Software Process Management

Course Code: SE-603

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Credit Hours: 2+1

Engineering versus Programming

Engineers follow procedures, methods, standards to "assure" more predictable results.

No guarantee of quality.

Performance and cost are more predictable.

Measurable.

Verifiable.

Repeatable.

How many ==Programmers==
does it take to change a light bulb?

?

How many Programmers
does it take to change a light bulb?

None.

A defective light bulb is a hardware problem.

How many Software Engineers
does it take to change a light bulb?

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does it take to change a light bulb?

Six.

Analyst to write the specification.

Architect to design a light-bulb changing procedure.

Developer to change the light bulb.

Tester to test it.

Documenter to write RUP project reports.

Auditor to verify that the process was followed.

What is a Software Process?

A process is a method for doing or producing something.

A software process is a method for producing software.

"Producing software" includes

- specification
- design
- construction
- documentation
- transition
- maintenance
- improvement

Managing the project involves

- obtaining resources
- measuring
- tracking
- reviews
- analyzing results and acting on them

Do You Have a Process?

Everyone who develops software uses a process.

Process may not be formal.

You may even be aware of it (not "defined").

It changes every time you develop a new application.

Exercise 1

Identify a process you use *repeatedly* in your daily life.

Why do you follow this process?

Are there any advantages to using a process?

Have you improved your process?

Do We Need a Formal Process?

Teams can be effective without a formal software process!

Teams can have **"jack-of-all-trades"** programmers who understand the business of the organization.

Excellent, motivated developers take initiative and build the software without consensus or planning.

A highly capable development manager may be willing to put in an enormous effort.

Motivated developers put in extra time to get the project done.

Problems with an Implicit Process

What are problems of this approach (implicit process)?

Problems with an Implicit Process

1. Depends a lot on motivated, talented individuals.

    what happens if your best programmer/architect quits?

2. Not repeatable or predictable.

    if you can't predict how long the *next project* will take, then how can you bid (estimate cost)?

3. Stress / burn-out.

    Too much pressure on team.

    Uncertainty and O.T. lead to frustration, burn-out.

    No slack time for HR development.

Another Problem...

1. We learn programming on *small* projects.

2. We develop an implicit process that works well...
   we get "A"s in our courses!

Obviously, we are great "software engineers"!

Problem:
  our implicit process doesn't <u>scale</u> to large problems.

Why a Defined Process?

More Effective
    less time spent on planning, estimates, decisions

Predictable

Repeatable (related to predictability)

Trackable (measuring predictability)

Maintainable

Quality

Capability Improvement
    use what you learn from past experience

Creating a Defined Process

Meta-thinking
    thinking about what you know / do

Humans are the only animal that *consciously* changes his behavior
    "learn from experience"
    improvement - creative thinking & insight

