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Computing Project

Topic 1:

Introduction

V1.0

Scope and Coverage

This topic will cover:

- Appropriate artefacts
- Planning your project
- Appropriate development methods
- Appropriate risk management
- Appropriate configuration management

Learning Outcomes

By the end of this topic, students will be able to:

- Project manage the analysis, design, development and deployment of a computing artefact.

Key Points

- The content of this lecture is not meant to replicate or replace concepts and techniques introduced in other modules associated with this programme.
- It is meant to complement concepts and techniques introduced in other modules associated with this programme.
- This lecture should help YOU decide how YOU want to carry out YOUR project and justify YOUR decision.

Appropriate Artefacts

What is an Artefact?

- Something that you produce during the course of your project. This could include:
  - Models
    - Use Case diagrams
    - Class diagrams
    - Sequence diagrams
  - Code (the programmes that you write)
  - The Working System
  - Supporting Documentation (test scripts, Gantt charts, user guides, etc.)

Artefacts for Your Project - 1

- ***Models***
  - YOU must justify why you have chosen a particular type of model for YOUR project.
- ***Code***
  - What language are YOU going to use to code YOUR project (Java, PHP, MySQL, etc.)?
  - YOU must justify why you have chosen a particular language to code YOUR project.

Artefacts for Your Project - 2

- ***The Working System***
  - Is YOUR project going to develop a website, a database system, or something else?
  - YOU must justify why YOU are going to develop a particular type of system for YOUR project.
- ***Supporting Documentation***
  - What documentation will support YOUR project?
  - Future lectures will help with the definition of this particular set of artefacts.

Planning Your Project

Defining YOUR project

- Aims
- Objectives

Aims - 1

- The aims of YOUR project are associated with things that YOU are going to:
  - Design
  - Develop
  - Evaluate
  - Investigate

Aims - 2

- Typical aims for a student project are:
  - To develop a database system to achieve something
  - To develop a web-based system to achieve something
  - To investigate the use of a particular tool or technique in a particular project environment

Objectives - 1

- Objectives are things that you need complete in order to achieve the aim(s) of YOUR project.
- If the aim of YOUR project is to develop a database system for a telephone company – your objectives might be:
    - Complete a literature search about existing database systems for telephone companies.
    - Gather user requirements.

Objectives - 2

- Develop a model of the database system for YOUR project.
- Code the model to produce a working system.
- Test the working system.
- Deploy the working system.
- Write YOUR report.

SMART Objectives - 1

YOUR objectives should be SMART:

- ***Specific***
  - Provide enough detail to understand what should be done.
- ***Measurable***
  - Provide enough detail to measure progress of the objective and know when it is complete.

SMART Objectives - 2

- ***Appropriate***
  - With respect to the aim(s) of the project
- ***Realistic***
  - Achievable within the duration of the project
- ***Time-related***
  - Provide a statement of how long the objective will take and by when should it be completed.

Planning YOUR Project - 1

- ***Work Breakdown***
  - Produce a model that shows the tasks that must be done in order to complete the project.
- ***Time Estimates***
  - Produce estimates of the time required to complete the tasks.
- ***Milestones***
  - Significant points in your project that can be used to give an indication of how well the project is going

Planning YOUR Project - 2

- ***Activities***
  - Identify the order in which tasks must be completed.
- ***Present YOUR Plan***
  - Use the tasks, time estimates, milestones and activities to produce a plan, normally in the form of a Gantt chart.
- ***Re-plan (if required)***
  - Sometimes things go wrong – you may need to re-plan YOUR project.

Appropriate Development Methods

Different Methods

- You have been introduced to several different software development methods throughout this course:
  - ***Agile***
  - ***Object-oriented***
- Both of the above methods are appropriate for student projects; however, they both have their strengths and weaknesses for various types of projects.

Agile

- An all round method that can be used for most student projects:
  - Can be used with object-oriented techniques
  - Good for database development and website development
  - Clearly defined project management approach
  - Not good for developing real-time systems

Object-Oriented

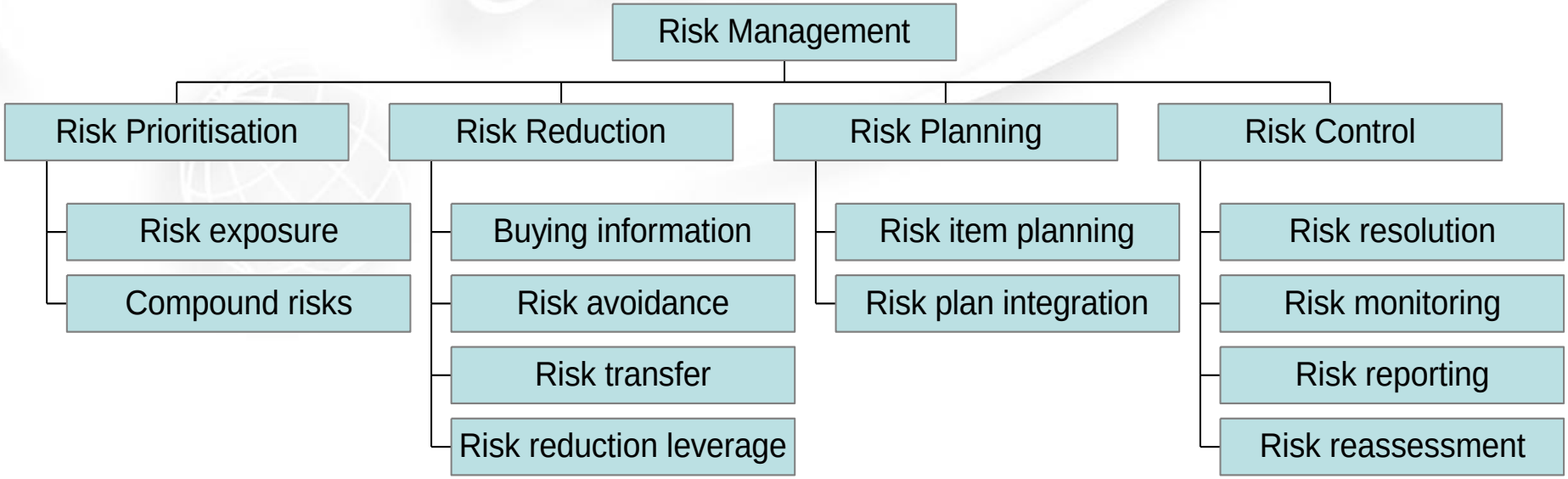
- A method that can be used for most student projects:
  - UML notation can be used to model database systems.
  - Good for database development, website development and the development of real-time systems

