UNIT 2 INPUT DESIGN AND CONTROL

Structure

2.0 INTRODUCTION

Once the analysis and design of the system has been done, it would be necessary to identify the data that are required to be processed to produce the outputs, Input is one of the most expensive phases of the operation of a computerised system and creates sometimes a major problem. Different type of problems *with* a system can usually be traced back to faulty input design method. Needless to say, therefore, that the input data are the lifeblood of a system and have to be analysed and designed with utmost care and consideration. Input design features can ensure the reliability of the system and generate correct reports from the accurate data. The input design also determines whether the user can interact efficiently with the system.

2.1 OBJECTIVES

After studying this unit, you should be able to understand the fallowing:
- Importance of input design for producing the correct report.

- Criteria for selecting the most appropriate input method and medium for an application.
- Development of a system for validating input to a computer application.
- Preparing layout for terminal screens.

2.2 PROCESSING TRANSACTION DATA

Transaction System:

The transaction processing system keeps records of routine business activities, follows standard operating procedures, and does not require complex decision making. These systems also depend on accurate and detailed data and must be able to process large volumes of data in short periods of time. Examples of transaction system are accounting, inventory, sales-order entry, banking and airline reservation systems. All of these applications follow a transaction - processing cycle, which begins by entering the data, continues by processing the data, and concludes by presenting the output. Data can be entered into a computer system in many ways. At a bank, customers can enter their transaction through an automatic teller terminal. At a super market, prices may be read by an optical scanning device. At a travel agency, airline reservation are entered through a terminal. Regardless of the method used, the data must be entered accurately as well as efficiently. Once the data have been entered into a transaction system, it must be processed. Mainly there are two ways of processing the data. One is batch processing and other method in on-line processing.

2.2.1 Batch Processing

In the batch processing the data are collected for a given period of time, and the resulting "batch" of data is processed as a single job. Batch processing is useful when most of the records in a large database must be processed at the same time.

Many organizations also use batch processing methods for billing. Telephone, gas, electric, and cable TV companies, for example, prepare their bills using batch processing. Even Payroll—whether processed weekly, or monthly—is almost handled through batch processing.

2.2.2 On-Line Processing

Although batch processing is still used for some applications, today an increasing number of companies choose on-line transaction-precessing systems. On-line systems can reduce data-processing costs, offer better customers service, and provide a strategic advantage over competitors.

In on-line systems, data are processed instantly by the CPU. As a result, whenever a user wishes to enter or access data, the request is accommodated within a few seconds. Unlike batch processing, each request is processed individually - there is no waiting while groups of requests are batched and processed together. On-line systems are thus, preferred when selected records must be processed at any single point of time or when the user and computer system must interact.

Because on-line transaction-prbcessing systems can access data instantly and because many transaction systems must accommodate large volumes of data, larger systems generally include several disk drives with capacities of several billion bytes of data. Tapes and optical storage, if used at all, serve as a backup medium, storing additional copies of the data in the event that those stored on disk are lost or damaged.

But an OLTP (ON-LINE TRANSACTION PROCESSING) system that brings data within instantaneous reach can also, if it breaks down, brings many of an organization's activities to a screening halt. Imagine the consequences of the failure in a bank deposit system. Not only would it be difficult, if not impossible, to continue serving customers, but the cost to the bank for even a few hours of service interruption could be very high. Because many organizations have become so dependent on OLTP systems and because failures can be dramatically disruptive, some firms have chosen to purchase fault-tolerant computer systems. These systems use additional hardware and software to help avoid a system failure. One key ingredient is the use of disk mirroring, a scheme in which the system maintains a mirror image of critical disk data on two physical separated disk drives. Whenever data are entered into the system, they are automatically entered into both devices, in the event of a disk

failure, the system will automatically retrieve the data from the working disk. In addition, fault-tolerant computer systems can through hardware and software, circumvent portions of the hardware if the electronic circuitry breaks down. Two other important characteristics of an OLTP are its multi-user and multi-tasking capabilities. A multi-user, OLTP serves many users, each executing a different JOB, at what appears to be the same time. For example, it allows several people to sit at terminal scattered throughout an organization and work on problems that may be totally unrelated to one another. One user may be entering accounts receivables transactions, another may be entering accounts payables; and a third may be producing an inventory report. Each user has the impression that no one else is using the system, thanks to complex on-line operating system software that keeps the separate uses of the system disentangled.

