Software Engineering Activities

Activities

"A software engineering activity is a group of related tasks in software development. "

» Activities can be covered by a process.

Each activity/task has input work products and output work products.

- Input work products: the work products that are required in order to complete the activity
- Output work products: the work products that are generated during the activity

Software engineering activity

An example of a software engineering activity: "creating code for all the features"

- Input work products: the features' designs and the requirements.
- Output work products: the source code for the feature.

This activity is initially **done** when you have

- taken all the elements from the designs
- and implemented all the requirements for the features,
- and you have the source code for the features as an output.

Quiz

If the completed essay is the output work product, what do you think would be the best input work products?

- A. Time and money.
- B. Books, articles, and class notes.
- C. A computer and keyboard.
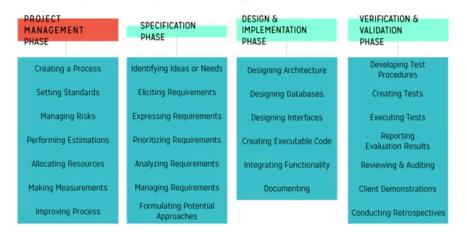- D. a researcher and a writer.

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Software Engineering Activities

SOFTWARE ENGINEERING ACTIVITIES

PROJECT MANAGEMENT PHASE

Creating a Process

Setting Standards

Managing Risks

Performing Estimations

Allocating Resources

Making Measurements

Improving Process

SPECIFICATION PHASE

Identifying Ideas or Needs

Eliciting Requirements

Expressing Requirements

Prioritizing Requirements

Analyzing Requirements

Managing Requirements

Formulating Potential Approaches

DESIGN & IMPLEMENTATION PHASE

Designing Architecture

Designing Databases

Designing Interfaces

Creating Executable Code

Integrating Functionality

Documenting

VERIFICATION & VALIDATION PHASE

Developing Test Procedures

Creating Tests

Executing Tests

Reporting Evaluation Results

Reviewing & Auditing

Client Demonstrations

Conducting Retrospectives

Project management phase

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PHASE

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1. choosing / creating a process

» an important part of managing a project

2. setting standards

» to ensure work is done consistently by the team.
» aspects of development to decide:

- coding conventions
- documentation levels
- testing strategies
- the definition of done

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3. managing potential risks (need to be revisited often)

- Constantly analyzing and mitigating potential risks:
  business / technical / managerial / scheduling / security risk

- Inputs for managing risks
  (any part of the project that could go wrong in some way)
  - historical project records
  - project estimates
  - the software detailed design
  - the life cycle process.

- Output work product for risk management:
  - a risk plan that would outline potential risks
  - and their respective risk mitigation plans

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4. performing estimation of development timelines

» a vital activity for software manager

» are based on estimates of how long it will take to complete tasks.

- Tasks involved in the estimation activity would be
  - collecting data for estimates,
  - calculating estimates,
  - evaluating estimates.
- Input work products
  - a list of tasks that need to be completed.
  - task development rate, i.e., how long it normally takes developers to complete a task.
- Output work product: estimates.

  » will be an input work product for generating schedules.

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5. allocating resources

- planning and scheduling staff resources
- breaking down the work schedule and assigning tasks.

[recall] "Resources are anything that improves, advances, or funds a project."

- time
- money
- equipment
- ...

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6. making measurements

» Activities are:
- defining metric,
- calculating metric data
- and analyzing metric data.

» Metrics are used to track and assess the product and/or the process.

» These metrics can measure:
- the density of defects in the product,
- the rate at which your team is completing tasks,
- the number of features complete,
- ...

Project management activities

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7. improving process

» Improvements made to the process itself

- The product manager need to test and review the process.
- The development team need to test and review the product.

» Apply some of the results from your metric data in this activity,

» so that at the next calculation your process will score better.

Context

- Kevin is a software product manager for a development team that is working on an ordering app for local takeout restaurants.
- He has been at home with the flu for the last week.
- When he returns he wants to know which of the project management activities have been completed while he was away.
- He looks around the office and sees a schedule of tasks to be completed and a risk plan dated with yesterday's date.
- He then logs onto his computer and sees that new task development rates have been entered, and that the Progress Tracking Chart is up-to-date.

Which of the following activities does Kevin have to complete?

- A. allocating resources,
- B. managing risk,
- C. performing estimates,
- D. making measurements

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An activity is complete when

- all input work products are consumed
- and output work products are produced.

- Iteration schedules, risk plans, and progress tracking charts are all output work products for project management activities.
- Task time estimates are an input work product for performing estimates.
- Since Kevin only had updated task development rates and not estimates, that activity has not yet used all it's inputs and produced all it's outputs.