IS352: Advanced Systems Development

Exercise 4 Answer

(A) There are 2 main kinds of Whole-Part structures, one is known as "strongly-owned" (also known as composition - these are when you would use a solid diamond in the diagram) and the other as non-strongly owned (also known as aggregation – this is when you would use the hollow diamond in the diagram).

In a small furniture manufacturing business, a chair is regarded as an object made up of legs, seat and back. When a chair is sold, it, together with its parts, is deleted from the system. When a chair is taken apart it is also deleted from the system, though its parts may be reused, so they are not deleted. Decide whether the relationship between "chair" and its parts should be modelled as strongly owned or not, giving reasons for your choice.

The relationship between "chair" and its parts should be modelled as strongly owned.

The cascading delete problem is actually a red herring in this example. However there is no way you could have a chair without a seat, legs and back, hence it is strongly owned.

3 marks for the correct answer and 6 marks for the reason (Total 9 marks)

(B) In their paper **Beyond Methodologies: Keeping up with Information Systems Development Approaches through Dynamic Classification**, presented to the 32nd Hawaii International Conference on System Sciences in 1999, Juhani Iivari, Rudy Hirschheim and Heinz K. Klein argued that particular methodologies could be classified into about 11 different approaches to IS development by use of four major characteristics, namely:-

- The goal of the approach,
- Its guiding principles and beliefs,
- Its fundamental concepts and
- The principles of the ISD process as used in that approach.

The table below is adapted from their paper and is intended to show the defining characteristics of three of those fundamental 11 approaches.
Unfortunately not all of the entries have been made into the table, though most of those that have not yet been entered are written.

You are asked to complete the table by assigning the written statements A to H to the correct boxes in the table.

	Structured Approach	Object-Oriented Approach	SSM Approach
Goal	To provide an approach which helps to produce high quality (reliable and maintainable) software in a productive way	To provide an approach which helps to ensure that the products are delivered to the user on time and within budget, that the products meet user requirements, that user requests to modify the system and/of fix bugs are responded to in a timely fashion, that increasingly sophisticated products are offered so as to keep a competitive edge, that the changes in standards and delivery technology are kept up and the project team feels motivated and successful	To provide a learning methodology to support debate on desirable and feasible changes
Guiding Principles and Beliefs	Separation of the essential model from the implementation model; Careful documentation to make the development process visible; Graphical notations; Top-down partitionable transformation / process models to hide complexity; Unambiguous, minimally redundant graphic specification; Balancing of models; Design modules with high cohesion and weak coupling	Seamless analysis, design and implementation; Encapsulation; Information (implementation) hiding	User of notional system modules called 'human activity systems' to illuminate different Weltanschauungen which may be applied to any social system; An information system is a system to supportthe truly relevant human activity system

Fundamental Concepts	Essential model vs. implementation model; Transformation; Data flow; Data store; Terminator; Module; Cohesion; Coupling	Problem domain vs. implementation domain; Object and class; Encapsulation; Information hiding; Inheritance; Polymorphism; Communication between objects	Weltanschauung; Human Activity Systems; Root definition; Relevant system
Principles of the ISD Process	A step by step process at the detailed level of analysis and design activities; Situation dependent at the 'strategic level' (waterfall or concurrent prototyping)	Iterative and incremental development; Reuse	Stream of cultural analysis; Stream of logic-based analysis

A - To provide an approach which helps to ensure that the products are delivered to the user on time and within budget, that the products meet user requirements, that user requests to modify the system and/of fix bugs are responded to in a timely fashion, that increasingly sophisticated products are offered so as to keep a competitive edge, that the changes in standards and delivery technology are kept up and the project team feels motivated and successful

B - Iterative and incremental development; Reuse

C - Weltanschauung; Human Activity Systems; Root definition; Relevant system

D - Separation of the essential model from the implementation model; Careful documentation to make the development process visible; Graphical notations; Top-down partitionable transformation / process models to hide complexity; Unambiguous, minimally redundant graphic specification; Balancing of models; Design modules with high cohesion and weak coupling

E - To provide a learning methodology to support debate on desirable and feasible changes

F - User of notional system modules called 'human activity systems' to illuminate different Weltanschauungen which may be applied to any social system; An information system is a system to support the truly relevant human activity system

G - Problem domain vs. implementation domain; Object and class; Encapsulation; Information hiding; Inheritance; Polymorphism; Communication between objects

H - Essential model vs. implementation model; Transformation; Data flow; Data store; Terminator; Module; Cohesion; Coupling

3 marks for each correct assignment – Total 24 marks