A modern, open-plan office space with exposed brick walls and a wooden ceiling with visible ductwork. Several people are working at long wooden desks equipped with multiple computer monitors. In the foreground, there is a brown leather sofa and a small table with a potted plant. Large windows on the right side provide natural light. A semi-transparent dark blue rectangle is overlaid on the left side of the image, containing the title text.

# Digital Information Systems Role of the Systems Analyst

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# Introduction

Companies use information as a weapon in the battle

- to increase productivity
- deliver quality products and services
- maintain customer loyalty
- make sound decisions

**Information Technology can mean the difference between success and failure**



## **Business Systems Analysis also called Systems Analysis**

- Step by step process for developing high quality information systems

## **What Does a Business/Systems Analysts Do?**

- Plan, develop, and maintain information systems
- Also manages IT projects, including tasks, resources, schedules, and costs
- Conducts meetings, delivers presentations, and writes memos, reports, and documentation
- **Organisations have long recognised the importance of managing key resources such as people and raw materials. Information has now moved to its rightful place as a key resource.**



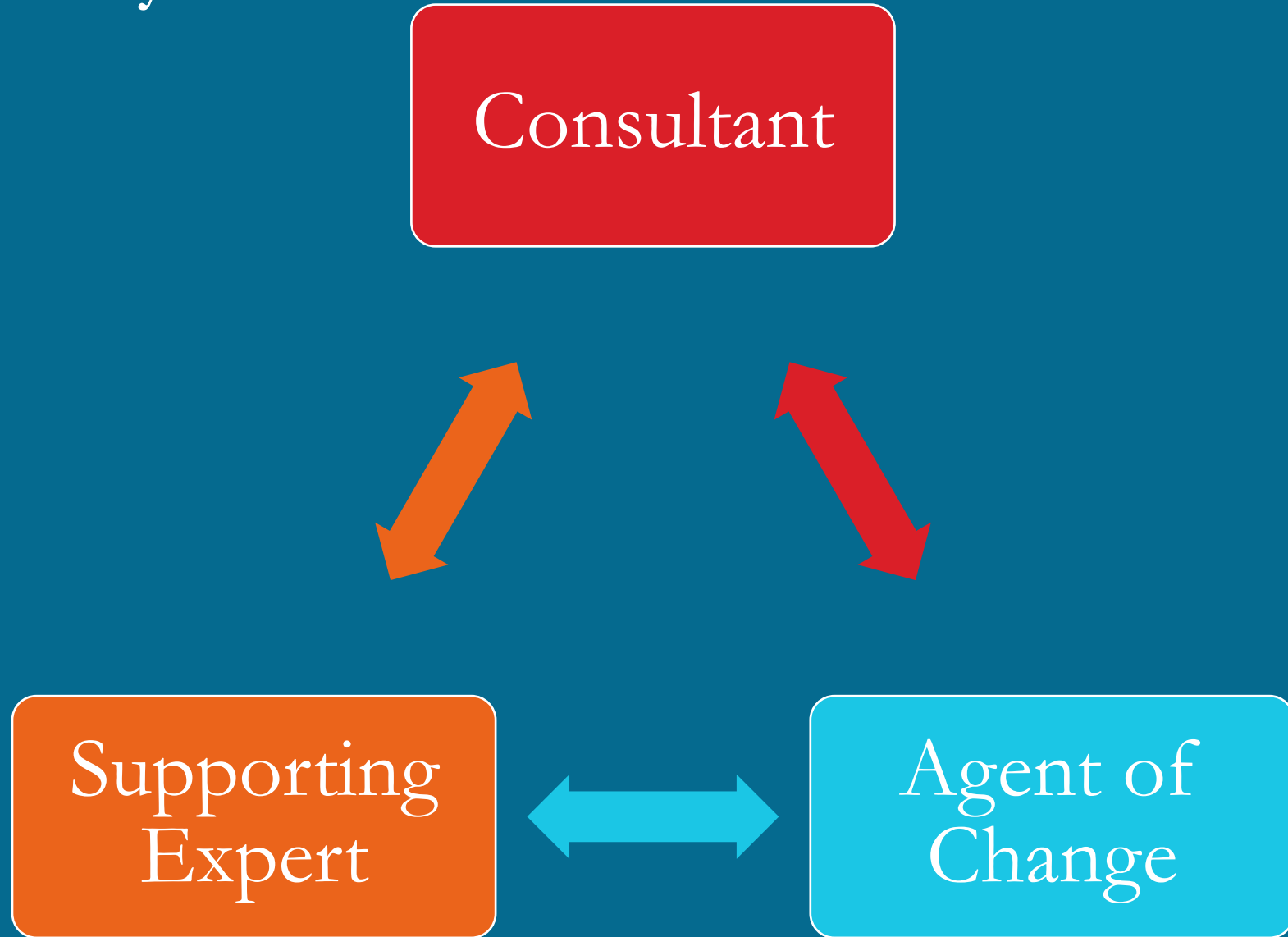
- + Systems analysis and design is performed by systems analysts, and it is used to understand what people need by systematically analysing data input or data flow, process or transform data, store data, and output information in the context of a particular organisation or enterprise.
- + A systems analyst seeks to identify and solve the right problems by performing a thorough analysis of the client's system.

