**CHAPTER I**

**INTRODUCTION**

**1.1 Introduction and History of C**

C is a general-purpose, imperative computer programming language, supporting structured programming, lexical variable scope and recursion, while a static type system prevents many unintended operations. By design, C provides constructs that map efficiently to typical machine instructions, and therefore it has found lasting use in applications that had formerly been coded in assembly language including operating systems, as well as various application software for computers ranging from supercomputers to embedded systems.

C was originally developed by Dennis Ritchie between 1969 and 1973 at Bell Labs, and used to re-implement the Unix operating system. It has since become one of the most widely used programming languages of all time, with C compilers from various vendors available for the majority of existing computer architectures and operating systems. C has been standardized by the American National Standards Institute (ANSI) since 1989 and subsequently by the International Organization for Standardization (ISO).

The C language exhibits the following characteristics:

1. **Simplicity**: C has richest collection of inbuilt functions, keywords and data types. It also resembles general English language. Also it follows a structured approach so it is to learn also.
2. **Clarity:**The keywords and library functions available in C resembles common English words thus it helps to improve the clarity of the program,
3. **Portability:** By the term portable we mean computer independent. The program made in C can be made to run on different machines thus increasing the efficiency of the program.
4. **Modularity:** The programs made in C can be easily divided into small modules with the use of functions. This feature helps to increase the understandability of the program.
5. **5. Easy Availability:** The C compilers are easily available and they require very less disk space for their storage. It is very easy to load Turbo C complier in your computer.

While C does not include some features found in some other languages, such as object orientation or garbage collection, such features can be implemented or emulated in C, often by way of external libraries (e.g., the Boehm garbage collector or the GLib Object System).

**1.2 Introduction to Database Management System**

  Data are raw facts that constitute building blocks of information. A database is a data structure that stores organized information. Most databases contain multiple tables, which may each include several different fields. For example, a company database may include tables for products, employees, and financial records. Each of these tables would have different fields that are relevant to the information stored in the table. Technically, Database is a structured set of data held in a computer, especially one that is accessible in various ways.

*(Source: techterms.com)*

A database-management system (DBMS) is a computer-software application that interacts with end-users, other applications, and the database itself to capture and analyze data. A general-purpose DBMS allows the definition, creation, querying, update, and administration of databases.

**1.3 Introduction of C-Compiler:**

A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses. Typically, a programmer writes language statements in a language such as [Pascal](https://whatis.techtarget.com/definition/Pascal) or [C](https://searchwindowsserver.techtarget.com/definition/C) one line at a time using an editor. The file that is created contains what are called the sourcestatements. The programmer then runs the appropriate language compiler, specifying the name of the file that contains the source statements.

Here we are using GNU GCC COMPILER for our project work. The GNU Compiler Collection is an open source (GPL) compiler. It's found on a wide variety of systems, ranging from GNU/Linux to every flavor of Unix, to Windows.

GCC contains support for many languages (C, C++, Fortran, to name but a few). It's highly portable, and widely used, and tends to produce good code. It can also be used as a cross-compiler (compiling for a system other than the one running GCC).

**1.4 Developing tools:**

**Code Blocks (v17.12) :**

Code Blocks is an open-source, cross-platform (Windows, Linux, MacOS), and free C/C++ IDE. It supports many compilers, such as GNU GCC (MinGW and Cygwin) and MS Visual C++. It supports interactive debugging (via GNU GDB or MS CDB). CodeBlocks is surprisingly versatile, and in my opinion, much better than the Visual Studio suite. It is designed to be very extensible and fully configurable.

For our project work we used code Blocks as a developing tool among other, since it is provided with various functions than any other developing tools. We preferred code blocks of latest version 17.12 over other versions because of its improvements in overall performance.

**CHAPTER II**

**PROJECT INTRODUCTION**

The title of this project is Student’s Record Management System And Marksheet Generator**,** which has been prepared for the partial fulfillment of BSC.CSIT first year first semester. This project has been prepared by the joint team effort of Suman Dhakal, Dipesh Dhungana, Anis Limbu, Uraj Nepal.This project mainly focuses on the systematic and digital record keeping of student’s record in school.