4 key factors in development speed

1. People
- ability, knowledge, skills, motivation

2. Process
- Customer focus
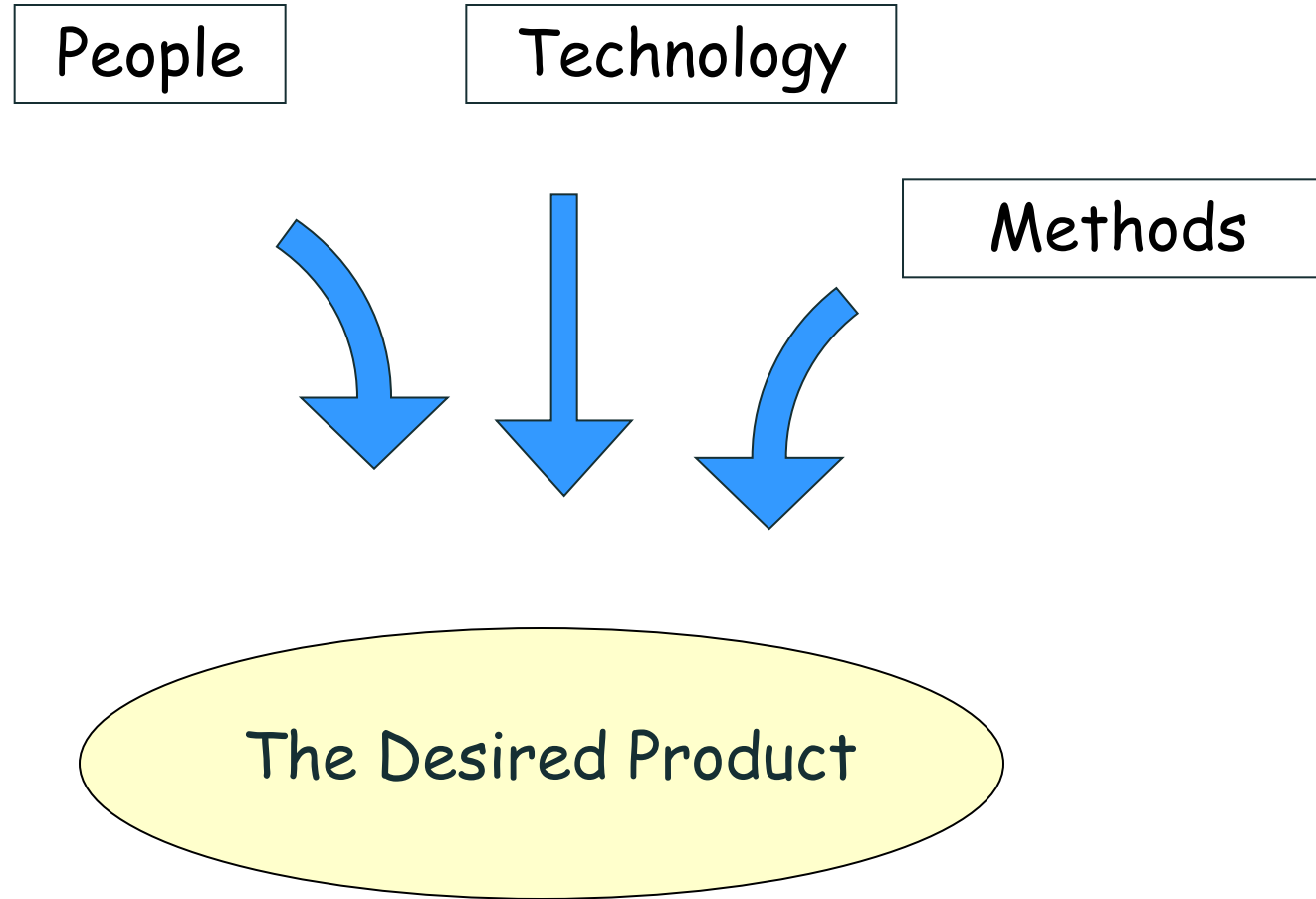- QA, risk management, lifecycle planning, revision control, ...

