USE CASES PRESENTATION

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SYSTEMS ANALYSIS AND MANAGEMENT

This is an introductory course in systems analysis for computer-based information systems. Systems analysts are primarily responsible for eliciting user requirements, proposing a systems solution that meets those requirements, and creating a model of the requirements and a proposed solution that can be understood by both system users and system developers. Systems analysts also get involved in project identification, planning, management, supervision of detailed system design and supervision of system construction. While this course will specifically emphasize systems analysis for LIS applications, the knowledge, tools and techniques that are covered in the course would be equally applicable to other disciplines. The audience for this course includes anyone who is interested in the analysis and preliminary design of computer-based information systems.

COURSE TOPICS (1 OF 3)

- INTRODUCTIONS

- REVIEW OF SYLLABUS AND COURSE SCHEDULE

- UNDERSTANDING THE ROLE OF THE SYSTEMS ANALYST

- WHAT SYSTEMS ARE OF INTEREST TO THE LIS COMMUNITY (LIBRARIES, MUSEUMS, ARCHIVES, RESEARCH COMPUTING CENTERS, ETC.)

- WHAT RESOURCES ARE AVAILABLE TO LEARN ABOUT AND STAY CURRENT ON THESE SYSTEMS?

- UNDERSTANDING SYSTEMS PROJECT LIFECYCLES GENERALLY

- UNDERSTANDING THE LIFECYCLE OF YOUR STUDENT PROJECT SPECIFICALLY

COURSE TOPICS (2 OF 3)

- IDENTIFYING PROJECT STAKEHOLDERS

- UNDERSTANDING AND CONTROLLING PROJECT SCOPE

- IDENTIFYING AND UNDERSTANDING THE PROBLEM OR OPPORTUNITY

- UNDERSTANDING METHODS FOR GATHERING REQUIREMENTS.

- DEVELOPING A REQUIREMENTS GATHERING PLAN

- EXPRESSING REQUIREMENTS WITH USE CASES

- CREATING USE CASE DIAGRAMS

- REVIEW PROJECT PLAN DRAFTS

- CREATING USE CASE SPECIFICATIONS

COURSE TOPICS (3 OF 3)

- CREATING ACTIVITY DIAGRAMS TO AUGMENT USE CASE SPECIFICATIONS

- IDENTIFYING AND DOCUMENTING ANY REMAINING NON-FUNCTIONAL SPECIFICATIONS

- MODELING DATA REQUIREMENTS USING CLASS DIAGRAMS

- REFINING CLASS DIAGRAMS TO COMPLEMENT THE USE CASE MODEL

- IDENTIFYING IMPORTANT CLASS STATES USING A STATE MACHINE DIAGRAM

- CREATING A PROPOSED DESIGN OF THE USER INTERFACE

- UNDERSTANDING ALTERNATIVE WAYS IN WHICH THE CLASS MODEL MIGHT BE PERSISTED IN A DATA STORE

- UNDERSTANDING OTHER ROLES THAT THE SYSTEMS ANALYST MIGHT PLAY IN THE PROJECT LIFE CYCLE

- STUDENT PRESENTATIONS

HISTORY OF SYSTEMS ANALYSIS APPROACHES

- JUST START CODING.

- CREATE A NARRATIVE FUNCTIONAL SPECIFICATION.

- CREATE A FUNCTIONAL SPECIFICATION USING A SYSTEM OF FORMS (SDM70, ETC.).

- CREATE A PROTOTYPE.

- USE STRUCTURED ANALYSIS (DATA FLOW DIAGRAMS AND STRUCTURED ENGLISH).

- USE OBJECT-ORIENTED ANALYSIS (UML DOCUMENTS AND SUPPORTING MATERIALS).

- USE AGILE DEVELOPMENT METHODOLOGIES (…JUST START CODING???).

- USE AGILE METHODOLOGIES, A VERY LITTLE STRUCTURED ANALYSIS, AND USE CASES.

THE ARCHITECT METAPHOR

- THE SYSTEMS ANALYST IS LIKE THE ARCHITECT OF A SINGLE-FAMILY HOME.

- THE USERS ARE THE FAMILY.

- THE FUNDER IS THE MORTGAGE COMPANY.

- THE ENGINEERS ARE THE DETAILED SYSTEM DESIGNERS.

- THE TRADES-PEOPLE ARE THE PROGRAMMERS, DATABASE ANALYSTS, TESTERS, ETC.

WHAT HAPPENS BEFORE USE CASES

- IDENTIFY STAKEHOLDERS.

- DEVELOP A PROJECT CHARTER.

