Introduction to Data Management and Information Systems for Evaluation Practitioners

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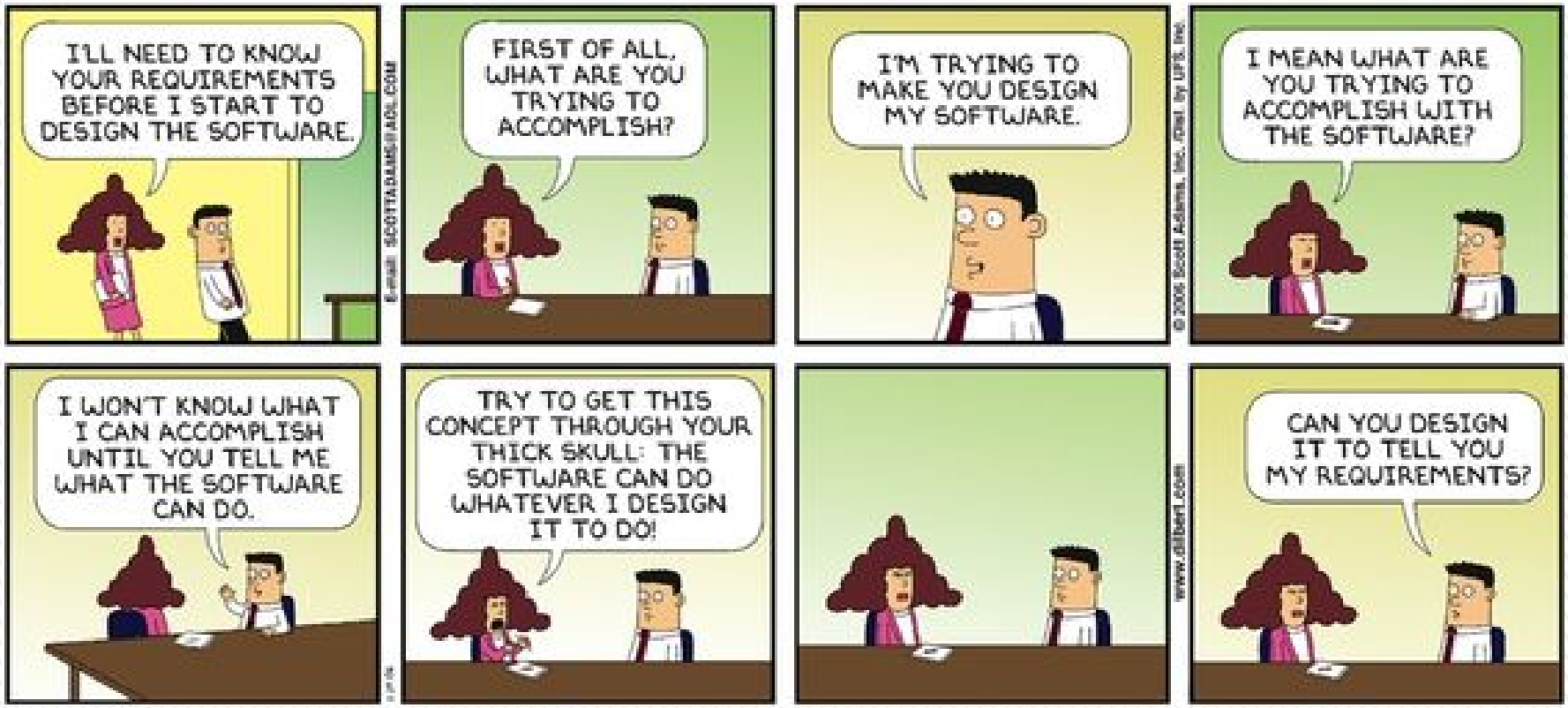

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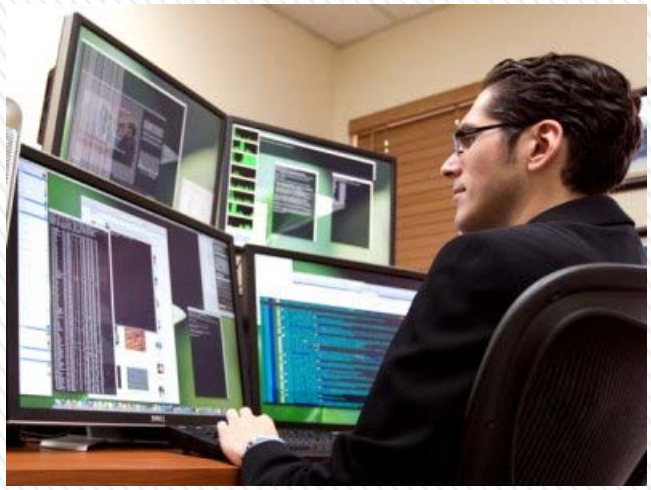

