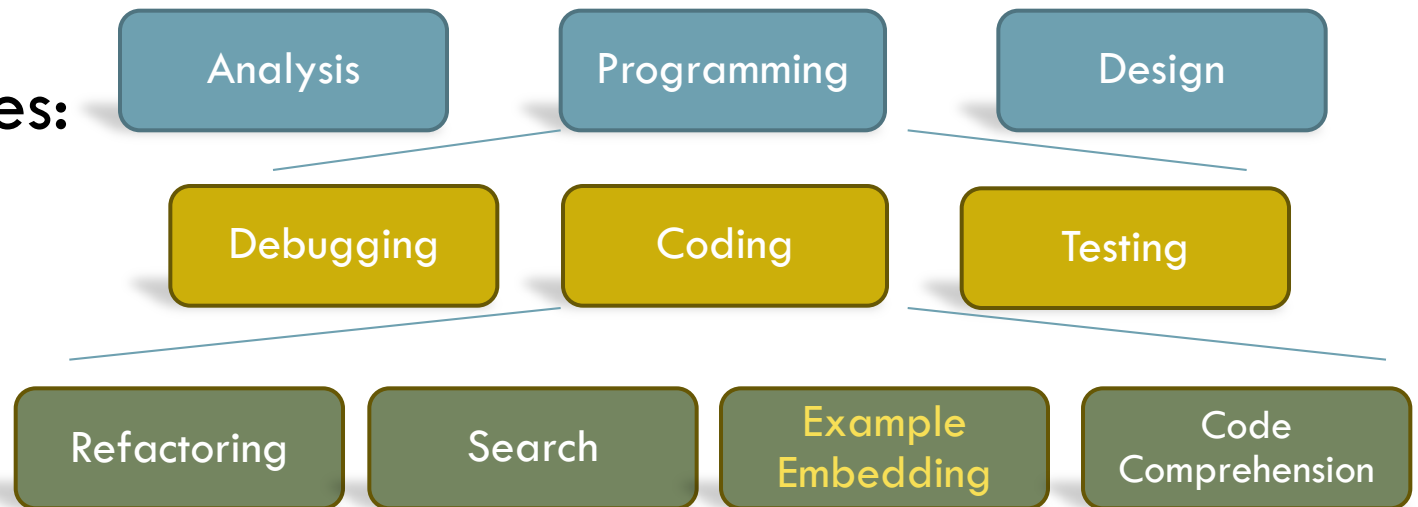


Software Activity

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- **Software Activity** is a collection of fine grained techniques which together assemble an **abstract** key notion in software development
- Software Activity may be composed of finer grained activities

□ Examples:



Refactoring



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much more than an activity

- **Refactoring** is ~~a disciplined~~ **technique** for restructuring an existing body of code, altering its internal structure without changing its external behavior [www.refactoring.com/]
- Although refactoring code has been performed informally for years, William Opdyke's 1993 Ph.D. dissertation is the first known resource to specifically examine refactoring