2.3 ELEMENTS OF INPUT DATA

Inaccurate input data are the most common cause of errors in data processing. Errors entered by data entry operators can be controlled by input design. Input data are collected and organized into groups of similar data. Once identified, appropriate input media are selected for processing.

2.3.1 Input Data

The goal of designing input data is to make data entry as easy, logical and error free from errors as possible. In entering data, operators need to know the following:

- The allocated space for each field.
- Field sequence, which must match that in the source document.
- The format in which data fields are entered; for example, filling out the date field is required through the edited format mm/dd/yy.

When we approach input data design, we design the source documents that capture the data and then select the media used to enter them into the computer. Let us elaborate on each step.

2.3.2 Source Documents

Source data are captured initially on original paper or a source document. For example, a cheque written against an account is a source document When it reaches the bank, it is encoded with special magnetic ink character recognition (MICR) so that it can be processed by a reader that is part of the information system of the bank. Therefore, source documents initiate a processing cycle as soon as they are entered into the system. Source documents may be entered into the system from punch cards, from diskettes, or even directly through the keyboard. A source document may or may not be retained in the proposed system. Thus, each source document may be evaluated in terms of:

- its continued use in the proposed system,
- the extent of modification for the proposed system &
- replacement by an alternative source document.

A source document should be logical and easy to understand. Each area in the form should be clearly identified and should specify for the user what to write and where to write it For example, a field as simple as date of birth may be written in four different ways:

- 5 December, 1994
- Dec. 5 1994
- 12/5/94
- 5/12/94 (European style)

Unless it is clear in a source document that two digits are allowed for the month, day, and year (MM/DD/YY), we could expect such combinations of responses.

2.4 INPUT MEDIA AND DEVICES

Source data are input into the system in a variety of ways. The following media and devices

are suitable for operation:

a) Punch cards are either 80 or 96 columns wide. Data are arranged in a sequential and logical order,Operators use a keypunch to copy data from source documents onto cards. This means that the source document and card design must be considered simultaneously.

b) Key-to-diskette is modeled after the keypunch process. A diskette replaces the card and stores upto 325000 characters of data - equivalent to the data stored in 4050 punch cards. Like cards, data on diskettes are stored in sequence and in batches. The approach to source document and diskette design is similar to that of the punch card. Data must be in sequence and logically cohesive.

c) MICR translates the special fonts printed in magnetic ink on checks into direct computer .input,

d) Mark-sensing readers automatically convert pencil marks in predetermined locations on a card to punched holes on the same card.

e) Optical character recognition (OCR) readers are similar to MICR readers, except that they recognize pencil, ink or characters by their configuration (shape) rather than their magnetic pattern. They are often used in remote locations as free-standing input preparation devices or direct input media to the system.

f) Optical bar code readers detect combination of marks that represent data. The most widely known system is the Universal Product Code (UPC), which codes retail items in stores. Automatic tag reading is a major breakthrough in speeding up customer service and eliminating costly data input errors at the point of sale. It is virtually impossible for the sale clerk to enter incorrect merchandise information such as department and class type data. Automatic tag reading is the ideal way to collect unit inventory information fast, accurately and economically.

g) Cathode-ray tube (CRT) screens are used for on-line data entry. CRT screen generally display 80 characters simultaneously on a television-like screen. They show as many as 24 lines of data.

In addition to determining record media, the analyst must decide on the method of input and the speed of capturing and entering the data into the system. Processing may be batched (a group of records handled as a unit), on-line (records processed directly), sequential (sorted records), or random (unsorted). For example, magnetic tape may be suitable for batch sequential processing, whereas diskettes are ideal for on line processing and random inquiries.