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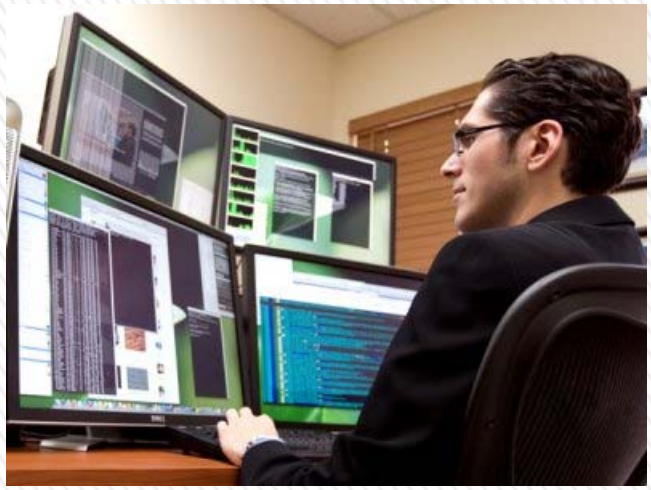

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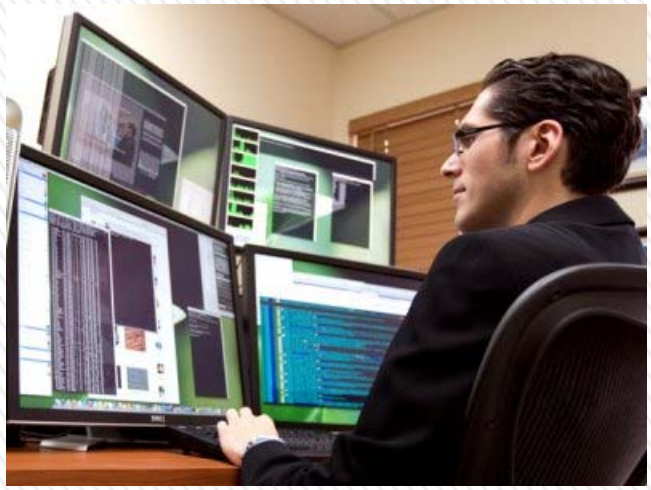
Graphical tools for communication



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Target audience

- As an evaluator you might be asked to determine how information flows within an organization
- You might need to develop a new information system to support your evaluation tasks

- But I won't be teaching you how to set up the basic format of an Excel spreadsheet

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In this session

- I shall introduce you to a number of diagrams that provide that useful communication mode between your evaluator and your IT guy.

- I shall give examples of these using a real-life project where I am currently supervising 4 IT students at the University of Queensland who are developing an information system for clinical trials (almost identical to a system for collecting online surveys)

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In this session

- I shall then give you time for developing the diagrams for your own information system (an information system for managing registrations and abstracts for a conference)
- This gives you an opportunity to think about how you can use these diagrams in practice, but to also observe the person beside you as you negotiate what your information system should look like

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Diagram 1 – Use case diagram

- As we start thinking about our information system we will begin by thinking at a top level about the different types of users who might interact with our information system and the different tasks that they will want to perform.

- A use case refers to each task an actor (user) might perform.

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Diagram 1 – Use case diagram

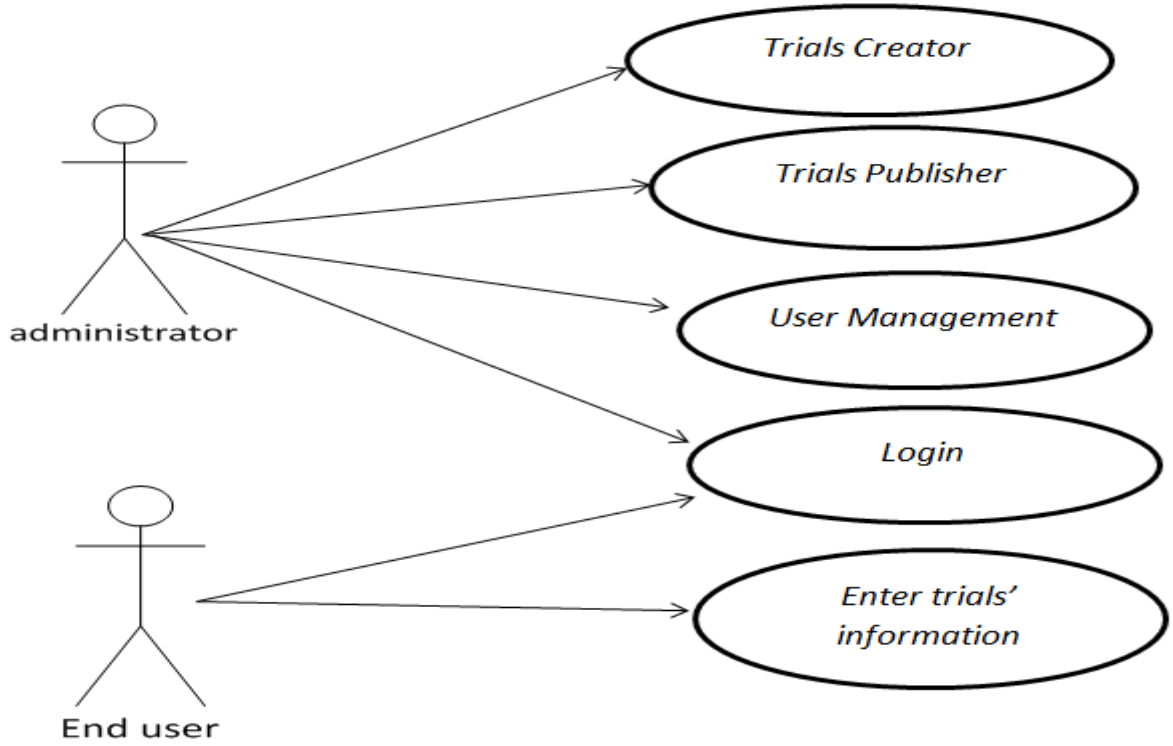

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Diagram 2 – state space diagram

- Most of you are familiar with a flow chart. Where in the realm of information systems we refer to such a diagram as a state space diagram.

