CHAPTER III
SYSTEMS APPROACH TO MULTIMEDIA INSTRUCTION

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3.1 INTRODUCTION:

This chapter is devoted to the use of systems approach for the development of multimedia instructional system. The chapter covers stages and steps that can be used in the multimedia instructional system development. It provides useful background necessary for the present study.

3.2 MULTIMEDIA INSTRUCTIONAL SYSTEM:

An instructional system is defined, as an integrated set of methods, media, equipment and personnel performing efficiently, the functions required for accomplishing one or more instructional objectives. The term Multimedia refers to the integration of multiple media – such as visual imagery, text, video, sound and animation – which together can multiply the impact of message. Multimedia Instructional System is an instructional system developed through multimedia technology.

3.3 SYSTEMS APPROACH TO MULTIMEDIA INSTRUCTION:

Systems approach to multimedia instruction helps in understanding, controlling and improving the structure and functioning of the system in view of effective realization of instructional objectives. It helps in providing best possible solution to the related to planning, process and product of instruction.

There are three major steps involved in system approach to multimedia instruction. They are-

1. **System Analysis:** The step is concerned with the task of analyzing a present system of instruction in the form of identifying its elements, their organization, the functions of these elements in order to make adjustment to ensure the achievement of system.

2. **System design and development:** This step is related with the task of synthesizing. Here attempts are made of design and develops the system on the basis of the findings in the first step. Objectives of the system are determined, appropriate devices, methods, strategies and
approaches are selected. System is developed considering its parameters and stipulated objectives.

3 Systems approach and evaluation: The multimedia instructional system developed in second step is put in actual operation and its evaluation is made in terms of objectives for providing necessary feedback to bring desirable improvement and modification.

The details regarding stages and steps in multimedia instructional system development are discussed in the next paragraphs.

3.4 STAGES AND STEPS IN DEVELOPMENT OF MULTIMEDIA INSTRUCTIONAL SYSTEM:

The stages and steps in the development of a multimedia instructional system are explained in following paragraphs.

3.4.1 Board Phases of Development: The development process includes five broad phases as –

1. Define
2. Pre – production
3. Production
4. Post – production
5. Delivery

In the first phase the multimedia application concept, goals and objectives, are defined in clear terms. Funds, co-operation of building team, support of multimedia architect are also clarified.

The second phase is pre – production phase. Once the multimedia application concepts, goals and objectives are clearly stated and financing is secured the pre – production phase is initiated. Budget is decided, specialist and equipment needed are identified, planning is completed, logical flow charts – scripts, storyboards and schedules are finalized.

In the third phase actual production of multimedia elements is initiated. 2-D, 3-D graphs, sound, animations videos are produced and by using authoring programme, system is developed.

In post – production phase, the multimedia is tested and revised until it enters the packaging stage.
The final phase is the delivery of the product if it is produced on large scale and for commercial purpose.

3.4.2 Simplified flow chart: A simplified flow chart of multimedia development procedure is shown in the following figure.

A simplified flowchart of multimedia development procedure is shown in Fig.1.

![Simplified Multimedia Development Process Flow Chart]

Fig 3.1: A SIMPLIFIED MULTIMEDIA DEVELOPMENT PROCESS FLOW CHART

The process includes:

1) Concept Definition: The clarification, content analysis, program script of the thing that is to be developed through multimedia technology means concept definition.

2) Story Board: The storyboard is a graphic representation of the proposed multimedia project. It is an extension of the ideas presented in the script.

3) Multimedia Blocks: The multimedia application includes multimedia blocks such as Graphic, Text, Video and Sound. The multimedia architect is responsible for putting these components together as a multimedia application.
4) **Authoring:** Multimedia authoring software is a program used to develop all types of multimedia building blocks, import and integrate all these elements into a comprehensive and possibly interactive application – Director 7.0 and Authorware are powerful authoring programs.

5) **Testing and Revision:** It is a process of evaluation, which helps testing, and revising the system.

3.4.3 *Detailed flow charts of building multimedia blocks:*

The detailed flow charts of building graphics, sound, video in planning process are shown below.

A flow chart of translating program goals into a multimedia storyboard is as follows.

![Flow chart](image)

**Fig 3.2 : TRANSLATING PROGRAM GOALS INTO A MULTIMEDIA STORYBOARD.**

To start the authoring process without planning all components of the project is major mistake. Hence, during the pre-production goals and objectives are defined. Then develop the outline and translate the outline into a flow charts. Storyboards are developed for the application. The researcher worked for the same purpose.
A flow chart of development of graphics, photos and images is shown below.