Appreciating *Refactoring*

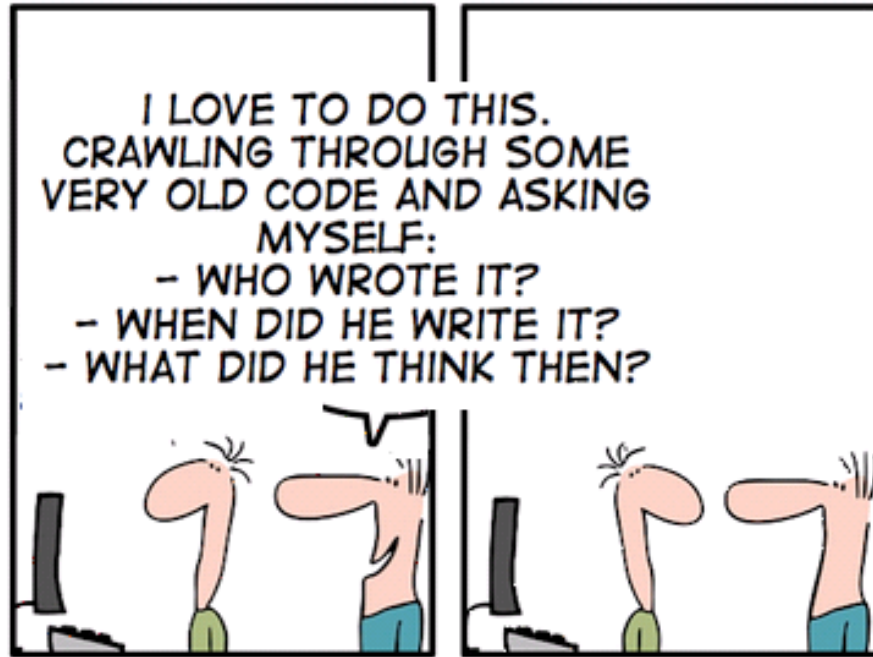
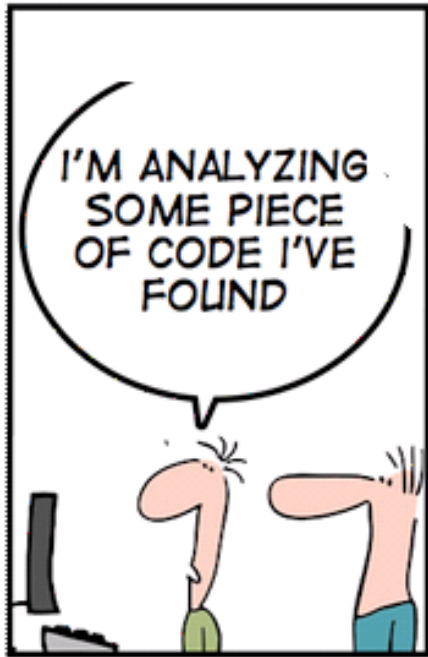
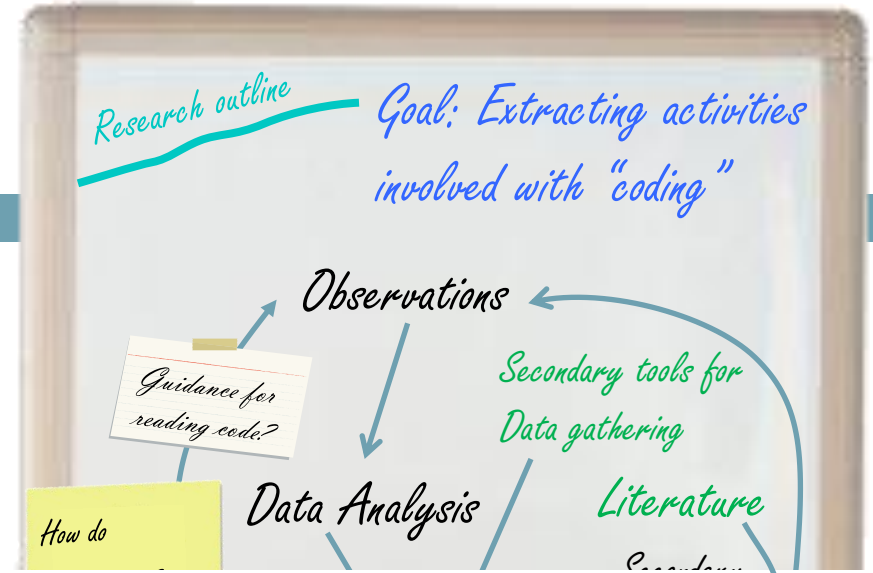


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The mere **identification of refactoring** promoted the following important processes:

- Provided **name** and **definition** for the activity
- Laid the foundations for building a **catalogue**
- Enabled the development of **software tools**
- Promoted new **coding practices**
- Influenced the **development process**

These various aspects serve as an **ecosystem** that exploits the use of refactoring **systematically** and **methodically** to leverage its full potential and eliminate its **pitfalls** and **deficiencies**



What We Do - Summary

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- **OBSERVE** professional developers at work
- **IDENTIFY** things with no “official” name (activities)
- **CHARACTERIZE** those things with respect to the software development **ecosystem**
- **ADVISE** the software organization how to enhance **productivity** by better exploiting the characterized activities

Example Embedding

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- **Example Embedding** is the **notion** of using an already existing code fragment (the example) within a new context
- We argue that **productivity** benefits from using examples **habitually** and **correctly** in **example supportive environment**
- Examples could be used more **systematically** more **extensively** and more **effectively** to exploit their full potential

Benefits of Example Usage



Productivity increase

- ▣ Better code, faster coding
- ▣ Nothing starts from scratch



The code written is more **reusable**

- ▣ More explicit, better documented and tested



Examples promote **learning**

- “* by example”



Unified design is better enforced

We know all that. Don't we?