- GATHER REQUIREMENTS.
  - INTERVIEWING
  - JAD SESSIONS
  - QUESTIONNAIRES

- CONSIDER EXPRESSING SCOPE USING A CONTEXT DIAGRAM.

DEVELOPING USE CASES

- IDENTIFY ACTORS.

- IDENTIFY USE CASES.

- CREATE USE CASE DIAGRAM(S).

- CREATE USE CASE SPECIFICATIONS.

- AUGMENT USE CASE SPECIFICATIONS WITH ACTIVITY DIAGRAMS.

THE ANONLIS WEBSTORE SYSTEM

- THE ANONLIS WEBSTORE CASE INTRODUCTION (SEPARATE DOCUMENT)

THE ANONLIS WEBSTORE CONTEXT DIAGRAM

- SEPARATE DOCUMENT

- THE MOST VALUABLE CONTRIBUTION THAT STRUCTURED ANALYSIS CAN PLAY IN MODERN SYSTEMS ANALYSIS

EXPRESSING REQUIREMENTS WITH USE CASES

- IDENTIFY THE ACTORS.

- IDENTIFY THE USE CASES.

- DRAW A CONFORMING UML USE CASE DIAGRAM.

IDENTIFYING THE ACTORS

- ACTORS ARE ROLE PLAYERS WHO GET THE BENEFITS OF SYSTEM FUNCTIONALITY.

- ACTOR NAMES ARE ROLE NAMES (ORDER PICKER).

- ACTOR NAMES ARE NOT JOB TITLES (STOCK CLERK II).

- ACTOR NAMES ARE NOT NAMES OF PEOPLE (ALISON WILSON).

IDENTIFY THE USE CASES

- USE THE "THREE LITTLE BEARS" APPROACH.

- THE USE CASE NAME MUST NOT BE TOO SMALL: VALIDATE ATM CARD.

- THE USE CASE NAME MUST NOT BE TOO BIG: COMPLETE BANKING TRANSACTIONS.

- THE USE CASE NAME MUST BE "JUST RIGHT":   WITHDRAW CASH.

DRAW A PROPER UML USE CASE DIAGRAM

- ACTORS ARE STICK FIGURES.

- ACTORS CAN BE SYSTEMS AS WELL AS INDIVIDUALS.

- A BOUNDARY LINE SEPARATES THE USE CASES FROM THE ACTORS.

- EACH USE CASE IS REPRESENTED BY AN ELLIPSE.

- ACTORS THAT PARTICIPATE IN A USE CASE ARE CONNECTED TO THE ELLIPSE WITH A LINE.

BEWARE OF THE FANCY USE CASE FEATURES

- USE CASES MAY HAVE <<INCLUDES>> RELATIONSHIPS.

- USE CASES MAY HAVE <<EXTENDS>> RELATIONSHIPS.

- AVOID MAKING USE OF THESE RELATIONSHIPS ON THE FIRST PASS.

- MANY EXPERTS WOULD HAVE YOU AVOID THESE RELATIONSHIPS ALTOGETHER.

- WE WILL COVER THESE RELATIONSHIPS AT THE VERY END OF THIS UNIT.

HOW MANY USE CASE DIAGRAMS TO CREATE?

- UML PROVIDES FOR GROUPING USE CASES IN "PACKAGES".

- THE TOTAL OF THE USE CASES EXPRESSED IN ALL OF THE PACKAGES REPRESENTS THE SCOPE OF THE PROJECT.

- SMALL PROJECTS CAN BE PACKAGED LIKE THIS:
  - BUSINESS USE CASES
  - ADMINISTRATIVE USE CASES

- LARGER PROJECTS WILL HAVE TO BE PACKAGED IN SOME MORE ELABORATE WAY.

- CONSIDER CREATING A PACKAGE FOR EACH GROUP OF USERS.

THE USE CASE SPECIFICATION

- USE CASE DIAGRAMS HAVE A VERY LIMITED USEFULNESS:
  - THEY EXPRESS THE SCOPE OF THE PROJECT.
  - THEY ALLOW THE SYSTEMS ANALYST TO SHOW EACH USER GROUP WHICH PARTS OF THE SYSTEM THAT THEY WILL INTERACT WITH.

- REMEMBER TO ALWAYS USE THE TEMPLATE PROVIDED.

- COMPLETE EACH SECTION USING THE INSTRUCTIONS PROVIDED.

- REMEMBER THAT THE PURPOSE OF THIS DOCUMENT IS TO DESCRIBE HOW THE ACTOR INTERACTS WITH THE SYSTEM TO REACH THE ACTOR'S JOB GOAL.