The Method for YOUR Project

- YOU are responsible for choosing the method:
  - Choose the project
  - Choose the method
  - Choose the language
- Make sure the method fits the project and the language fits the method.

Appropriate Risk Management

What is Risk Management?



Relax!

You are not required to follow everything on the previous slide for your student project!

Risk Management for Student Projects

- *REMINDER – You are not required to use this approach. It is presented to give you an idea of the level of detail with which you need to approach risk in your project!*
- Risk Management Approach
  - Identify Key Stakeholders
  - Identify Critical Success Factors
  - Isolate the Baseline Plan
  - Analyse and Assign Risks

Identify Key Stakeholders

- Many people want many things from a software development project.

- Identify the ***key stakeholders***: the people whose wants count.

Identify Critical Success Factors

- Ask the key stakeholders what they require for success.
- The answers are the ***critical success factors*** of the project and are used to measure the success of the project.
- A ***risk*** is something that could prevent one or more of the critical success factors being met.

Isolate the Baseline Plan

- Risks must be associated with a plan before they can be handled.

- As risks could prevent the achievement of objectives, plans for achieving the objectives must be in place before risks can be considered.

Analyse and Assign Risks

- ***Identify***
  - What are the potential risks?
- ***Assess***
  - What is the likelihood of the risk occurring?
  - What is the impact of the risk?
  - What containment and/or contingency is appropriate?
- ***Allocate***
  - To whom can I assign the risk? (very likely to be you)

Containment vs. Contingency

- ***Containment***
  - Action taken before the risk occurs
  - Might prevent the risk from occurring
  - Should reduce the impact if the risk occurs

- ***Contingency***
  - Plan of action made before the risk occurs
  - Alternative plan triggered by the risk occurring

Major Sources of Risk

- Contractual/Environmental
- Management/Process
- Personnel
- Technical

Contractual/Environmental

- There are many factors that cause this type of risk. The one most relevant to a student project is:

  - An unreasonable customer

Management/Process

- There are many factors that cause this type of risk. Those most relevant to a student project are:
  - Inadequate control of development products
  - Problems and errors detected late
  - Inadequate technical approaches

Personnel

- This type of risk is to do with people:
  - Wrong grade
  - Wrong training
  - Wrong expertise
  - Too many people
  - Too few people
- The above risks are not likely to occur on your project as YOU are the only team member and you have been educated on this NCC Education programme.

Technical

- ***Requirement Changes***
  - Genuine changes of mind by the customer
  - Hidden implications within requirements
- ***Failure to Meet Requirement***
  - Cannot produce a feasible design
  - Acceptance test fails
- ***Problem or Error Detected***
  - Inconsistent design
  - Missing component
  - Inadequate time for testing

How Display Risks

Risk	Impact	Likelihood	Severity	Tracker	Action/Contingency
Insufficient disk space.	3	3	9	Vic	(A) Investigate cost & lead time for upgrade.
Insufficient memory.	2	2	4	Ian	(No action at present)
Version 2.0 of the database is a bit buggy.	9	3	27	Kami	(A) Send Kami on early training course. (C) Use version 1.0.
Requirements not too detailed.	8	5	40	Vic	(A) Check on progress and choose best areas for phased delivery.
Users not available for CAT.	6	6	36	Ian	(A) Check user plans (C) Use external testers.

Appropriate Configuration Management

What is Configuration Management? - 1

- Common problems in software development projects are in the co-ordination and control associated with project artefacts.
- Configuration management, for large projects, is facilitated by the use of expensive software to enable the following:
  - The building of different systems to meet the requirements of different users

What is Configuration Management? - 2

- The preservation of old versions of the system, e.g. to investigate a fault
- The building of a version of the system that contains certain fixes but not others
- To allow two or more developers to work on the same artefact at the same time
- To store artefacts efficiently

The Good News

- YOU are not required to use a complex and expensive configuration management system for your student project.

- A simple directory structure will be appropriate.

Simple Directory Structure

- A simple directory structure along with supportive documentation is included in Exercise 1 in your Student Guide.
- The purpose of Exercise 1 is to:
  - Show you the type of directory structure that is appropriate for a student project
  - Show you the level of supportive narrative required in a student project
  - Give you an opportunity to develop your own directory structure and supportive narrative

WARNING *– do not copy the directory structure and supportive narrative into your project; however, you can tailor it to support the needs of your project.*

Computing Project – Introduction

Any Questions?

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