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We identify:

- Lack of **awareness** to example **existence**
 - ▣ It is not part of the development **routine**
 - ▣ Some developers use examples only on **certain contexts** but not on others (e.g. only on C# but never for cshell)
 - ▣ Some developers use examples only on certain **scale**

- Lack of **awareness** that examples **serves various purposes**
 - ▣ Examples are not only relevant for **learning**, but also for **using**
 - ▣ Capturing the **spirit of the design**



We know all that. Don't we? (2)

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We identify:

- Lack of **dexterity** required for Example Embedding
 - ▣ It requires different skills (which sometimes considered inferior than doing it old-school)
 - ▣ “It would be faster to write it by myself than to search-evaluate-embed a maybe non existing example”
- Lack of browsable/searchable/trustable/relevant **example repositories**
 - ▣ The Internet is sometimes not an option (e.g. copyright)
 - ▣ “Can I trust the guy who wrote it?”



We know all that. Don't we? (3)

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We identify:

- Example **Complexity**

- A single example might be **scattered** all over the code
- The example may have hidden side effects, implicit contract
- Example misuse

- **Cultural and organizational** barriers

- “Not invented here” syndrome
- Copyright issues



Example Embedding Applied

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- Building example set
- Reference application
- Hansel and Gretel
- StackOverflow.com
- Using examples to solve syntax errors
- Embedding examples as 3rd party code