**2.1 Background of the Project:**

An educational institution is a place where people of different ages gain education. Examples of some institutions are preschools, primary schools, secondary schools, and further and higher education and tuition center. They provide a large variety of learning environments and learning spaces. In the present context, the number of student enrolling in educational institutions is in an increasing order. Every school should maintain various records of their students for various purposes.  
   
 The record keeping of the students should be systematic and effective so that it would be easy and secure to keep each and every record of students including names, address, attendance, phone number, marks obtained etc. Unlike ancient times, the technology and method of performing tasks nowadays are changing vastly. Due to the advancement in the field of science and technology every task is being carried out digitally by the use of various electronic digital means. So it would be better if the records of educational institutions are maintained digitally by the use of computer software developed for that specific purpose. It would be systematic and scientific in every aspects of record keeping which would also be hassle free and secure from loss of data or information in future.

For the above mentioned reasons this project is devoted for creating computer software that will have a very useful application in educational institutions such as schools for the record keeping and information management of the students. By the use of this software the teachers or related employees would be able to maintain each and every record of the students admitted in the school and be able to retrieve and manipulate those records as well. The interface of this software is user friendly which makes it easy to learn and use on a daily basis with minimal training. The records on the basis of various topics that can be can be maintained by using this software is listed below:

* Name and roll number of the students
* Address of the students
* Father’s name and contact number
* Faculty and level
* Email address

The software is also able to prepare mark sheet of the students which can show the overall performance of the students on the basis of marks obtained in different subjects, Total marks obtained, percentage ,Grade of the students etc.

**2.2 Objective of the project:**

The objective of the project are mention below:

* To reduce the paper work
* To reduce time consumption
* To increase the efficiency with decreasing the work load
* To provide computerize record management system on maintenance of student record

**2.3 Scope of the project:**

The proposed system is intended to manage specific information of students such as personal details, course details, faculty details and exam details etc. It is not student information management system which has a broader application but is only a part of student information management system and includes marksheet generator system.

**2.4 Statements of the project:**

Management student record system is the process of collecting processing and storing transmitting relecant information to suppose the management operations in any educational organizations where, it helps to provide accurate and timely information necessary to facilitate the decision making process and enable the organization and planning.

**CHAPTER III**

**SYSTEM DEVELOPMENT LIFE CYCLE**

**3.1 Introduction of SDLC:**

The systems development life cycle (SDLC) is the overall process for developing information systems from planning and analysis through implementation and maintenance. The SDLC is the foundation for all systems development methodologies and there are literally hundreds of different activities associated with each phase in the SDLC. Typical activities include determining budgets, gathering system requirements, and writing detailed user documentation. The activities performed during each systems development project will vary. The SDLC begins with a business need, followed by an assessment of the functions a system must have to satisfy the need, and ends when the benefits of the system no longer outweigh its maintenance costs. This is why it is referred to as a ‘lifecycle’. The SDLC is comprised of seven distinct phases: problem identification, analysis, design, development, testing, implementation, and maintenance. This section takes a detailed look at a few of the more common activities performed during the phases of the systems development life cycle along with common issues facing software development projects.

implementation

Problem identification

maintenance

design

testing

development

System analysis

Fig 1 : system development life cycle

**3.2 Phase I: Identifying Problems, Opportunities, & Objectives Overview**

It is the initial phase of SDLC which is related with identification of problems or opportunities and determination of objectives or goals of the project. A “problem” is anything within the business model which is not working or fulfilling its stated purpose. For instance, orders are delayed, product is not up to quality specifications, or billing is not sending correct information to buyers, record keeping inconvenience and so on.

An “opportunity” is anything within the business which improves the business model. It could be improved upon to produce a higher level of profit, reduction of expenses, higher employee morale, or even a strategic position for future expectations.

“Objectives” are the goals identified for this particular project. In other words, our objective might be the fix the problem of delayed orders or the objective might be to strategically position the company as an internet presence for future customer needs.

During initial phase of this project various educational sector were visited by our selected group member in a view to identify the ongoing problems. During the visit an investigation was done where we found the problem of record keeping of the students. So we decided to overcome this situation by developing an application software dealing with digital way of record keeping which would be beneficiary to the organization and helps to get rid of tradition way of record keeping which is time consuming for both keeping and retrieving.