- Within such a diagram we will unpack one of the tasks shown in the use case diagram and will consider the various steps involved in completing that task.

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Diagram 2 – state space diagram

- Such a diagram might consider optional paths depending upon the information provided by the user

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Diagram 2 – state space diagram

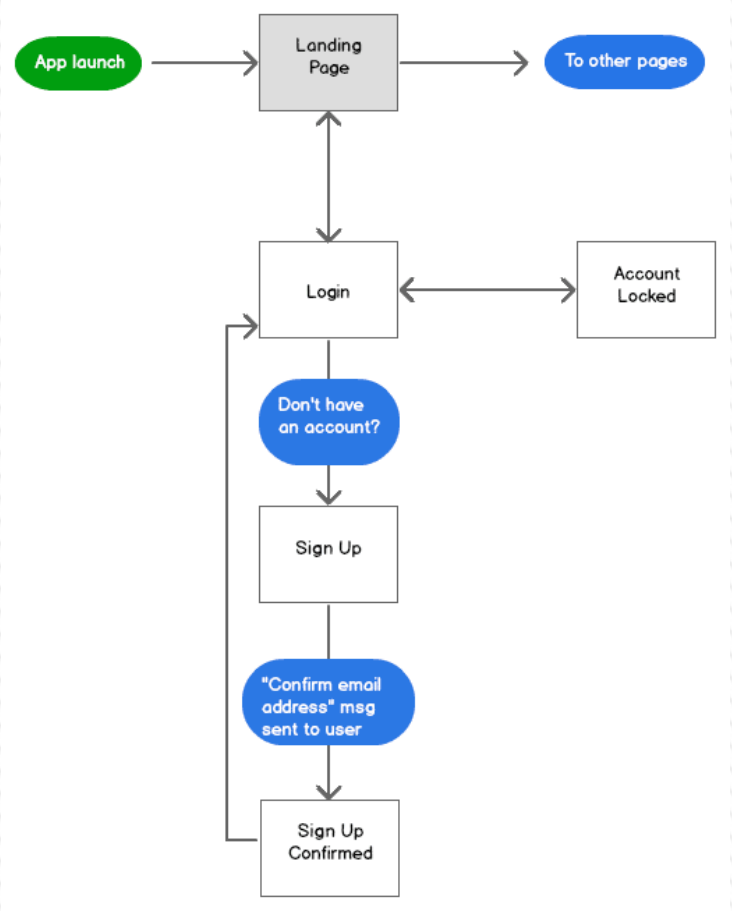

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Diagram 3 – sequence diagram

- As we consider the various steps involved in completing a task we will find that many tasks involve an exchange of information between different types of users.
- For example, user login may involve an exchange between the user (who wants a new password) and an administrator (who will determine whether the user is eligible to receive a new password).

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Diagram 3 – sequence diagram

