

## Highlights

- Overview of the PC's and Ranges in Unit 5
- Overview of Unit Elements
- Suggested Text Book

## Inside

- Investigate principles of SA and specification
- Undertake a Systems Analysis
- Produce a system specification

# The Systems Analysis

LECTURE

**SA LEC 01**

*Bolger & Slaters  
Systems  
Analysis  
Course Notes  
Issue 1*

# SA

## The Systems Analysis Unit

*A guide to GNVQ Advanced Mandatory Unit 5*

Mandatory Unit 5 (Systems Analysis) covers the principals of systems analysis and specification, and is designed to develop the students skills in undertaking systems analysis and producing systems specifications.

The unit comprises of three elements of competence

- 5.1 Investigate principles of Systems Analysis and Specification
- 5.2 Undertake a Systems Analysis
- 5.3 Produce a System Specification.

### Element 5.1

Element 5.1 requires students to investigate processing activities and the IT methods

used to implement them, the user information needed to initiate a feasibility study, the stages of systems analysis, analysis of documentation and the elements of the system specification.

### Element 5.2

Element 5.2 requires students to produce a systems analysis report and a data flow diagram, and show that they have established the purpose of any new system, investigated and recorded information and reviewed the systems analysis in the light of feedback from users.

### Element 5.3

Element 5.3 requires students to produce a system specification including a refined

data flow diagram, data definitions, entity relationship diagrams, data dictionary, process specification, input specification, output specification and an identification of resource implications.

The information required for this unit is covered occasionally in course notes but more importantly in pages 247-301 inclusive in the recommended course text, which is

**'GNVQ Advanced Information Technology'**  
**by Hodson and Watkins**  
**Published by DP publications**  
**Ltd, Aldine Place, London, W12**  
**8AW.**  
**ISBN 1-85805-111-8**

**Element 5.1 - Investigate principles of Systems Analysis and Specification**

**Performance Criteria**

A student must:

1. Describe processing activities and information technology methods used to implement them
2. Describe the user information needed to initiate a feasibility study
3. Explain the Stages of Systems Analysis
4. Describe the Analysis Documentation
5. Describe the elements of a System specification

**Range**

**Processing Activities:**

- manipulation (sorting, selecting, merging)
- calculation
- interrogation

- repetition

**Information technology methods:**

- programming languages
- Application software facilities (Application Generators, macros, report generator, data capture)

**User information:**

- purpose
- description of present system (input, processing, output)
- expectations of new system
- constraints (time, scale, costs)

**Stages of Systems Analysis:**

- Feasibility
- Problem statement
- Investigation
- Recording
- Analysis

- Reporting

**Analysis Documentation:**

- System Flow Charts
- Data Flow Diagrams
- Data Model (Entity Relationship Diagrams, Data Dictionary)
- Process Specification (structured English, Structure Diagram, Decision Tables, Flow Chart)

**Elements of a System Specification:**

- Data model in first normal form
- Input Specification (capture methods, screens)
- Output specification (Screens, printed report)
- process specification
- resources (hardware, software, people)
- constraints

**Amplification of unfamiliar jargon & terms found in the Performance criteria and Range statements**

**Feasibility (referred to in PC3 range)**

A brief study to determine whether it is possible to implement a new (computerised) system and to what extent a full analysis and design may be beneficial

**Investigation (referred to in PC3 range)**

This might include the acquisition of information about the data, data sources, methods of collecting

data, the people involved, the organisation, organisational functions, the processing, the outputs required, resources used, costs involved, and the constraints which exist

**Analysis Documentation (referred to in PC4 )**

This documentation is used repeatedly in systems analysis, at different levels in the system. For

example, high level flow diagrams describe the flow of information in an organisation, while more detailed data flow diagrams are used to outline the data flow in a computer system.

**First Normal Form (referred to in PC5)**

The simplest form of normalisation which involves the analysis of the entities to ensure that each

attribute (data element) represents only one item of data and that no repeating attributes occur. The

removal of repeating attributes is achieved by the creation of a new entity.