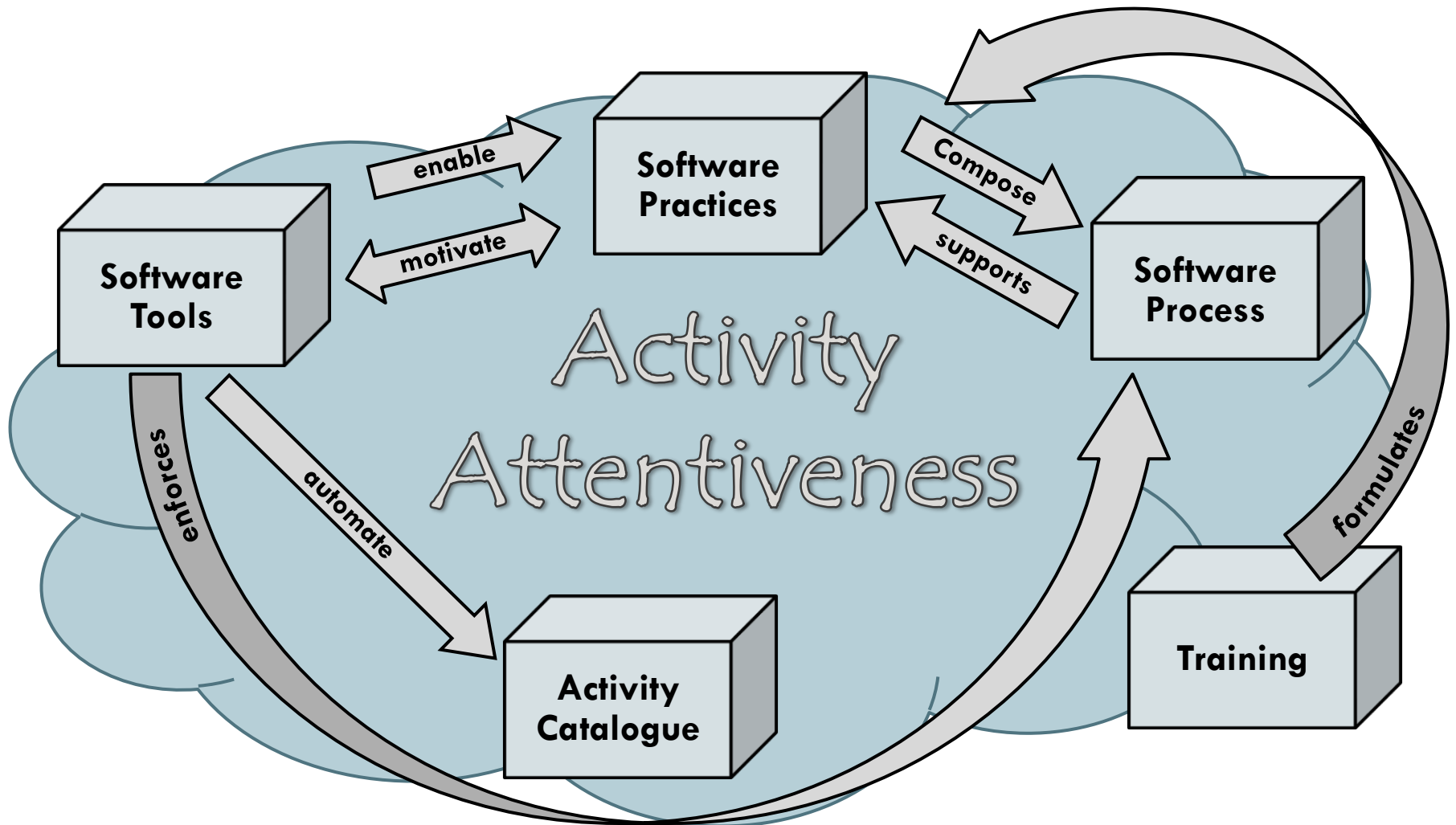
Ecosystem

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The Software Development Ecosystem

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Example Embedding

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- Example Embedding is a **framework** that address all aspects of the software development **ecosystem**:
 - ▣ Attentiveness
 - ▣ Catalogue
 - ▣ Software tools
 - ▣ Coding practices
 - ▣ The development process
 - ▣ Training

- It is **just a framework**
 - ▣ In order to make it useful/applicable a **community** contribution is required

Example Embedding Ecosystem

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- Programming practices
 - ▣ to increase developer attentiveness to example usage
 - ▣ to provide developers with techniques (“best practices”) for finding, assessing and using the examples

- Software tools
 - ▣ to streamline the Example Embedding cycle (find-asses-embed)
 - ▣ to ease repetitive tasks

- Building example catalogues and repositories
 - ▣ to make examples maintainable and easily discoverable
 - ▣ to make example quality assessment task easier

Example Embedding Ecosystem (cont.)

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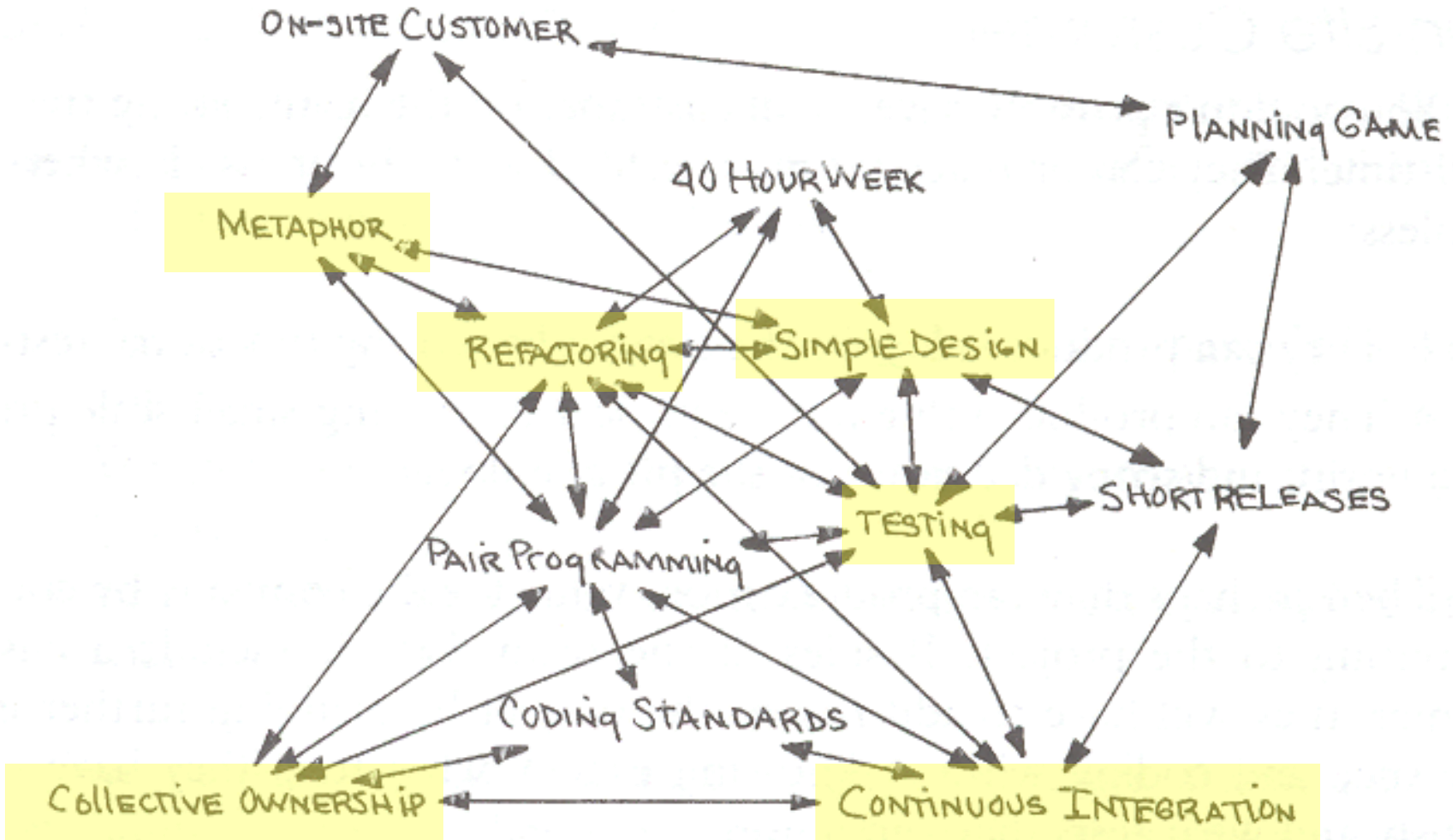
- Development process
 - ▣ to make example **usage** part of the development cycle
 - ▣ to make example **generation** part of the development cycle