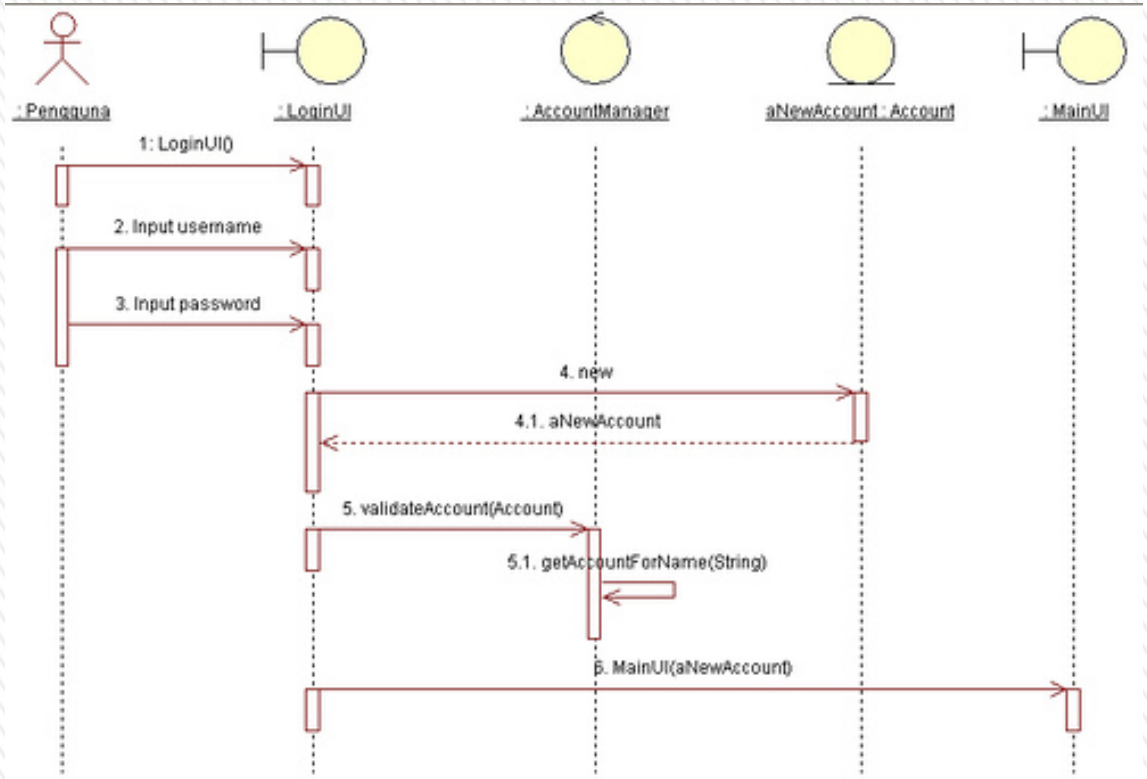

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Diagram 4 – ER diagram

- Now that we have identified the steps involved in completing a task, we are ready to consider the underlying database behind such a system.
- We call this new diagram an Entity Relationship Diagram.
- For our example of a clinical trial / online survey we have a number of different entities (users, clinical trials, and variables or survey questions)

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Diagram 4 – ER diagram

- Each entity then has a number of attributes

- For example, a survey question might have:
  - a displayed version – “What is your gender?”
  - a shorthand version – “gender”
  - A question type (text string or number)

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Diagram 4 – ER diagram

- Then between each pair of entities we have the concept of Cardinality.

- For example each survey might consist of a number of questions, hence we might say that there is a 1 to N matching

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Diagram 4 – ER diagram

- Options are
  - 1 to 1 – for each survey we have exactly one survey question
  - 1 to 0:1 – for each survey we may or may not have a manager for that survey
  - 1 to 0:N – for each survey we might have 0, 1, or more than 1 users allocated to that survey
  - 1 to 1:N – for each survey we might have 1 or more survey questions

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Diagram 4 – ER diagram

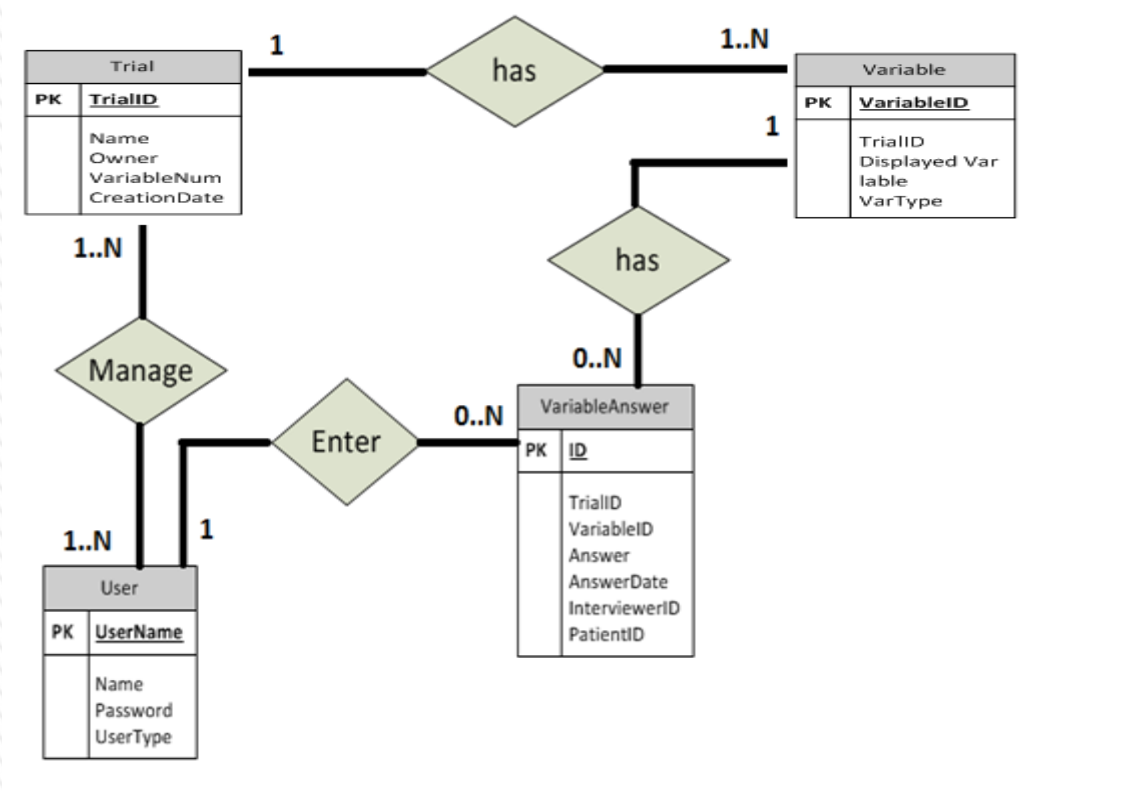

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Diagram 5 – website design

- In designing each page of your website you need to consider two things
  - Functional requirements - What is the functional task which the user will be completing on that page (what information do I need to display to the user and what information am I trying to obtain from the user)
  - You will obtain these functional requirements from your state space, sequence, and ER diagrams

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Diagram 5 – website design

- In designing each page of your website you need to consider two things
  - Non-functional requirements – How do I make the page graphically appealing to the user
  - What colours will I use?
  - What size for the fonts and images?