3. Product
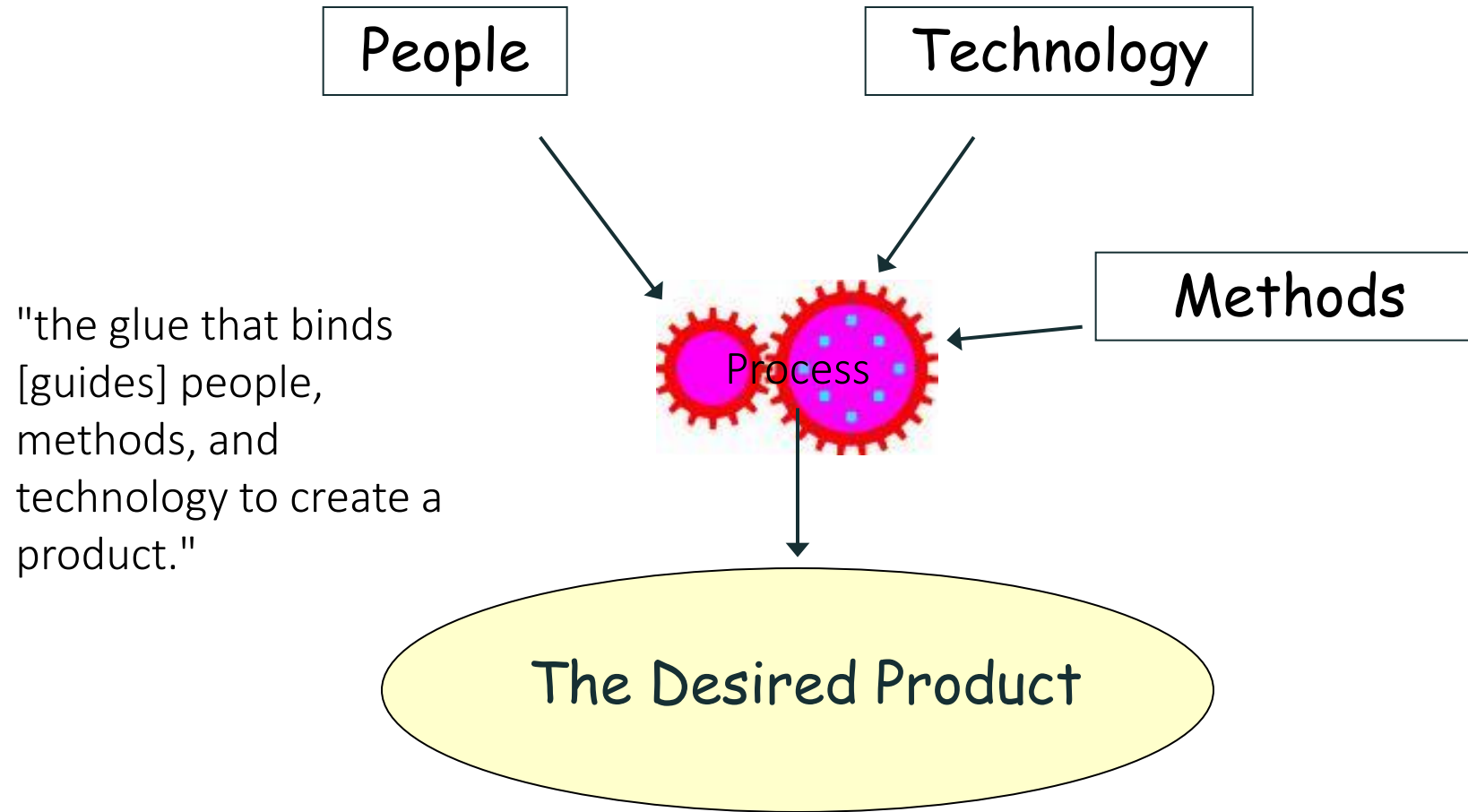- Size and characteristics, phasing

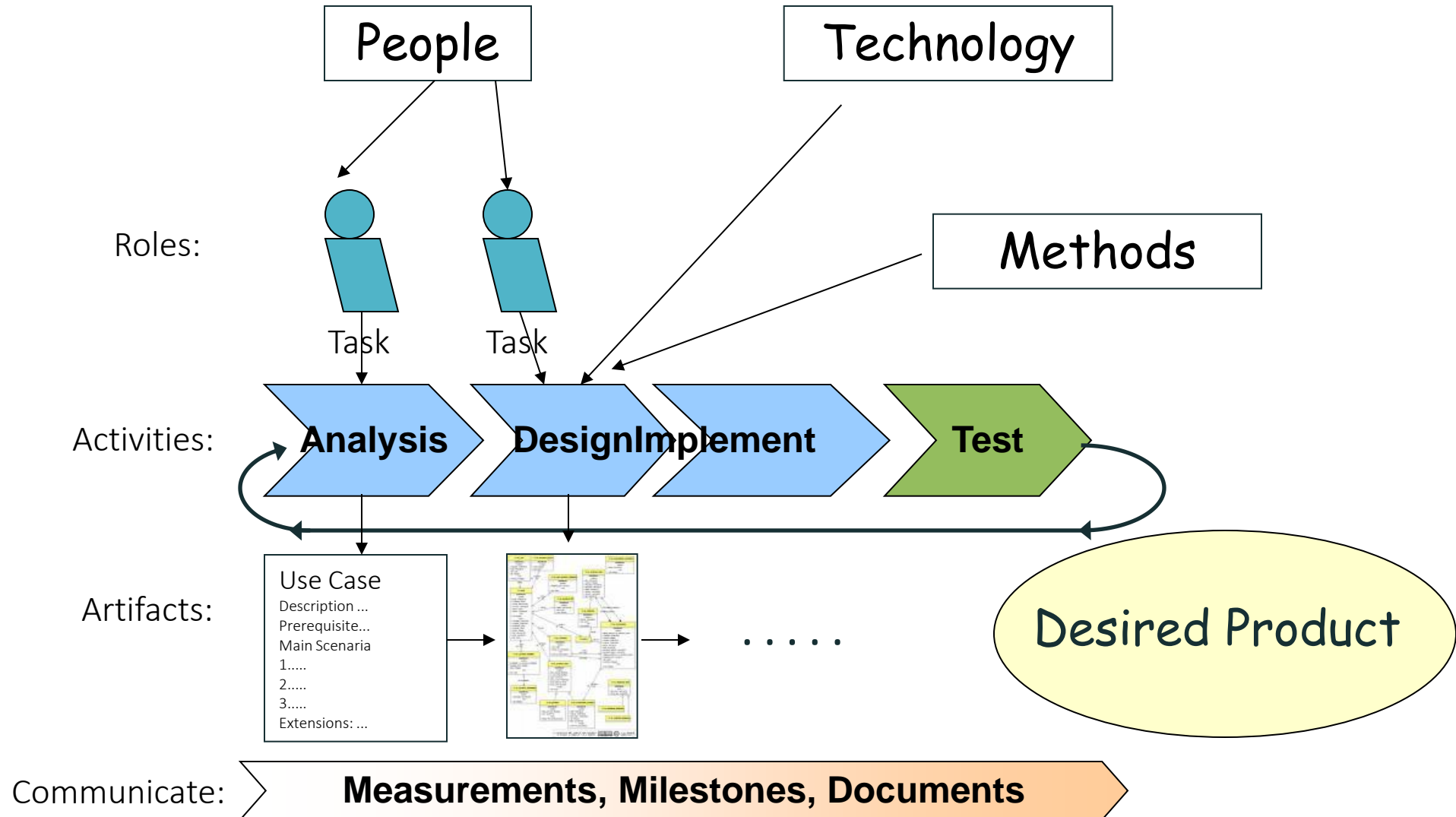**4.** Technology
- Product or software development environment
- Tools

The Role of Process

People

Technology

Methods

The Desired Product

The Role of Process

People

Technology

Methods

Process

"the glue that binds [guides] people, methods, and technology to create a product."

The Desired Product

The Role of Process (2)

What is Project Management

Project management encompasses all the activities needed to plan and execute a project:

- Deciding what needs to be done
- Estimating costs
- Ensuring there are suitable people to undertake the project
- Defining responsibilities
- Scheduling
- Making arrangements for the work
- *continued …*

What is Project Management

Directing

Being a technical leader

Reviewing and approving decisions made by others

Building morale and supporting staff

Monitoring and controlling

Co-ordinating the work with managers of other projects

Reporting

Continually striving to improve the process

What is a Software Process?

The software process is a set of actions required to efficiently **transform a user's need into an effective software solution**.

In simple words, process is how the work is done. **The main reason for defining the software process is to improve the way the work is done**.

By thinking about the process in an orderly way, it is possible to anticipate problems and devise ways to either prevent or resolve these. Many software organisations find difficulty in defining and controlling this process, which is where these have the greatest potential for improvement.