- + Systems analysis and design is used to analyse, design, and implement improvements to computerised information system that support users and the functions of the business.
- + Developing a system without proper planning leads to great user dissatisfaction and frequently causes the system to fall into disuse.
- + Systems analysis and design brings structure to the analysis and design of information systems, a costly endeavour that might otherwise have been done in a haphazard way.
- + **Systems analysis involves working with current and eventual users of information systems to support them in working with technologies in an organisational setting.**

It can be taught of as a series of processes systematically undertaken to improve a business through the use of computerised information systems.



# Roles of Systems Analysts



A systems analyst assesses how users interact with technology and how businesses function by examining the inputting and processing of data and the outputting of information with the intent of improving organisational processes.



As a supporting expert analysts draw on professional expertise in hardware, software, programming etc. In this role you are not managing a project; you are merely serving as a resource for those who are.

The most responsible role is as an agent of change whether internal or external to a business. Your presence in the business changes it. You need to recognise this and use it as a starting point in your analysis

**There is a number of approaches analysts can take to analyse and design an information system?**

- Systems Development Lifecycle (SDLC) one type is the Waterfall Method
- Agile Approach
- Object Orientated Approach

**There are others we will look at later in the module too**

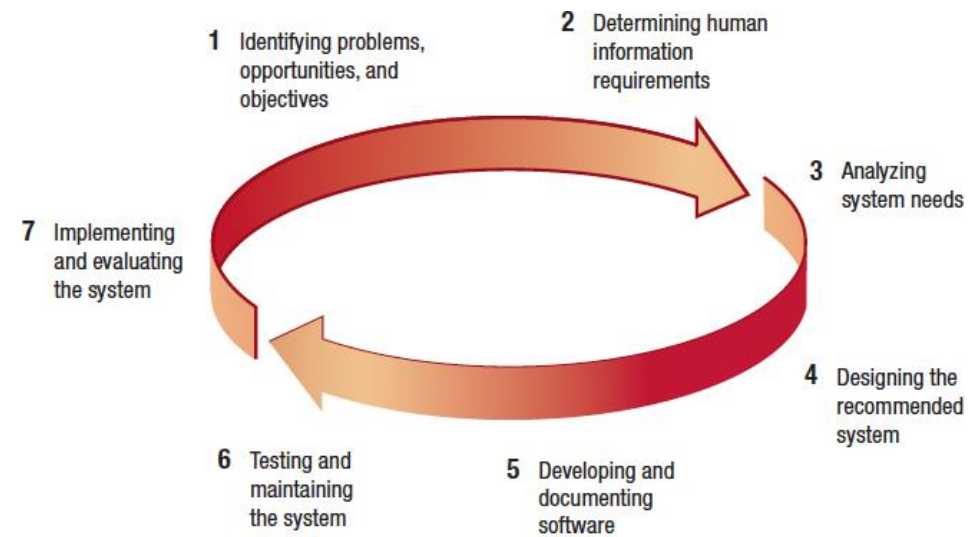
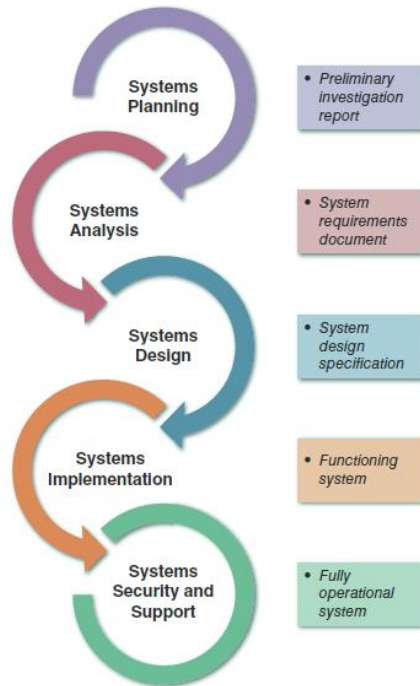