2.5 INPUT DESIGN GUIDELINES

The design of input play very significant role in getting the correct output. It covers all phases of input from creation of initial data (original recording) to actual entering the data to the system for processing. The input design is the link that ties the information system into the world of its users. Some features of design may vary depending on whether the system is batch-oriented or on-line. Here; we will discuss thd various objectives of input design. They focus on:

- Controlling amount of input
- Avoiding delay .
- Avoiding errors in data
- Avoiding extra steps
- Keeping the process simple

Each of the five objectives of input &sign is briefly discussed below:

2.5.1 Controlling Amount of Data

An effective design controls the quantity of data for input for the following reasons:

Firstly, data preparation and data entry operations depend on people. Since labor costs are

high, the cost or preparing and entering data is also high. It is quite evidcnl, then, that reducing data requirements mean lowering costs through reduced labor expense. Secondly, the input phase of computing can be a slow process and take many times longer than that needed by computers to carry out their tasks. In fact, the computer itself may sit idle until data is prepared and input for processing. By reducing input requirements, the analyst will speed the entire process from data capture to processing to provide results to users.

2.5.2 Avoiding Delay

When processing is delayed owing to data preparation or data entry, the cause is called a bottleneck. Avoid bottlenecks when designing input should always be one of the objectiveof the analyst.

2.5.3 Avoiding Errors in Data

The third objective deals with errors. In one sense, the rate at which errors occur is dependent on the quantity of data. Since the lower the amount of data is inputted, there are fewer opportunities for the error to occur.

Firstly, the analyst can reduce this number by reducing the volume of data that must be entered for each transaction.

Secondly, the analyst can also affect error rates of an operation through design. The manner in which data must be entered can reduce the chance of errors.

Still, a third aspect of error control is the need to detect errors when they do occur. Checks and balances in the data entry programs, called input validation techniques, also detect errors in input.

2.5.4 Avoiding Extra Steps

Sometimes the volume of transactions and the amount of data preparation or data entry jobs resulting from them cannot be controlled. For example, in bank cheque processing runs or in large retail sales firms, the number of transactions to process runs into the tens of thousands.

When the volume cannot be reduced, the analyst must be sure that the process is efficient. The experienced analyst will also avoid input designs that cause extra steps. The cflect of saving a single step when feeding details of cheque into the banking process is multiplied many times over in the course of a working day. So is the additions of a single step.

2.5.5 Keeping the Process Simple

Perhaps the best advice to analysts is to achieve all of the objectives mentioned in the simplest manner possible. The best- designed system fits the people who will use it in the way that is comfortable for them, and at the same time it provides the error control methods management acceptable to the users. In contrast, one will have to work to get users to accept complex or confusing input designs, and there is no guarantee he will succeed in installing and running complex system. So it is advisable to avoid complexity when then: are simple alternatives.

2.5.6 Major Concerns Regarding Input

Important points to be considered here are as follows:

- What input is needed?
- How and where is the input created?
- How should the source documents be designed?
- What format should be used for the input records?
- What medium should be used for recording the input?

We will discuss each of the major input concerns briefly:

The Inputs Needed

The input needed for any program is determined by the output desired. The analyst must ask the following questions. What information is already in the master file or database? What constant data is required that can be entered from some type of control record ? What information must be supplied by using some type ol transaction file? What data should be

stored in and accessed from tables? What information can be calculated by the program?

Any time the use of a transaction file is being considered, or the data is to be entered from a terminal, the analyst must check each field to determine whether the data is already in a master file or might be included in a table. The analyst must be concerned that all of the data required to produce that output is entered into the program in the most efficient and cost-effective manner.

How and where data is generated

How the data is generated, and where it is generated, has a direct impact on a number of other questions. In a cost- accounting system, much of the data is generated when material is put into production. The analyst should attempt to provide a reliable means of entering data directly into the system from the factory. Data collection devices or special terminals can be used to enter some of the data.