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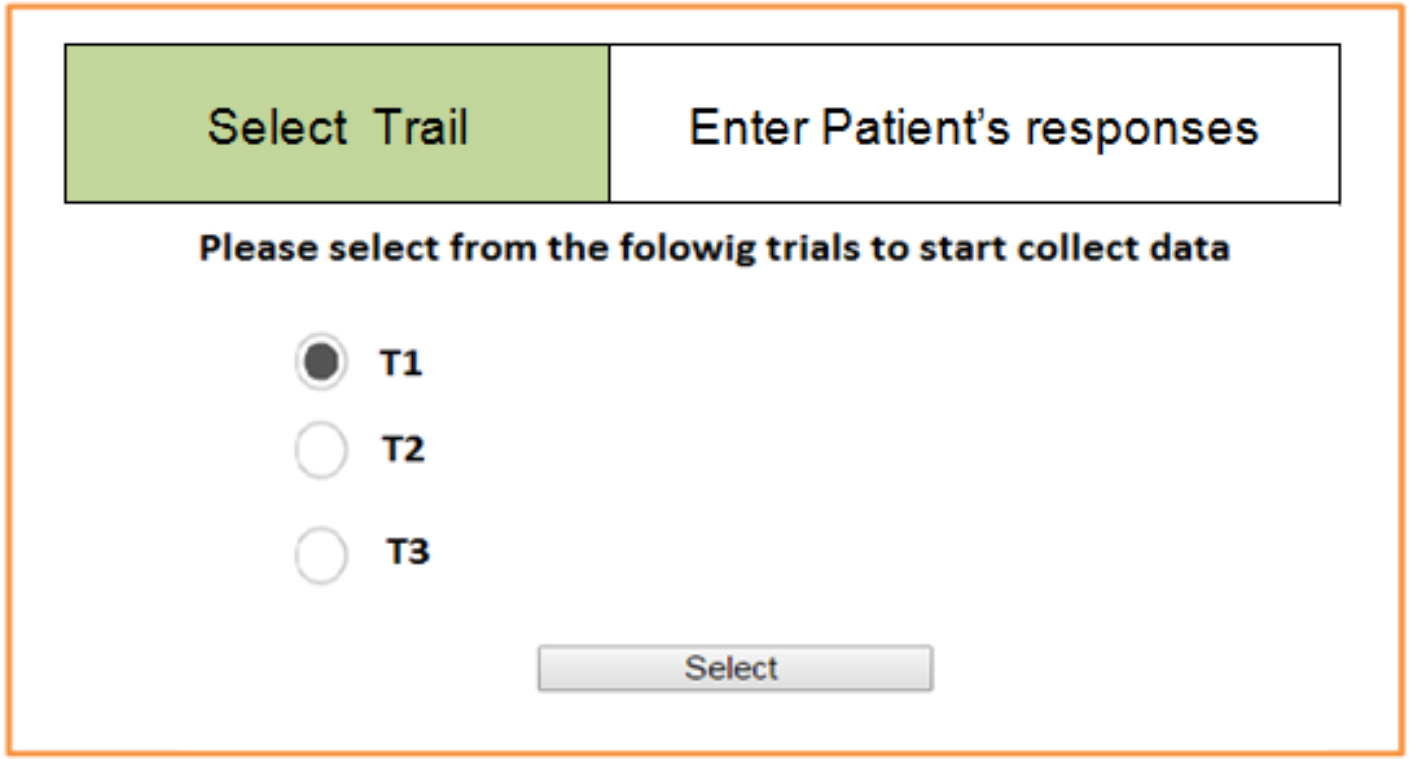
Diagram 5 – website design



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Review of diagrams

- Use case diagrams
- State space diagrams
- Sequence diagrams
- Entity Relationship diagrams
- Website design

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Now it's your turn

- I am going to ask you to get out pen and paper and to turn to the person beside you and together to design an information system for managing delegate registration and abstract submission for a conference.