THE BASIC FLOW

- TELLS THE STORY OF THIS SYSTEM INTERACTION WITH THE SIMPLICITY OF A CHILDREN'S STORY.

- AVOID USING PROGRAMMING CONSTRUCTS LIKE IF-THEN-ELSE.

- THIS FLOW TELLS THE STORY OF WHAT HAPPENS DURING A NORMAL TRANSACTION.

- UNUSUAL CONDITIONS ARE NOT ADDRESSED IN THE BASIC FLOW (BUT THEY ARE ADDRESSED LATER).

- THIS FLOW IS SOMETIMES CALLED THE "HAPPY PATH" OR THE "HAPPY DAY SCENARIO".

- THE FLOW SHOULD ALWAYS SAY EXPLICITLY WHEN "THE USE CASE STARTS…" AND WHEN "…THE USE CASE ENDS".

ALTERNATE FLOWS

- EACH ALTERNATIVE FLOW DESCRIBES A CASE WHERE SOMETHING UNUSUAL HAS OCCURRED IN ANOTHER FLOW. NOW, ALTERNATIVE PROCESSING MUST BE DONE.

- EACH ALTERNATIVE FLOW BEGINS BY IDENTIFYING HOW FLOW COMES TO THIS POINT (FROM WHAT PLACE).

- THEN, THE FLOW TELLS THE STORY OF HOW PROCESSING CONTINUES UNTIL THE END OF THE FLOW.

- WHEN THE FLOW CONCLUDES, IT MUST SAY EXPLICITLY EITHER:
  - THAT "THE USE CASE ENDS", OR
  - AT WHICH POINT IN SOME OTHER FLOW, PROCESSING WILL CONTINUE.

PRE-CONDITIONS

- THESE ARE CONDITIONS THAT MUST BE MET BEFORE THE USE CASE MAY START.

- THEY DESCRIBE A STATE OF THE SYSTEM THAT MUST EXIST OR NOT EXIST BEFORE USE CASE MAY START.

- MOST OFTEN, THESE ARE EXPRESSED IN TERMS OF OTHER USE CASES THAT MUST HAVE EXECUTED SUCCESSFULLY BEFORE THIS USE CASE IS ALLOWED TO START.

POST-CONDITIONS

- THESE DESCRIBE THE STATE OF THE SYSTEM WHEN THE USE CASE HAS ENDED.

- IF THE USE CASE MAY END IN MORE THAN ONE WAY (SUCCESSFUL VS. UNSUCCESSFUL), THEN BOTH STATES MUST BE DESCRIBED.

EXTENSION POINTS

- THESE ARE PLACES WHERE OTHER USES CASES WILL EITHER BE <<INCLUDED>> OR THIS USE CASE MAY BE <<EXTENDED>>.

- WE WILL COVER THESE SITUATIONS IN A LATER CLASS.

KEY SCENARIOS

- EACH SCENARIO DESCRIBES AN EXPECTED COMBINATION OF EVENTS WITHIN THE FLOWS DESCRIBED ABOVE.

- AT A MINIMUM, THERE SHOULD BE ONE SCENARIO THAT DOCUMENTS THAT THE BASIC FLOW IS EXPECTED TO OCCUR.

- OTHER IMPORTANT COMBINATIONS OF EVENTS THAT FLOW THROUGH THE USE CASE SHOULD ALSO BE DOCUMENTED HERE.

OTHER DIAGRAMS

- KEY SCENARIOS ARE OFTEN FURTHER EXPLAINED USING UML ACTIVITY DIAGRAMS. THESE DIAGRAMS WILL BE COVERED IN THE NEXT UNIT.

THE MORAL OF THE STORY

- USE CASES TELL US EXPLICITLY HOW ACTORS WILL INTERACT WITH THE SYSTEM TO REACH GOALS THAT ARE RELEVANT TO THEIR JOBS.

- USE CASES USUALLY LEAVE SPECIFICS OF INTERACTION DESIGN VAGUE SO THAT DESIGNERS CAN FILL IN THE DETAILS AT THE NEXT STAGE OF THE PROJECT.

- THE SYSTEMS ANALYST CAN REVIEW THE USE CASE WITH SYSTEM USERS TO MAKE SURE THAT THEY UNDERSTAND EACH OTHER ON ISSUES OF HOW THE USERS WILL INTERACT WITH THE SYSTEM.

- THE SYSTEMS ANALYST CAN ALSO REVIEW THE USE CASE WITH SYSTEM BUILDERS TO EVALUATE THE FEASIBILITY OF THE REQUIREMENTS AS THEY HAVE BEEN DOCUMENTED.