In a retail sales system, a type of scanner device - Bar Code Readers may be used to read price tickets. When charge sales are made, special readers are available that make it possible to use the data stored on the customer's charge card. Whenever possible, the manual keeping of data should be eliminated. In a retail sales application, the only variable data that a clerk might need to key in on a Point of Sale (POS) Terminal having special key for various item categories is the quantity of a given item that is purchased. For processing of electricity bills, the computer system itself first generates an input sheet containing House Number-wise table covering street to street the consumer details - Meter No., reading of Last Cycle, Type of Consumer - Domestic/Charitable Society/Govt./Business keeping the single field blank present meter reading. This input sheet facilitates the Meter Reader to enter single blank entry after verifying correctness in other columns of table.

Railways Reservation System presents an input screen simply on entering the Train code, Travel Class and Date of travel wherein if reservation is asked, the clerk has to enter passenger's details almost in same way as given by him in the reservation slip.

In large Tea Gardens of Assam spread over several kilometers, Hand held terminals in Mobile Vans are used to enter leaf Phreker's code and weight of leaf plucked on daily basis moving from one garden to another and entire data is updated returning back to Computer Centre which generates weekly payment reports for forced workers and next days schedule for labour deployment in new gardens.

Designing the source document and the Input Format

The formats for the input records and the source documents should be determined simultaneously.

The source document can be designed as soon as it is determined what data is needed and where and how it is to be entered into the system. The analyst should work with the data entry supervisor. The design of the documents should permit the personnel recording the data to do so as easily and rapidly as possible. Check boxes can be used, which reduce the time needed to fill out documents and minimize recording errors. Take the case of Electricity bills. It has two parts. The first is called 'MAIN' on which cash/cheque receiving clerk enters the amount received with details including the date and hands over to the customer as a payment made by him. The second is called 'STUB' which are bundled together on day end and sent to Computer Centre for data updation of payments received from the customers for future accounting for ease in transcribing data into a   . machine-processable form, the locations for each field with the record should be specified on the documents. Identical design of source document and related Data Entry Input screen facilitates Data Entry Operators to enter data at high speed since locations of data to be read are easily identified.

The input record should be designed so that the flow of data on it is the same as on the source document This decreases the time needed to record data and also reduces errors.

The input format must be designed concurrently with the source document. The factors that must be considered are: record length, field size, use of codes, and the relationship of the source document to the input record. When a terminal is used to make the changes or to add new customers to the file, a formatted screen should be designed that looks very much like the source document. The operator fills in the blanks and these may be used to indicate the number of characters that can be entered in much the same way the form would be filled in manually.

The analyst must understand the characteristics of the data entering the system and determine the field size that should be used. For example, if each customer is assigned a number and the firm now has 9,945 customers, the analyst should allow five positions for the field. If five positions are not reserved for the field, as soon as 54 more records are added, the field will not be large enough to handle the account number. Field sizes are usually determined by studying historical data, projecting future needs, and providing for growth.

Input Medium

An input method that requires a minimal amount of data conversion should be selected.. If punched-card recorders (keypunches), diskette recorders, key-to-key tape recorders, or terminals are used, the data is usually recorded on a source document and then transferred to the machine-processable medium (cards, diskettes, tape, disk, or directly into a transaction file). In case of process control however, these media based programs directly control the target machines.

2.6 INPUT VERIFICATION AND CONTROL

If incorrect data enters the system, it is usually very costly to make the necessary corrections. Also, how expensive would it be to have your operator record a quanlity of 100 rather than 10 for a shipment of sports cars? The shipping charges for sending the cars to the customer and then of having them returned would be only one of the costs. While the 90 extra cars were in transit, they would not be available to other customers (which could result in a loss of sales) or could be damaged. There are many methods which are commonly used to verify data entering the system as input. Some of the them are :

2.6.1 Key Verification

A second operator rekeys the data already recorded. This method is used for verifying data recorded in punched cards or on diskettes and magnetic tape. Then two floppies are compared to correct record by record which mismatched during comparison after verifying, from the original documents. This is most effective method used by Computer Service bureaus for data validation.

2.6.2 Use of Self-checking Numbers

The computer can be programmed to reject numbers that have been transposed or have one or more wrong digits. Check digits and self-checking number routines can be effectively used for numbers in a series, such as student roll numbers, account numbers, part numbers, or invoice numbers are popular for such jobs.