Fig 3.3: DEVELOPMENT OF GRAPHICS, PHOTOS AND IMAGES.

The figure 3.3 summarizes the roles of the multimedia development team members in selecting, identifying, producing, and integrating graphics into the authoring program.

Researcher identified and selected graphic elements to be used in the multimedia application. The graphic elements come from a multitude of sources. Once the graphic elements are created, digitized, or edited by the computer graphic artist, the multimedia authoring specialist integrated them into the authoring application.
A flow chart of sound development in multimedia planning process is as-

![Flow Chart](image)

Fig 3.4: SOUND IN THE MULTIMEDIA PLANNING PROCESS.

Fig 3.4 shows stages in sound in the multimedia planning process. In this process researcher selected narration text and music for the storyboard design purpose. Then he recorded sound and processed it for development of multimedia building block. After this step he authorised incorporate sound. Again he re-recorded sound in testing and revision step.
A flow chart of video development in multimedia planning process is shown below.

Fig 3.5: VIDEO IN THE MULTIMEDIA PLANNING PROCESS.

Fig 3.5 shows stages of video in the multimedia planning process. In this process researcher selected topic to be videotaped for the storyboard design purpose. Then he recorded video and processed it for development of multimedia building block. After this step he authorised incorporate video. Again he re-shot video in testing and revision step.
The building blocks are then integrated to compose the application as shown in the following flow chart.

Fig 3.6: INTEGRATION OF BUILDING BLOCKS TO COMPOSE THE APPLICATION.

Multimedia authoring requires developing all the multimedia building blocks that is text, audio, graphics, animations and video. Then these elements are integrated into a comprehensive and possibly interactive application. The tools of the multimedia professional are the authoring software that is Director 7.
3.4.4 A step by step process of development:

![Diagram of a step-by-step development process of multimedia system]

3.5 THE EVALUATION AND REVISION PROCESS USED IN MULTIMEDIA PRODUCTION:

The Process of evaluating/testing and revising a multimedia application project is dynamic and constant. The project evaluation is divided into internal and external evaluation.

3.5.1 Internal Evaluation: The internal evaluation of a multimedia application, by definition and nature, happens within the multimedia development group. This process is then supported and implemented by the team members. Among the aspects involved in the internal evaluation process are the following:

- Application Design - is it logical? Has it taken into consideration the psychology of learning?
Project goals and objectives – are the goals and objectives being met according to the evaluation of the development team members?

Content – is the acquired content accurate? and is it represented accurately in the multimedia application?

Text and narrations – are the text and narrations grammatically correct?

Sound – are the sound (music, special effects, and so on) well recorded?

Delivery – can the application be delivered via the proposed medium?

3.5.2 External Evaluation: By definition, this component of the evaluation process takes the application outside the walls of the facilities of the production team. The external evaluation is divided into several different components of stages. The external evaluation stages or the components are as follows:

- The Alpha testing
- Focus group testing
- The client evaluation
- The Beta testing
- The Gold version stage

3.5.3 The Alpha testing: The Alpha testing takes place when the project is considered a working model. This means, though it is not finished, it is functional, and provides a clear idea of the way the final product will look or function. Since the product to be evaluated is still in the development stage, it still has a number of bugs. The purpose of the Alpha testing is to determine if the general direction and structure are adequate and what changes are necessary.

3.5.4 The Beta testing: Once the project is in a final draft form, copies are made available to a group of potential users called a beta testing group. Beta testing provides extremely valuable feedback about the application.
After testing stages, the production researcher and the multimedia architect discuss on the merits of each of the comments and suggestion offered by evaluating group. Based on these comments, the application is revised. The revision sequence is presented in following flow chart.

![Flow Chart]

**Fig 3.8: MULTIMEDIA APPLICATION REVISION SEQUENCE.**

### 3.6 CONCLUDING REMARKS:

Successful development of multimedia-based communication requires careful planning, mastery of multimedia technology, as well as comprehensive and effective production management. It is the result of the integrated work of a team.

The technique of systems approach to instruction is most scientific way to solve the problems in instruction. It can be modified and improved in light of the evaluation of the outputs and outcomes in relation to inputs, process, environment and objectives. The researcher in his present study followed the development procedure as explained in the above paragraphs with slight changes. The detailed description of his development and the research procedure used is elaborated in the next chapter.
CHAPTER IV
DEVELOPMENT OF MULTIMEDIA INSTRUCTIONAL SYSTEM AND RESEARCH PROCEDURE