**3.3 Phase II : system requirement specification and feasibility study**

Software requirements specification is a rigorous assessment of requirements before the more specific system design stages, and its goal is to reduce later redesign. It should also provide a realistic basis for estimating product costs, risks, and schedules. Used appropriately, software requirements specifications can help prevent software project failure. Feasibility study is the preliminary study that checks whether the project will be completed with available resources and time boundary.

A feasibility study is an analysis of how successfully a project can be completed, accounting for factors that affect it such as economic, technological, legal and scheduling factors. Project managers use feasibility studies to determine potential positive and negative outcomes of a project before investing a considerable amount of time and money into it.

(Source:https://www.investopedia.com)

In this phase, We did the feasibility study of the project by studying whether the project can be accomplished within the available time using our limited resources such as programming skills and system that can run the developing tools required for the development of the application. The various feasibility studies are as follows:

1. **Technological feasibility:** This feasibility study is related to find out the viability of the project on the basis of required system for the accomplishment of the project. In this study we have found that we have required computer system this is eligible for the software development. The system is going to be developed in code blocks . It provides comprehensive function to make it user friendly. The data entry and report generation is also made easy. Backup and restore of the database facility are also provided. It also provides easy retrieval of data.
2. **Financial feasibility :** The propose of this study is to analysis the project's costs and revenues in an effort to determine whether or not it is logical and possible to complete.

The estimated cost of the project is not very high and is within the limit. Thus, the project is economical feasible.

1. **Managerial feasibility:** Even if the project is found to be economically, technically and financially feasible it can still fail if the people who implement or manage it are not capable. It is important that all ingredients of efficient management are taken into consideration in the proposed project. The success and the profitability of the project partly depend on managerial competence.

The group leader of this project has good leader ship skill and also managerial skill that is required for the successful completion of the project.

1. **Time feasibility:**  The time management for the project was done by first allocating a certain workload to all the individuals of the group and then making approximate estimation on how much time each part of the project will take approximately. After

which the project got a head start.

**3.4 Phase III: System Design**

Based on the user requirements and the detailed analysis of a new system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the development of a system. The logical system design arrived at as a result of system analysis and is converted into physical system design. In the design phase the SDLC process continues to move from the what questions of the analysis phase to the how . The logical design produced during the analysis is turned into a physical design - a detailed description of what is needed to solve original problem. Input, output, databases, forms, codification schemes and processing specifications are drawn up in detail. In the design stage, the programming language and the hardware and software platform in which the new system will run are also decided. Data structure, control process, equipment source, workload and limitation of the system, Interface, documentation, training, procedures of using the system, taking backups and staffing requirement are decided at this stage.

There are several tools and techniques used for describing the system design of the system. These tools and techniques are: algorithm, Flowchart, E-R diagram which are shown below.

We have decided to use c language for the system developing using code block (developing tool) version 17.12. The developed program will have the following minimum system requirements to run and perform smoothly:

* **Os** – windows xp or later versions
* **RAM**- 2 GB
* **HARD DISC –** 250 GB
* **PROCESSOR –** dual core 2 ghz

**Algorithm:**

An algorithm is a step by step method of solving a problem. It is commonly used for data processing, calculation and other related computer and mathematical operations.It is also used to manipulate data in various ways, such as inserting a new data item, searching for a particular item or sorting an item.

The general algorithm for the model of the program which is created before the actual coding is shown below:

Step 1: start

Step 2: user log in

1. Enter user name
2. Enter password

Step 3: to enter student’s data

1. Enter student’s id
2. Enter student’s name
3. Enter father’s name
4. Enter roll no
5. Enter address
6. Enter faculty
7. Enter level
8. Enter mobile no
9. Enter email address

Step 4: to view student’s record

1. Enter student’s id

Step 5: to edit student’s record

1. Enter ‘r’ to re-write record
2. Enter ‘d’ to delete record

Step 6: to re-write student’s record

1. Repeat step 3

Step 7: to delete student’s record

1. Enter student’s id

Step 8: to generate marksheet

1. Enter faculty
2. Enter level
3. Enter number of students
4. Enter subject name
5. Enter id of nth the student
6. Enter name of nth the student
7. Enter marks of nth the subjects

(loop from v to vii repeated)

Note: nth = no. of student starting from 1 to n number of student

Step 9: to change login user name and password

1. Enter old user name
2. Enter old password
3. Enter new user name
4. Enter new password

Step 10: stop

**Flow chart:**

flow chart for main();

Case default

Case first

Switch option

Home\_menu()

Is user password correct ?