2.6.3 Visually Displaying an Identifying Characteristics

When using a terminal, a part number is entered. Displayed in the VDT is the description of the part, which is then visually confirmed by the operator,

2.6.4 Hash Totals

Sometimes numbers are added to produce a meaningless total called a hash total. For example, totaling is made of the quantity of all items purchased. When the records are entered and processed, the hash total is compared to the original total. If the two totals agree; it is an indication that all quantities were entered correctly and all records were processed.

2.6.5 Checking Between a Range of Numbers

The numbers on the orders being processed on a given day should fall between, say, 4999 (the last number from the previous day) and 6001 (the next order number that will be on all of the orders processed by the next day). If the order number recorded on the input record does not fall within that range, an error message will be generated.

2.6.6 Reasonableness Test

Based upon past history, some input can be checked to see if it is reasonable. For example, because of long-standing company policy, it is unlikely that any employee will have more than 20 hours of overtime. If more than 20 hours of overtime are recorded in an employee's current transaction record, an error message will be generated as the data is being edited.

'Similarly in 'Date of Birth' field, it is checked that no date is more than 31, month number is not more than 12 and the year is not more than the current year or current year minus minimum age prescribed.

2.6.7 Verification of Codes

The pay and fringe benefits are calculated for employees based upon their payroll status. Assuming that the valid status code must be either an H (hourly), S (salaried), T (trainee), or a P @art-time), an error message would be generated if the code used was not an H, S, T, or P.

2.6.8 Verification of Data Type

Some input fields should contain only numeric data while others should contain only alphabetic data. The fields can be edited to make certain that only the right type of data is recorded in each field.

2.6.9 Verification That Certain Combinations of Data Exist

For example, all students may be coded with either a W or a V. The V denotes a non-work-study student while the W indicates that the student is on work-study. The only valid account, numbers for a work-study student are 2155 and 2156. Any other account number for a W-coded student is invalid.

2.6.10 Sequence Cheek

If the numbers in the source documents are serial and the documents are in order, the input records will also be in numerical sequence. A check can be made by the program to determine whether the records are in either ascending or descending order.

Check Your Progress 1

1. List out various input devices for feeding the raw data into the system.

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2. Explain briefly the objectives of input design.

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3. List out the various methods commonly used for input verification and control.

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2.7 DATA DICTIONARIES

Data dictionary stores description of data items and structures as well as systems processes. It is intended to be used to understand the system by analyst who retrieves the details and descriptions it stores. He takes the help of data dictionary during system design, when information about such concerns as data length. alternate names (aliases) and data use in particular processes must be available. The data dictionaries have also validation information in storage to help the analysts in specifying controls for the system's acceptance of data. The dictionary also contains definitions of data flows, data stores and processes. Data dictionaries can be developed manually or using automated systems. Automated systems offer the advantage of automatically producing data element, data structure and process listings. They also perform cross-reference checking and error detection. Automated dictionary systems are becoming the norm in the development of computer information systems. For further study about data dictionary, please consult unit 4 of block 1.

2.8 HOW TO LAYOUT TERMINAL SCREEN

Software is available that make it easy to layout screens. The programmer keys in the required format on the screen, gives the format a name and then stores the format in a file. Whenever the format is to be used as a display in a program, it can be called into the program by using its name. A programmer can also create display screens within a program.

2.8.1 Designing of CRT- Input Display Screen

Special considerations are needed for input designs in on-line environments. The analyst must design CRT screens that tell the user what to do and what steps to take next in a way that is brief, yet easy to understand, Menus are often used to presenl options to users and data fields are marked to show their length while telling the user where to enter the data. Data entry in on-line systems also includes the ability to edit data. In each of these cases, valid entries must be identified and communicated to programmers so that they develop the software to accept correct entries and reject those that are invalid.

2.8.2 Basic Rules for CRT-Input Display Screens

There are a few basic rules that must be followed in displaying information on a screen. The important points to remember are:

- Clear the entire screen between formats. There is usually a "clear screen" command that can be used.