- Users you might want to consider are – delegates, program committee, financial officer

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Now it's your turn

- Tasks you might want to consider are – registering and paying for the conference, submitting an abstract, having the program committee decide on accept/reject for your abstract

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Now it's your turn

- As you complete this task I will ask you both to consider the usability of the diagrams that we have just discussed, as well as to consider the process of negotiating this process of collecting information system requirements from the person beside you (what factors added or subtracted to the task of collecting these requirements)

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Diagram 1 – Use case diagram

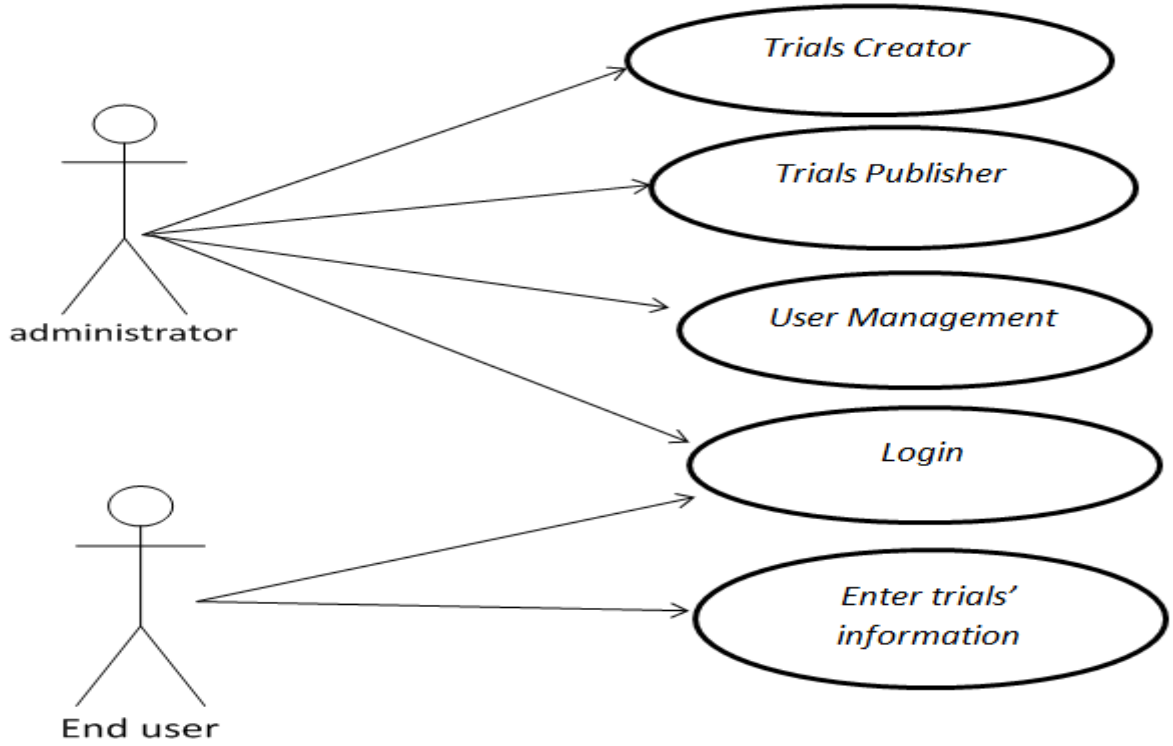

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Diagram 2 – state space diagram

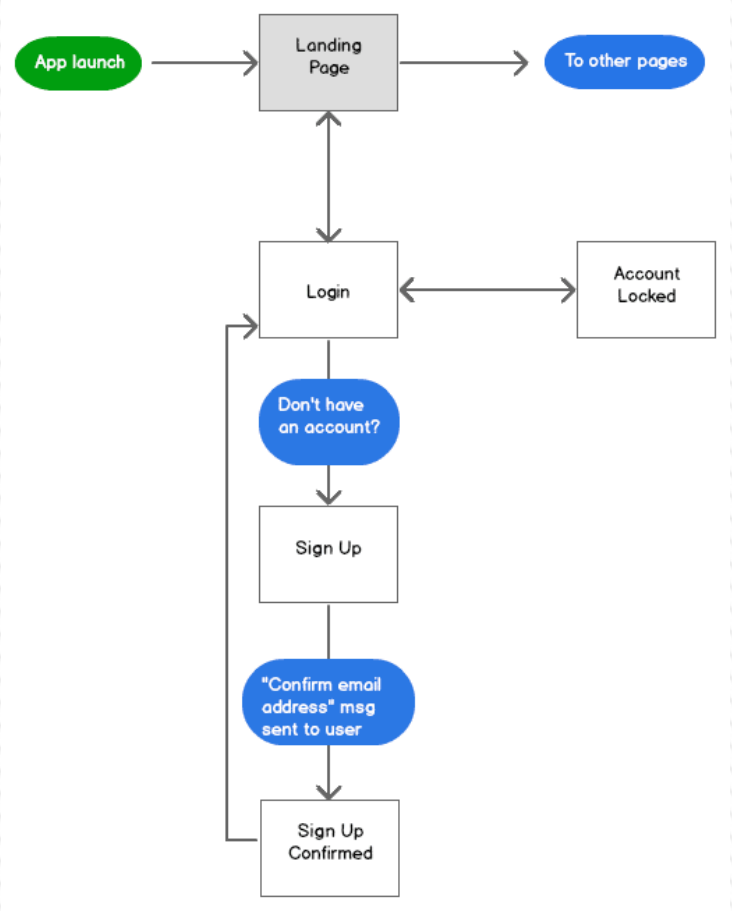

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Diagram 3 – sequence diagram

