MODEL ANSWER FOR S/W ENGINEERING & DESIGN (PAPER 10, QUESTION 12)

2004

PLAN FOR MANAGING DEVELOPMENT RISK

a) WOULD DEFINE PROJECT PHASES, POSSIBLY USING AN INCREMENTAL DEVELOPMENT MODEL SUCH AS THE SPIRAL MODEL, AND SPECIFY RISK REVIEWS TO TAKE PLACE IN EACH PHASE.

b) SOURCE DOCUMENTS AND REFERENCE TO OTHER (ISO 9000) DOCUMENTATION
DEFINITION OF DEVELOPMENT PHASES
RISK REVIEW TO TAKE PLACE IN EACH PHASE, INCLUDING ACTIONS WHEN PROBLEMS FOUND

c) PROJECT MANAGERS, ESPECIALLY MORE SENIOR ONES WHO DON'T HAVE DAY-TO-DAY INVOLVEMENT, AND CLIENTS

d) POSSIBLY A CLIENT, MOST LIKELY THE PERSON WHO MUST TAKE FINANCIAL RESPONSIBILITY FOR PROJECT OVERRUNS OR TECHNICAL COMPROMISE

e) IN LAS, RISKS SHOULD HAVE BEEN CLEAR AT OUTSET, WITH REVIEWING ASPECTS OF SOME EARLIER CONSULTANTS' REPORTS THAT WERE "FORGOTTEN". IN CAPSA, A DEFINED PHASE TRANSITION AND RISK REVIEW WOULD PROBABLY HAVE RESULTED IN POSTPONEMENT OF SYSTEM GOING LIVE

SAFETY AND RELIABILITY SPECIFICATION

a) ANALYSE THE HAZARDS IN THE OPERATIONAL ENVIRONMENT, AND LEVEL OF DEPENDENCE ON HUMAN PERFORMANCE. CONSIDER POSSIBLE CAUSES OF TECHNICAL FAILURE BY ANALYSES OF DESIGN DOCUMENTS

b) DEFINITION OF REQUIRED RELIABILITY LEVELS
IDENTIFICATION OF CRITICAL ELEMENTS (SAFETY, BUSINESS ETC.)
LIST OF HAZARDS
POTENTIAL FAILURE MODES & CONSEQUENCES

c) ALL DESIGNERS, CLIENTS, USER REPRESENTATIVES? POSSIBLY PUBLIC SAFETY OR REGULATORY AUTHORITIES

d) IF REGULATION REQUIRES REGULATED, THEN THEY MUST. PERSON WITHIN THE DEVELOPMENT ORGANISATION WHO WILL TAKE LEGAL RESPONSIBILITY FOR CONSEQUENCES OF FAILURE

e) IN LAS, MANUAL ALTERNATIVES MIGHT HAVE BEEN DESIGNED-IN TO PREVENT POSSIBLE LOSS OF LIFE DURING SYSTEM FAILURE. CAPSA IS NOT SAFETY CRITICAL BUT COULD HAVE BEEN BUSINESS CRITICAL IN BOTH CASES. RELIABILITY ESTIMATES COULD HAVE

USER REQUIREMENTS DOCUMENT

a) INTERVIEW END-USERS AS WELL AS CLIENT, PERHAPS CONDUCT OBSERVATIONAL FIELD WORK. UNDERSTAND CURRENT SYSTEMS & CONTEXT

b) DESCRIPTION OF CONTEXT, GENERAL AREA OF FUNCTIONALITY, TYPE OF PERSON WHO WILL USE IT, SCENARIOS OF USE (PERHAPS AS USE CASES) INCLUDING IF POSSIBLE PROTOTYPES OR SCREEN SHOTS AS WELL AS NARRATIVE

c) CLIENTS, END-USERS, INTERFACE DESIGNERS

d) CLIENTS (AND POSSIBLY USER REPRESENTATIVES, AT CLIENT DISCRETION)

e) IN LAS, USER GROUP WAS RELATIVELY SMALL, SKILLED, COULD BE TRAINED TO USE NEW SYSTEM, BUT MAY NOT HAVE FOUND IT EASY TO COMPARE TO MANUAL VERSION. IN CAPSA, PROMISED USER CONSULTATION NEVER OCCURRED - WOULD PROBABLY HAVE RESULTED IN THE ORACLE APPROACH BEING SCRAPPED (THOUGH THERE WAS NO SERIOUS ALTERNATIVE, SO PERHAPS BEST IN THE LONG RUN THAT SOMETHING WAS BUILT, EVEN IF UNPOPULAR)

TEST SPECIFICATION

a) DATA COMES FROM DESIGN DOCUMENTS, BOTH AT MODULE LEVEL (FOR WHITE BOX TESTING) AND INTERFACE SPECIFICATIONS

b) OVERALL TEST STRATEGY, MODULE TEST PLAN, INCLUDING SPECIFICATION OF ANY TEST STUBS TO BE WRITTEN, SYSTEM TESTS AND TOOLS TO BE USED TO EXERCISE EXTERNAL & USER INTERFACES, CRITERIA FOR SUCCESS, TESTING SCHEDULE?

c) SYSTEM DESIGNERS, TEST ENGINEERS

d) PROJECT MANAGER (PERHAPS IN CONSULTATION WITH CLIENT)

e) IN LAS, TESTING WAS PRESUMABLY CARRIED OUT, BUT FAILED TO SIMULATE ABSOLUTE LOAD CONDITIONS. BETTER (BUT MORE COSTLY) TESTING HARNESSES MAY HAVE HELPED HERE. IN CAPSA, TESTING WASN'T DONE AS A RESULT OF SCHEDULE SLIPPAGE, SO A SPECIFICATION MIGHT SIMPLY HAVE DRAWN ATTENTION TO WHAT HADN'T BEEN DONE.

28 MINUTES TO ANSWER

MARKING GUIDE FOR S/W ENGINEERING & DESIGN (PAPER 10, QUESTION 12) 2004

THERE ARE 5 MARKS TO BE AWARDED FOR EACH OF THE 4 DOCUMENTS (TOTAL 20 MARKS). MOST OF THESE CAN BE ANSWERED IN A VARIETY OF WAYS, GIVING STUDENTS OPPORTUNITY TO DRAW ON AREAS OF THE COURSE THEY ARE FAMILIAR WITH

a) - SHOULD DEMONSTRATE RELEVANT ANALYTIC OR EMPIRICAL APPROACH TO GAIN MARK

b) - SHOWS THAT THEY UNDERSTAND WHAT IS MEANT BY THE TITLE I HAVE GIVEN

c) - SHOW THAT THEY UNDERSTAND ORGANISATION OF PROJECT TEAMS, AND FLOW OF INFORMATION WITHIN THE TEAM

d) - SHOW THAT THEY UNDERSTAND THE COMMERCIAL ENVIRONMENT / LEGAL RESPONSIBILITIES

e) - SHOW UNDERSTANDING OF CONSEQUENCES OF ENGINEERING FAILURE, IN CONTEXT OF THESE SPECIFIC CASE STUDIES.