- Organizational culture
 - ▣ to **legitimate** example usage
 - ▣ to encourage and promote **example writing**

- Training
 - ▣ to spread the word

Example Embedding and Extreme Programming Practices

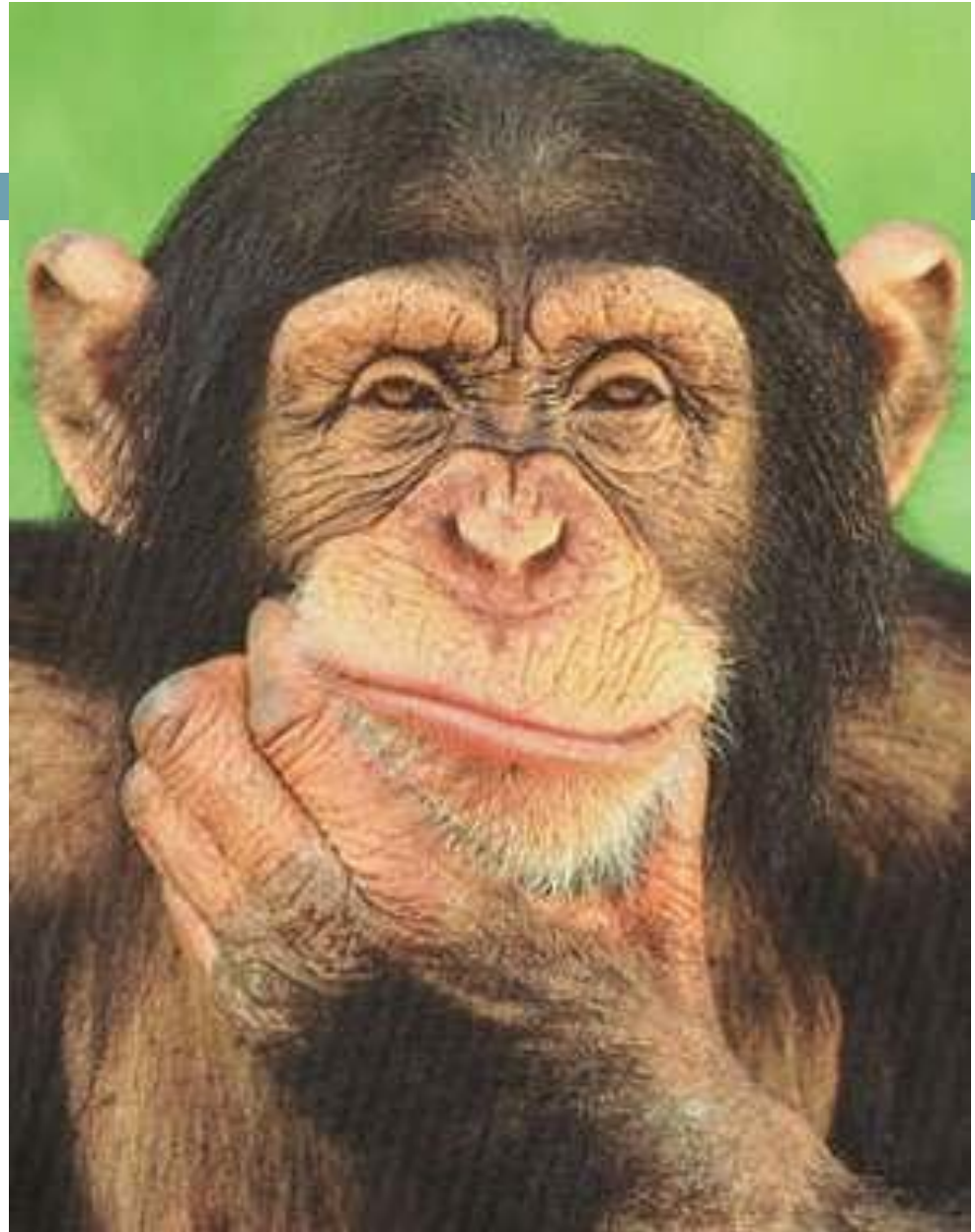
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Reflection