# Systems Development Lifecycle (SDLC)

- + The classical approach to develop a system.
- + It consists of different phases which need to be completed in strict sequential order.
- + The phases are shown with their related activities on Moodle.
- + Analysts disagree on exactly how many phases there are in the SDLC

# Stages of the SDLC



# Identifying Problems, Opportunities and Objectives

- + In this first phase the analyst is concerned with correctly identifying problems, opportunities and objectives.
- + This stage is critical to the success of the rest of the project because no one wants to waste time addressing the wrong problem.
- + It requires the analysts to look honestly at what is occurring in a business and pinpoint problems.
- + Others often bring up these problems and they are the reason the analyst was initially called.



- + Opportunities are situations that the analyst believes can be improved through the use of information systems.
- + **What is it the business is trying to do?**
- + Then the analyst will be able to see whether some aspects of information systems applications can help the business reach its objectives by addressing specific problems or opportunities.
- + Activities in this phase consist of interviewing user management, summarising the knowledge obtained, estimating the scope of the project, and documenting the results.
- + The output of this phase is feasibility report that contains a problem definition and summarises the objectives.

## + Activity:

- Interviewing user management

- Summarizing the knowledge obtained

- Estimating the scope of the project

- Documenting the results

## + Output:

- Feasibility report containing problem definition and objective summaries from which management can make a decision on whether to proceed with the proposed project

# Determining Human Information Requirements

- + The analyst determines the human needs of users involved, using a variety of tools to understand how users interact in the work context with their current information systems.
- + The analyst will pose and answer many questions concerning HCI.
  - What are the users' physical strength and limitations?
  - In other words:
  - What needs to be done to make the system audible, legible and safe?
  - How can the new system be designed to be easy to use, learn and remember?
  - How can the system be made pleasing or even fun?
  - How can the system support a user's individual work tasks and make them more productive in new ways?



- + We are striving to understand what information users need to perform their jobs.
- + How do we make the system useful to the people involved?
- + What new tasks are enabled by the new system that users were unable to do without before?
- + How can the system extend the user's capabilities beyond what the old system provided?

People involved in this phase

Who, what, where, when  
and how

# Analysing System Needs

- + This stage involves analysing system needs.
- + Special tools and techniques are used to help the analysts make requirements determination.
- + Data flow diagrams (DFD) chart the input, processes and output of the business functions.
- + Analysts prepare a system proposal that summarises what has been discovered about the
  - Users, Usability and Usefulness of current systems.
  - Cost benefit analysis of alternatives and make recommendations on what (if anything) should be done.