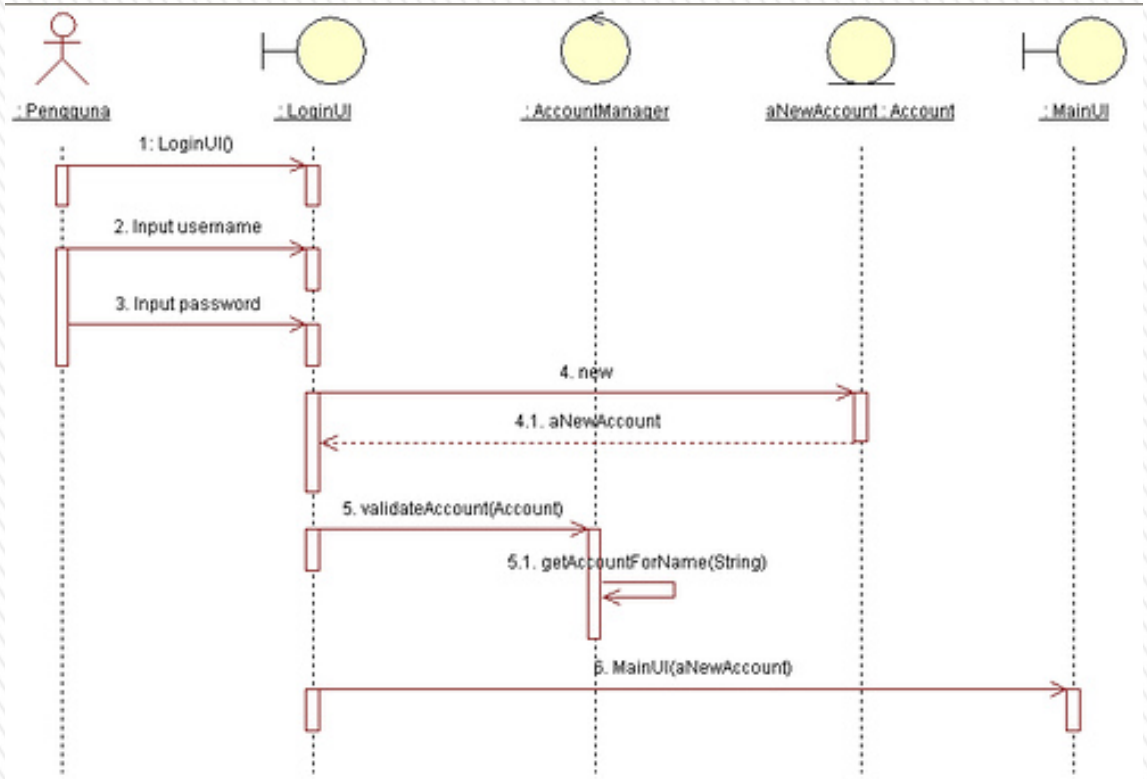

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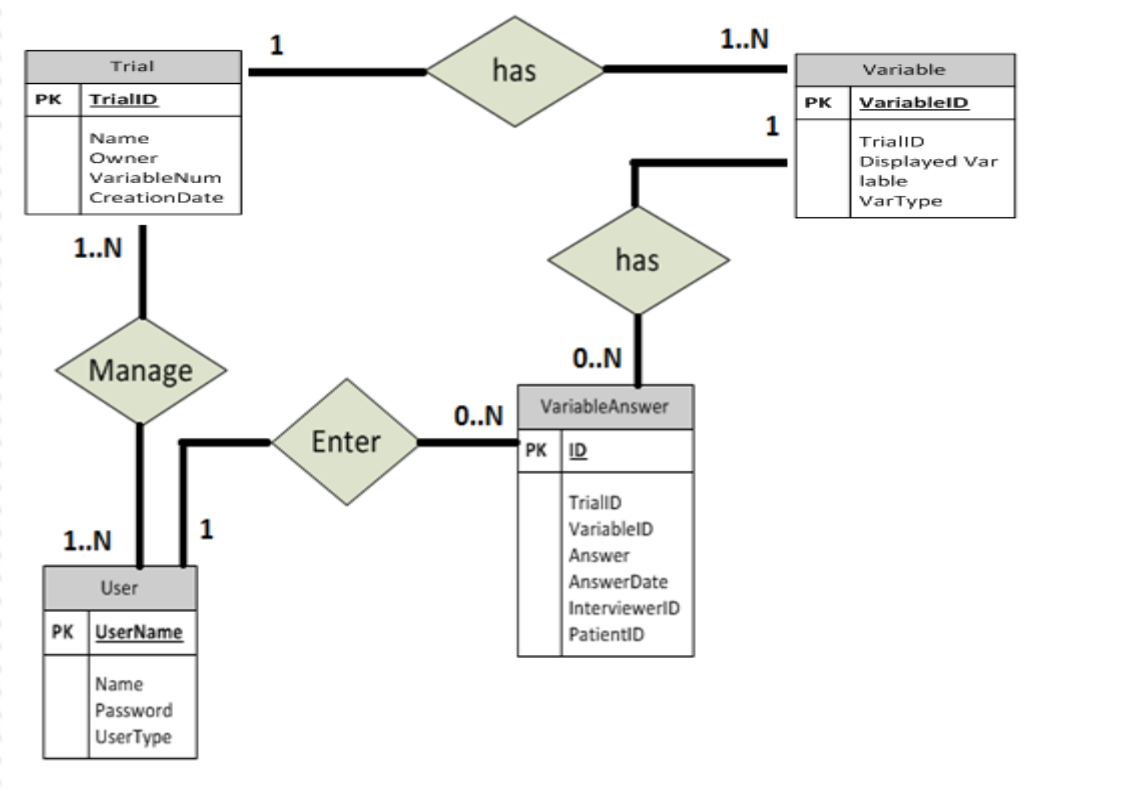
Diagram 4 – ER diagram



