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Exam I – CS360 – Fall, 2011

1. Describe:

A) Application Architecture

The specification of the components of the project as

well as the points at which they intersect

B) Information Architecture

I’m still pretty iffy on this one...

C) Systems Architecture

The specification of how the components of the project

behave or work together.

D) UML Architecture

As opposed to the above architectures, which are high

level, the UML architecture should be at a lower level,

specifying not only what the components of the project

do, but how they do it (with members, methods, etc.)

2. Describe the requirements engineering and elicitation

process in more detail from initial gathering of VOC to CN

to FR in axiomatic design, including risk concepts.

A) Design matrix results in which UML diagram type?

Component diagram

B) DSM results in which UML diagram type?

Class diagram

C) What is the V-Model?

A visual representation of the axiomatic design process

(the steps of which are modeled as moving down towards

module definition and up towards the finished software

product)

D) QFD?

“The voice of the customer translated into the voice of

the engineer.” “The ultimate goal of QFD is to

translate quality criteria into objective ones which can

be used to design and manufacture the product.”

E) FMEA?

A procedure of defining potential failure states of the

project and their likelihood and causes.

3. When using Axiomatic Design process to develop classes, how

do the following map to OO Design object elements?

A) FR

Classes

B) DP

Data structures

C) FR/DP design matrix intersection

Methods

4. Describe the Purpose of these tools/software used in your

project:

A) Acclaro DFSS

This software is used to allow the creation of design

documents along the lines of the axiomatic design

process, as well as the QFD, FMEA, etc. not related to

axiomatic.

B) Microsoft Visio

Visio allows the creation of diagrams, such as our UML

diagrams and other design documents (that’s all I used

it for)

C) Basecamp

This is an online collaboration system allowing for

calendar based scheduling, document uploading, and group

management. Our group used this extensively.

D) Microsoft Project

This tool was used for our Gantt Chart; I’m assuming it

has additional uses, but that was what we used it for.

E) Microsoft PowerPoint

This is a slide based presentation design and presenting

tool.

5. Describe the standards applied in this project:

A) IEEE-830 (SRS)

SRS is a description of how the system to be engineered

with act and also includes non-functional requirements

of the system.

B) IEEE-1058 (PMP)

Includes an overview of the project, the organizational

structure of the project, process plans, etc.

C) IEEE-1016 (SDD)

SDD is used to record the application

architecture/design in a standardized way.

6. In OO design, describe the concept (with symbol):

A) Aggregation

A composition relationship without implication of

ownership; unfilled diamond

B) Composition

A “has a” relationship between objects or entities;

filled diamond

C) Polymorphism

The ability of objects of a subclass to fulfill

requirements of its superclass; no UML symbol

D) Inheritance

A subclass derives some of its functionality from a

superclass that more generally defines its type; open

arrowhead toward superclass

E) Blackbox

A black box is a component about which only its external

interfaces are known (i.e. nothing about its inner

workings); uses the component symbol with a listing of

provided and required interfaces

7. In OO design, describe the concept (with symbol):

A) Public operations

Public methods and members can be referenced from

outside the class; denoted with a plus sign

B) Private operations

Private methods and members can be referenced only from

inside the class; denoted with a minus sign.

C) Inclusions

?

D) Extensions

?

8. Describe how the following concepts are used in your

project:

A) Architecture Decomposition View (ADV)

?

B) Work Breakdown Structure (WBS)

?

9. In OO design, describe the concept (with symbol):

A) Association

An object relationship characterized by one object being

able to cause another to perform an action; single line

with optional arrowhead

B) Generalization

A class relationship characterized by one class being a

more specific form of another class; line with unfilled

triangle

C) Dependency

A relationship in which one class at some point will

require the use of another (in some fashion); dotted

line with arrowhead

D) Realization

A relationship in which one component recognizes the

actions of another component; dashed line with unfilled

arrowhead

E) Annotation

?

F) Interface

A situation in which subclasses (or in Java, classes

that implement the interface) are required to provide

predetermined requirements and require certain

predetermined inputs; interfaces are denoted with double

angle brackets around their name

10. Define each performance attribute:

A) Efficiency

The measure of performance (i.e. work vs. time)

B) Flexibility

How well the system adapts to different situations

C) Integrity

How well the system holds up to increased loads

D) Security

How well the system repels intrusion or “hacks”

F) Portability

How difficult the task of migrating the system to a new

platform is

G) Reliability

The trust in the system to run relatively unmonitored

H) Usability

How difficult the interaction with the system is

11. Describe how you have used your concept map and basecamp

tool to organize your work as a team using RUP as a guide:

I really haven’t used my Cmap to much effect—it’s tedious

to update via the MyIPFW file upload mechanism; a sentiment

echoed by the rest of my group. So mainly we have been

using basecamp because of its ease of file uploads and

integrated messaging system. Once we’re satisfied with a

version of a file (after each of us working on bits and

pieces and uploading it to basecamp), then we upload it to

the Cmap, which is demarcated into RUP phases to keep

everything organized. In the last week or so, we’ve been

trying to move to a new group Cmap that I designed and put

on the public Cmap servers (this allows for live editing

and \*very\* easy file uploads), so our organization is kind

of in flux at the moment.

12. Which three SWEBOK areas apply to your role in the project

and why?

A) Software requirements: as business analyst, I worked

with the sponsor’s feature requests translating those

into eventually into functional requirements.

B) Software design: my in-group title is “Designer” and I

have contributed to non-paperwork oriented design

aspects of the project. Software design seems to fit...

C) Software Construction: all of the members of my group

come from a programming oriented background in computer

science and all are “developers”. Although our group

hasn’t come to the RUP construction phase yet, this will

eventually apply.

13. Other than class and component diagrams that all teams are

required to use, select 3 UML behavior diagram types that

your project could use and why?

1) Profile diagram; one of the requirements of our project

is to profile student preferences.

2) Deployment diagram; our project will be deployed not

only to servers at IPFW, but those servers will then

deploy client applications to users, which could be

modeled.

3) Communication diagram; our project utilizes a client

server architecture and access to several database

systems over the course of its run.

14. On UML:

A) What is the relationship between UML and SysML?

SysML is a recent set of extensions to traditional UML.

UML is normally used for software based projects, but

SysML is designed to extend to engineering for the

purpose of modeling relationships between hardware and

software components of a project.

B) What is executable UML?

Executable UML is when portions of a UML diagram model

done and redone routines such that the routines are

themselves routine and the actions of each such routine

have been databased such that the diagram itself, being

made up of such routines can actually be executed as

though it were a program.

15. Describe how this course has helped you manage your team:

A) Management

Earlier in the course, different management styles were

discussed; as I was not the project manager, I didn’t

actually implement any of these, but it definitely

highlighted the differences between hands-off and hands

on management styles.

B) Architecture

This class gave our group an opportunity to more

formally learn about UML. We had all encountered it in

previous classes, but were not aware of it in fine

detail. This class also showcased other different forms

of design architectures at a higher level view which I

was not personally aware of.

C) Detail Design

I’m not familiar with this term...

D) Documentation

Our team would not have produced nearly any of the

documentation that was required during the inception

phase otherwise; more than likely our documentation

would have been more informal, so this class definitely

impacted our group in this aspect in a positive way.

[BONUS] List up to 10 aspects of this course you enjoyed/learned

from the most?

I’d have to say that “enjoyed” is a word inapplicable to

this class. I’d also have to say that in the same way

“learned” is at best subjective.