- Format the output so that it is easy to read. For example, don't clutter up the screen with unnecessary information. Always display directions or error messages in the same place on the screen, and leave space between items so that the information is easy to read.

- Prevent scrolling. Unless delays are coded into programs, information is displayed on a VDT faster than most people can read. One screen of information should be displayed at a time. When the operator is ready, a specified key is depressed and a new screen of information is displayed.

- Don't overuse color. Often monitors that display information in color are used for terminals or for microcomputers. Carefully controlled use of color can make the information more understandable; uncontrolled use of color adds confusion.

- Be consistent. For example, all instructions may be displayed at the bottom of the screen.

- Develop and use simple conventions such as having an operator enter a '1' or 'Y' for a positive response to a question or a statement.

- Make certain that all directions are clearly stated.

- Test all screens. Have someone totally unfamiliar with the program to load the program and enter the required data without using the help option before same is released commercially.

2.9 MAJOR CONCERNS REGARDING CRT— INPUT SCREEN DESIGN

Major concerns regarding CRT - input screen designs are as follows:

- Ease of use
- Improved processing speed
- Menu driven screens
- Emphasizing information on display screens
- Colour use in screen design
- Colour selection
- Editing through display screens

We will discuss each of them below:

2.9.1 Ease of Use

One of the most common approaches in designing easy-to-use CRT screen displays is the fill-in-the-blank approach. The analyst simply formats the initial input display so that all the required data elements are clearly labeled and a space is provided for data entry. The display should be aesthetically designed and all descriptions and error messages should be meaningful in clear statements. In other words, care should be taken to avoid symbols and over abbreviations.

2.9.2 Improved Processing Speed

Some of the weys to reduce data entry requirements include:

- Designing the screen display so that responses can be abbreviated(for example, entering "Y" instead of "Yes").

- Designing the screen format so that the order of data entry is consistent with the business transaction. This feature eliminates unnecessary "tabbing" around the screen.

- Designing the screen format so that data can be changed are "unprotected" and data that cannot be or should not be changed are protected.

- Using program function keys, which are available on many of the sophisticated terminals and can literally trigger a transaction when a single button is pushed,

- Using terminals that have additional application-specific features (for example, a number pad can be helpful for accounting systems, Point of Sale Terminals in Hotels, Super Bazars etc,

2.9.3 Menu Driven Screens

Since on-line systems provide several input and processing options to users, a method of showing the options the user can choose from is needed. Menus serve this purpose. A menu is a screen of information displayed on the CRT that shows the user what functions can be performed and how to select them.

Menus that provide selections to users in a top-down fashion ensure that systems are easy to use, while making the choice: of what to do next should be a simple procedure, The system leads the user through a series of decisions until the correct procedure is selected. For instance, a narrative dialogue to lead someone through the steps in editing sales budget data would probably sound something like this:

- You are using the sales system. Which function do you wish to select? (The user depresses "3" for the EDIT MENU option shown on the main menu.)

- You have selected the edit option from the main menu. Which of these editing options do you wish? (The user depresses "1" for the EDIT BUDGET option shown on the edit menu.

- You have selected the edit budget option from the edit Menus accomplish the same

thing with few words. This is why analysts and users alike prefer them to write instructions or the display of narrative information on the screen. Notice the uncluttered look of the screen, even after all headings and options are displayed. It would be difficult to preserve the easy-to-read displays if the narrative above was shown instead of the menu option.

2.9.4 Emphasizing Information on Display Screens

Often the analyst will use features built into hardware and software to call information or messages to the attention of users. For example, error messages or reports of unacceptable actions (such as submitting invalid data or asking the system to perform a function now expected by the program) are best displayed by using one of the emphasis techniques listed below, Likewise, when the user enters data for processing, the analyst may display a message informing the user the data has been accepted and processing has begun.

The methods of emphasis that many systems offer are:

— Blinking

— Underlining

— Increased/reduced light intensity

— Inverse video (black letters on light screen)

2.9.5 Colour Use in Screen Design

When large amounts of information must be presented on a display screen, the analyst may use color to provide better structure and meaning to the information. Related items can be tied together by color so the user can spot them more quickly. For instance, a report showing sales, costs, and profits for various regions may be presented using colors to show each type of cost across departments.