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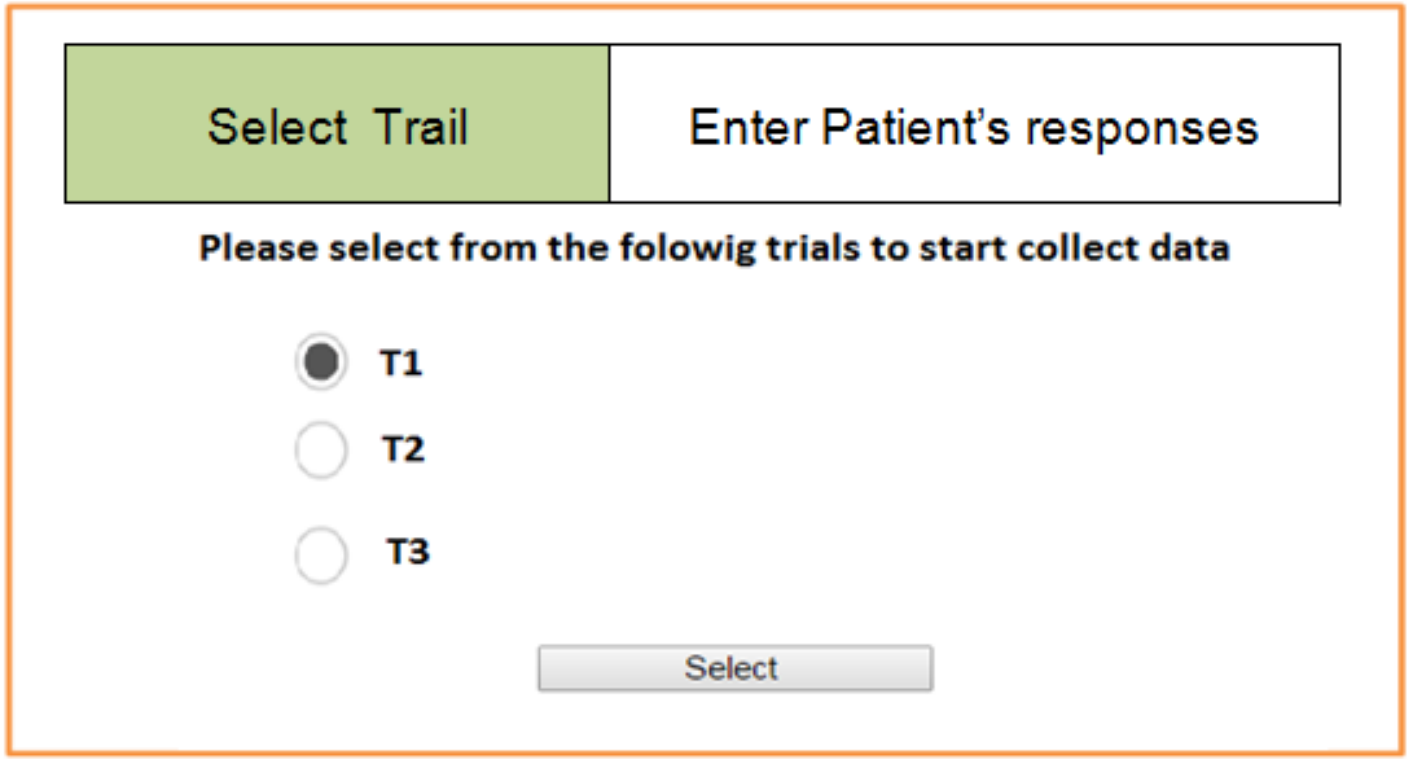

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Almost the end …

- Let me make some final comments on free software for implementing such an information system (goodies for your IT guy), and then we'll bring this session to a close.

- A standard set of software for implementing such a solution consists of HTML, SQL and PHP

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Software

- HTML – for producing the webpage that the users will see (this is a language that all internet browsers understand, you do not need special software to code in HTML)
- SQL – for managing the underlying database in your system (a free version of SQL can be found at https://www.mysql.com)
- PHP – the language that communicates between HTML and SQL (https://secure.php.net)

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The end

- Graphical tools are useful for bridging that level of understanding between yourselves as evaluators and your IT guys
- Use case diagrams, State space diagrams, Sequence diagrams, Entity Relationship diagrams, Website design
- We concluded with some brief comments on free software for implementing your information system – HTML, SQL, PHP

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