**Element 5.2- Undertake a Systems Analysis**

**Performance Criteria**

A student must:

1. Establish **purpose** of new system
2. Investigate and record **information**
3. Produce data flow diagram
4. Produce **Systems Analysis Report**
5. Review Systems Analysis in light of feedback from user

**Range**

**Purpose:**

- improve quality
- increase speed of processing
- reduce costs
- improve efficiency

**Information:**

- flow of information
- types of data
- sources of data
- data collection methods
- documents used

- personnel
- operations
- decisions
- processing
- storage
- type of output

**Systems Analysis Report**

- Feasibility Study
- Problem Statement
- Analysis (Data Flow Diagram, resources, costs, constraints, expectation of new system).

**Amplification of unfamiliar jargon & terms found in the Performance criteria and Range statements**

**System (referred to in PC1)**

It is suggested that students study traditional data processing systems. The chosen system should provide opportunities to record details about the old system and its operation, as well as the expectations of the new system. Ideally it will be a manual system processing the traditional form of data in business operations. This type of data processing involves entities such as orders, loans, invoices, customers, goods, reservations and stock.

**Investigate (referred to in PC2)**

e.g. interview, questionnaire, document, inspection, observation

**Data Collection Methods**

(referred to in PC2 range)

e.g. post, telephone, documents, electronic data capture.

**Documents used (referred to in PC2 range)**

e.g. order, delivery notes, letters, invoices

**Operations (referred to in PC2 range)**

Refers to operations such as writing, copy checking, information in a catalogue, calculating total costs, delivering, corresponding, and maintaining records.

**Decisions (referred to in PC2 range)**

Exact details of decisions taken for example IF total invoice cost more than some amount then delivery charge = ZERO.

**Storage (referred to in PC2 range)**

For example, filing cabinet, account book, card file.

**Data Flow Diagram (referred to in PC3)**

A data flow diagram of the existing system is required; diagrams of the proposed system may be produced but are not required as evidence.

**Element 5.3- Produce a system specification**

**Performance Criteria**

A student must:

1. refine the data flow diagram to produce **data definitions**
2. Produce **Process Specification**
3. Produce **Input Specification**
4. Produce **Output specification**
5. Identify **Resource implications**

**Range**

**Data Definitions**

- Entity Relationship diagram in first normal form
- Data Dictionary

**Process Specification**

- Structured English
- Structure Diagram
- Decision Tables
- Flow Chart

**Input Specification**

- data source
- data capture methods

- screen layout,
- validation,
- verification

**Output Specification**

- Screen Reports
- Printed Reports

**Resource Implications**

- Hardware
- Software
- People
- Constraints (time scale, costs)

**Amplification of unfamiliar jargon & terms found in the Performance criteria and Range statements**

**System Specification (Element Title)**

Comprises the data and information required to enable analysts and programmers to design and produce a system, which meets user requirements. The specification may comprise some or all of the following; data definition-model, process specifications, input specifications, output specifications, resource requirements.

**Data Dictionary (referred to in PC1 range)**

A list of all the data attributes (data items) which are part of the system. The list would normally indicate name of data item, data item type, data item size, description of data item, entity in which it occurs, names of entities, description of entities

**Process Specification (referred to in PC2 )**

Refers to the various techniques used to define each process in the data flow diagram, they must still be defined with a process definition. Decisions should be accompanied by decision tables. An overall structure diagram is usually produced together with structured English descriptions of each sub-routine

**Data Source (referred to in PC3 range)**

For example, documents, aural information, questionnaire, electronic files

**Data capture methods (referred to in PC3 range)**

For example, keyboard, bar code, magnetic strip, MICR, OCR, OMR, concept keyboard, digitiser, mouse

**Validation (referred to in PC3 range)**

The ways in which the system rejects data entry which it identifies as unacceptable, e.g. entry of a number when a name is required..

**Verification (referred to in PC3 range)**

The ways in which the system represents data to an operator to give them an opportunity to confirm that it is acceptable.

**Report (referred to in PC4 range)**

The production of output from software such as a database or for a specific purpose such as a telephone list, a list of orders, an invoice or a statement of account