If properly used in the design, color will assist the user in understanding information on the screen, determining what steps are valid, and reducing errors.

Color has four primary uses: (1) identifying valid operations the user can carry out (2) typing . related data together (3) highlighting information about organisation performance and (4) communicating messages about system performance.

2.9.6 Color Selection

Color meaning are lost if they are used improperly or if excessive color is used. No more than four colors can be quickly recognized by users. The most useful colors are red, green, yellow, and blue. Contrasts are most effectively presented through the color pairs of red and green, yellow and blue, or white and blue.

Color can be effective when there is a reason for its use. However, if the analyst specifies color only for the sake of color, the impact of information may be lost through the distraction of color. Thus its utilization must be carefully planned. The relative contrast/order of legibility amongst most popular colour-ways and the background have been shown in the tabular form as given below:

Order of Legibility	Printing Colour	Background Colour
1	Black	Yellow
2	Green	White
3	Red	White
4	Blue	White
5	White	Blue
6	Black	White
7	Yellow	Black

8	White	Red
9	White	Green
10	White	Black
11	Red	Yellow
12	Green	Red
13	Red	Green

2.9.7 Editing Through Display Screens

Editing refers to any changes made to records that are stored in the system or that have been submitted for processing but have not yet been stored. Editing also includes deletion of records.

To design an edit function, you must first provide a way for users to tell the system which record of data they wish to edit. Deleting records in on-line systems requires the analyst to provide a way for the users to indicate the proper record, as well as instructing the system that the transaction is a deletion.

Two ways are common. The first allows the user to depress a key that instructs the system to delete the current record on the screen. The other way analysts build delete procedures asks the user to identify the proper record by entering the record key (such as item number) and then depressing a key telling the system to delete the record.

Both methods are common, although the first one is preferred since the user views the record before telling the system to delete the record.

Check Your Progress 2

1. What do you understand by 'Data Dictionary'?

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2. Explain briefly major concerns regarding CRT-Input screen design.

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3. What is the importance of color use in screen design?

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2.80 SUMMARY

In this unit, we have discussed the responsibilities of analysts for the design of input specifications. Various methods for capturing data and validating its accuracy have also been studied. The overall objectives of input design stress minimizing the quantity of data for input while controlling errors and delay. An effective design will also avoid extra steps in input while ensuring that the entire process is quite simple for users and data entry operators. Data dictionary and input screen design have also been discussed briefly.

2.11   MODEL ANSWERS

Check Your Progress 1

1.   Various input devices are:

   (i)   Punch card reader

   (ii) Key-to-tape, key-to-disk, key-to-diskette

   (iii) MICR

   (iv) Mark-sensing reader

   (v) OCR

   (vi) Optical bar code reader

   (vii)CRT

2.   Various objectives of input design are:

   (i)   Controlling amount of input

   (ii) Avoiding delay

   (iii) Avoiding errors in data

   (iv) Avoiding extra steps

   (v) Keeping the process simple

3.   Various methods used for input verification and control are:

   (i)   Key verification

   (ii) Use of self-checking numbers

   (iii) Hash totals

   (iv) Checking between a range of numbers

   (v) Reasonableness test

   (vi) Verification of codes

   (vii) Verification of data type

   (viii) Verification that certain combinations of data exist

   (ix) Sequence check

Check Your Progress 2

1.   Data dictionary stores description of data items and structures as well as systems processes. It is intended to be used to understand the system by analyst who retrieves' the details and descriptions it stores.

2.   Major concerns regarding CRT-input screen designs are:

   (i)   Ease of use

(ii) Improved processing speed

(iii) Menu driven screens

(iv) Emphasizing information on display screens

(v) Colour use in search design

(vi) Colour selection

(vii)Editing through display screens

3. Main uses of colow are:

(i)   Identification of valid operation properly

(ii) Typing related data together

(iii) Highlighting information about the achievements of organisation

(iv) Communicating messages about system performance