# Designing the Recommended System

- + In the design phase of SDLC, the systems analysts use the information collected earlier to accomplish the logical design of the information system.
- + The analyst designs procedures for users to help them accurately enter data so that data going into the information system is correct.
- + The analyst provides for users to complete effective input to the information system by using techniques of good form, web page and screen design.

# Developing and Documenting Software

- + The analyst works with coders to develop any original software that is needed.
- + During this phase the analyst works with users to develop effective documentation for software, including procedure manuals, online help and websites featuring FAQ's.
- + Users are involved from the beginning; documentation should address the questions they have raised and solved jointly with the analyst.
- + Coders have a key role in this phase because they design, code and remove syntax errors from computer programs.
- + To ensure quality a coder may conduct either a design or a code walkthrough explaining complex portions of the software to a team of other coders.

# Testing and Maintaining the System

- + Before an information system can be used, it must be tested
- + It is much less costly to catch problems before rather than after the system is signed over to users.

# Implementing and Evaluating the System

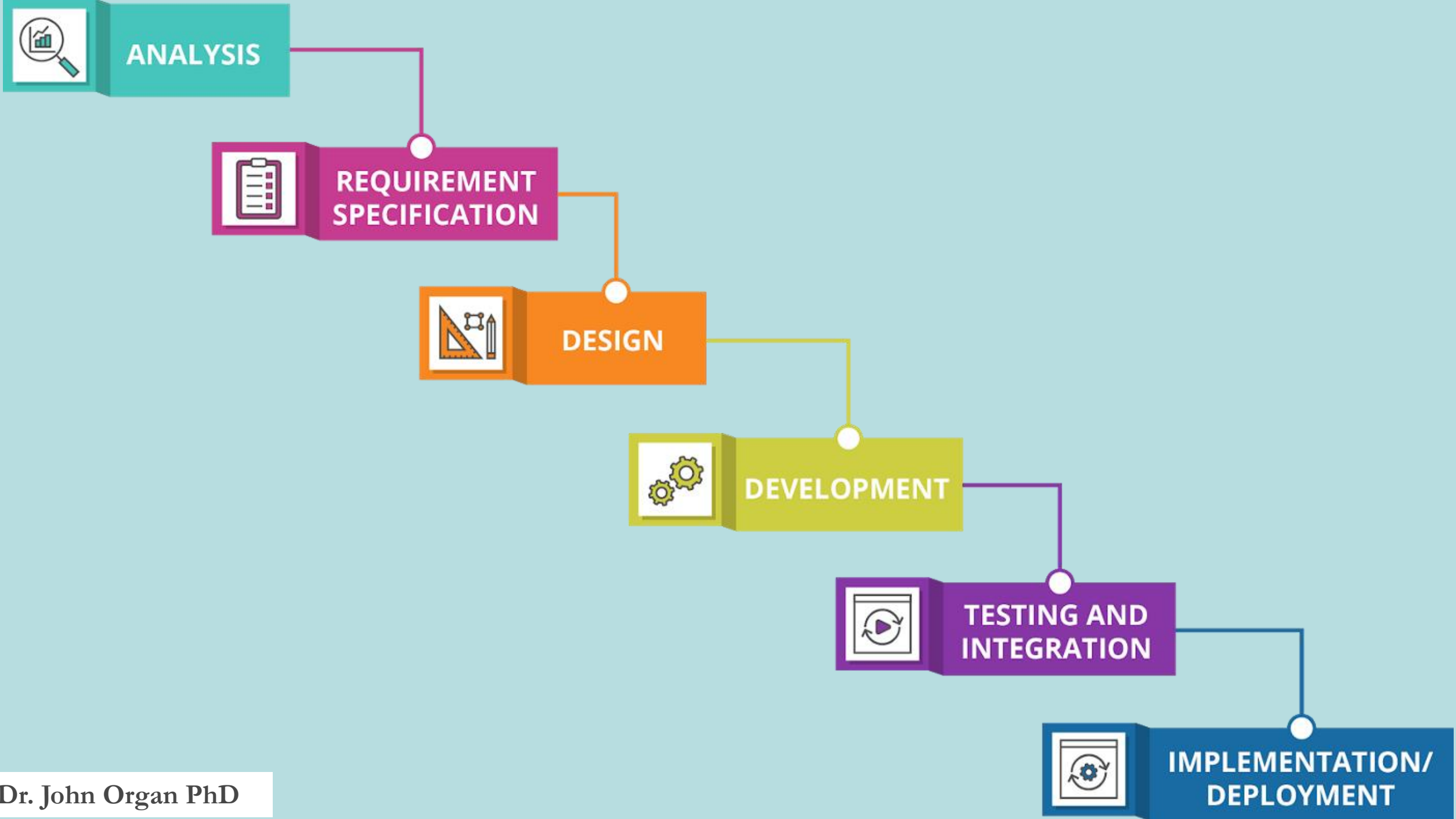
- + In this phase of systems development, the analyst helps implement the information system.
- + Training the users to handle the system.
- + Vendors do some training, but oversight of training is the responsibility of the systems analyst.
- + The analyst needs to plan for the smooth conversion from the old system to the new one.
- + This process includes converting files from old formats to new ones or building a database, installing equipment, and bringing the new system into production.