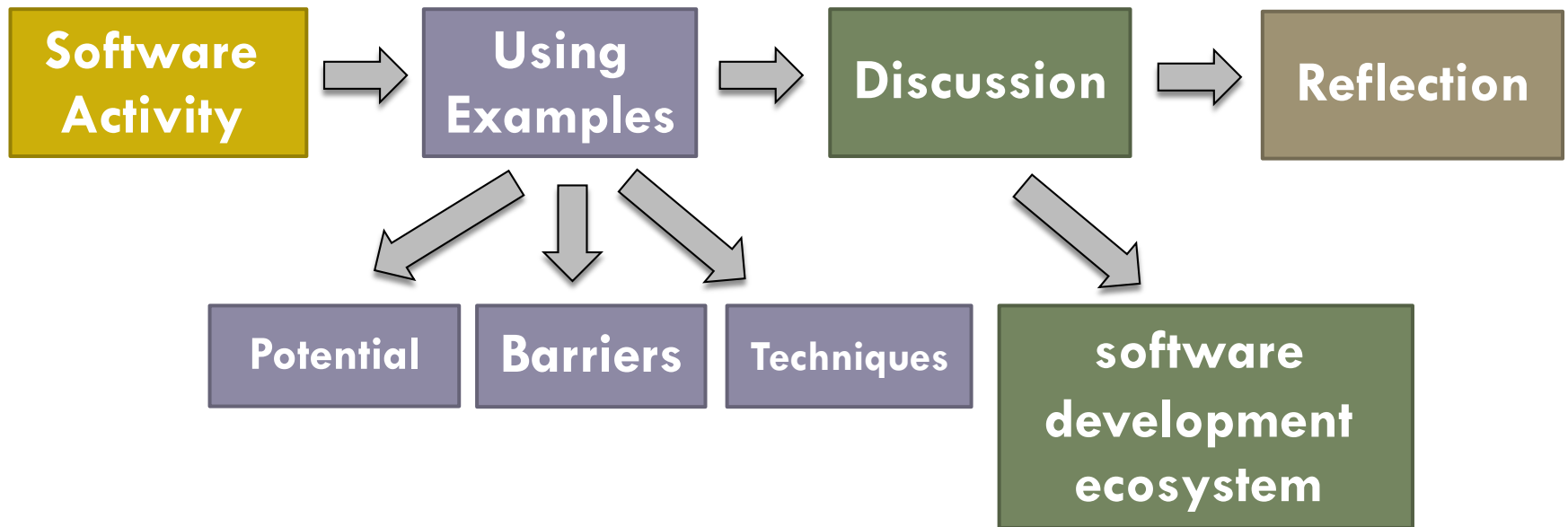
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- Rethink and examine professional creations during and after the accomplishment of the creation process
- Reflective Practitioner [Schön, 1983,1987]



Summary

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Thank you!

Comments?

tinyurl.com/usingExamples

More comments?

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