# Waterfall Method

- + First published model of software development/information systems.
- + Offered the means of making the development process more structured.
- + Stages cascade from one stage to another.
- + In the original waterfall model, a strict sequentially was at least implied.
- + This meant that one phase had to be completed before the next phase was begun.



- + It also did not provide for feedback between phases or for updating/re-definition of earlier phases.
- + Implies that there are definite breaks between phases. i.e. that each phase has a strict, non-overlapping start and finish and is carried out sequentially.
- + Critical point is that no phase is complete until the documentation and or other products associated with the phase are completed.



# Waterfall Problems

- + Real projects rarely follow the sequential flow that the model proposed.  
Iteration always occurs and creates problems in the application of a paradigm.
- + It is often difficult for the customer to state all requirement explicitly.  
The classic life cycle requires this and has difficulty accommodating the natural uncertainty that exists at the beginning of many projects.
- + The customer must have patience  
A working version of the program(s) will not be available until late in the project timespan.  
A major blunder if undetected until the working program is reviewed, can be disastrous.

# Agile Approach

- + Methodology i.e. system of principles rather than a particular model or paradigm
- + The agile approach is a software development approach based on
  - Values
  - Principles
  - Core practices

# Agile Approach - Values

- + Individuals and interactions over processes and tools
- + Working software over comprehensive documentation
- + Customer collaboration over contract negotiation
- + Responding to change over following a plan

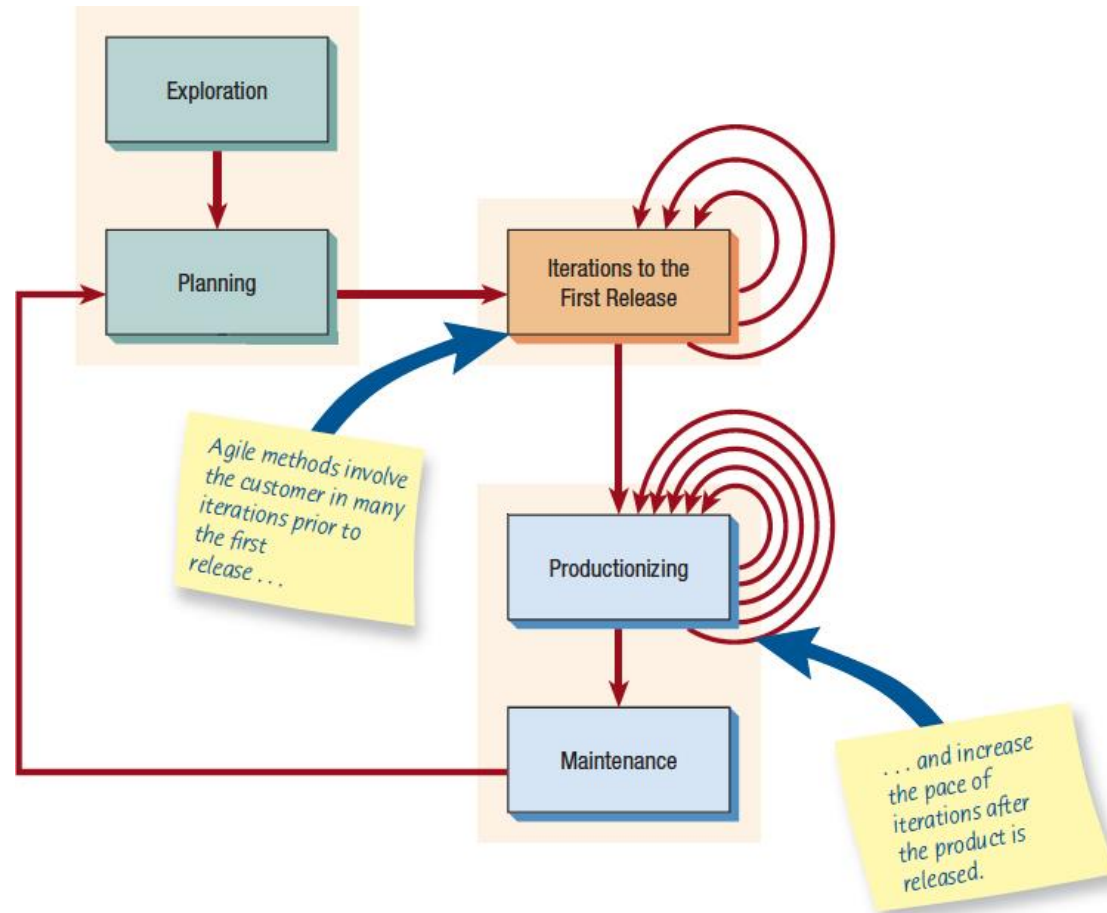


## + Focus

- Keeping code simple,
- Testing often,
- Delivering functional bits of the application as soon as they're ready.

## + Goal

- Build upon small client approved parts as the project progresses, as apposed to delivering one large application at the end of the project



# Exploration

- + Assemble team
- + Assess skills
- + Examine potential technologies
- + Experiment with writing user stories
- + Adopt a playful and curious attitude toward the work environment, its problems, technologies, and people

# Planning

- + Rules that can help formulate the agile development team's relationship with their business customers
- + Maximize the value of the system produced by the agile team
- + Main players are the development team and the business customer

# Planning in Agile – Game Metaphor

- + In a game we talk about we talk about the **goal** of the game, the **strategy**, the **pieces to move**, and **players involved**.
- + The goal is to maximise the value of the system produced by the agile team.
- + The value arrived at, you deduct costs of development, time, expense, uncertainty so that the project can move forward





# Iterations to First Release

- + Iterations are cycles of  
Testing  
Feedback  
Change
- + One goal is to run customer-written function tests at the end of each iteration

# Productionizing

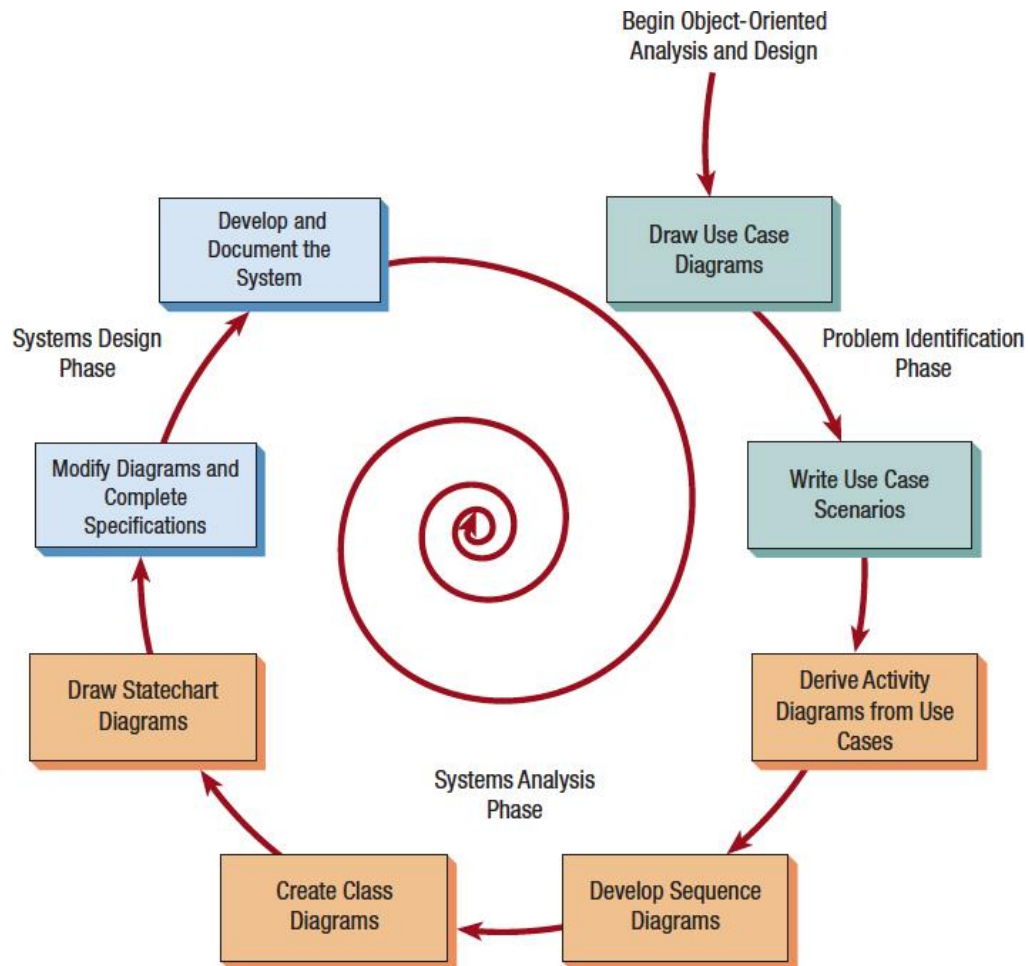
- + The product is released in this phase
- + May be improved by adding other features

# Maintenance

- + New features may be added
- + Riskier customer suggestions may be considered
- + Team members may be rotated on or off the team

# Object-Oriented Systems Analysis and Design

- + Alternate approach to the structured approach of the S D L C that is intended to facilitate the development of systems that must change rapidly in response to dynamic business environments
- + Use unified modeling language (U M L) to model object-oriented systems
- + Each object is a computer representation of some actual thing or event



**You will study this more in detail later in the module**



Choose	When
<b>The Systems Development Life Cycle (SDLC) Approach</b>	<p>systems have been developed and documented using SDLC</p> <p>it is important to document each step of the way</p> <p>upper-level management feels more comfortable or safe using SDLC</p> <p>there are adequate resources and time to complete the full SDLC</p> <p>communication of how new systems work is important</p>
<b>Agile Methodologies</b>	<p>there is a project champion of agile methods in the organization</p> <p>applications need to be developed quickly in response to a dynamic environment</p> <p>a rescue takes place (the system failed and there is no time to figure out what went wrong)</p> <p>the customer is satisfied with incremental improvements</p> <p>executives and analysts agree with the principles of agile methodologies</p>
<b>Object-Oriented Methodologies</b>	<p>the problems modeled lend themselves to classes</p> <p>an organization supports the UML learning</p> <p>systems can be added gradually, one subsystem at a time</p> <p>reuse of previously written software is a possibility</p> <p>it is acceptable to tackle the difficult problems first</p>

**These are not the only types of techniques for software and systems development e.g. prototyping, open source**