Does user name file exist ?

Read user password

Read user name

login()

Flow char for login();

yes yes

false

break;

true

yes yes

Switch option

Case default

Case first

false

break;

true

**ER diagram:**

An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation of an information system that depicts the relationships among people, objects, places, concepts or events within that system. An ERD is a data modeling technique that can help define business processes and be used as the foundation for a relational database.

**Importance of ER diagram:**

Entity relationship diagrams provide a visual starting point for database design that can also be used to help determine information system requirements throughout an organization. After a relational database is rolled out, an ERD can still serve as a referral point, should any debugging or business process re-engineering be needed later.

The figure below shows the interrelationship between the administrator and the various entities. The administrator can manage – store, edit and delete the information of students which includes name, id, roll no, father’s name, faculty, level, phone no, email address of the student. An administrator can also change his/her login user name and password for the context of the data and information security. An administrator can also generate marksheet of different faculties.

department

adds

changes

Students’ records

manages

administrator

Log in

does

marksheet

generates

1

**1**

**N**

**1**

**1**

User’s account

Fig 4: ER diagram of student’s record management system and marksheet generator

**3.5 Phase IV : Development / coding**

The system design needs to be implemented to make it a workable system. his demands the coding of design into computer language, i.e., programming language. This is also called the programming phase in which the programmer converts the program specifications into computer instructions, which we refer to as programs. It is an important stage where the defined procedures are transformed into control specifications by the help of a computer language. The programs coordinate the data movements and control the entire process in a system. A well written code reduces the testing and maintenance effort. It is generally felt that the programs must be modular in nature. This helps in fast development, maintenance and future changes, if required. Programming tools like compilers, interpreters and language like c, c++, and java etc., are used for coding .with respect to the type of application. The right programming language should be chosen.

In this phase we did the coding of the specified system software within the estimated time according to the algorithm and flow chard which is designed in the designing phase. The required application software has been successfully developed with less bugs and errors.

**3.6 Phase V: Testing**

Before actually implementing the new system into operations, a test run of the system is done removing all the bugs, if any. It is an important phase of a successful system. After codifying the whole programs of the system, a test plan should be developed and run on a given set of test data. The output of the test run should match the expected results. Sometimes, system testing is considered as a part of implementation process.

Using the test data following test run were carried out:

1. **Program test** : When the programs have been coded and compiled and brought to working conditions, they must be individually tested with the prepared test data. All verification and validation be checked and any undesirable happening must be noted and debugged (error corrected).

During our developed program’s test, we found that some of the library functions like getch(), clrscr(), remove() etc were not working properly and desirably and some are not even responding.

1. **System Test** : After carrying out the program test for each of the programs of the system and errors removed, then system test is done. At this stage the test is done on actual data. The complete system is executed on the actual data. At each stage of the execution, the results or output of the system is analyzed. During the result analysis, itmay be found that the outputs are not matching the expected output of the system. In such case, the errors in the particular programs are identified and are fixed and further tested for the expected output. All independent modules be brought together and all the interfaces to be tested between multiple modules, the whole set of software is tested to establish that all modules work together correctly as an application or system or package.

After the correction of the developed errors and bugs which were encountered in the program test, we have done system test. The develop software works properly.

The debugging is done as follows:

Getch() function is replaced with system(“pause”) function which is slightly different but their function is same, so it doesn’t cause much trouble. Similarly clrscr() function is replaced with system(“pause”) function .Here, remove() function is not working on windows 10 operating ,so we changed the operation system to windows 8.

**3.7 Phase VI: Implementation**

After having the user acceptance of the new system developed, the implementation phase begins. Implementation is the stage of a project during which theory is turned into practice. The major steps involved in this phase are:

* + Acquisition and Installation of Hardware and Software
  + Conversion
  + User Training
  + Documentation

The hardware and the relevant software required for running the system must be made fully operational before implementation. The database needs to be setup with security and recovery procedures fully defined.

During this phase, all the programs of the system were loaded onto the user’s computer. After loading the system, we gave training to the user. Main topics of such type of training were:

* How to execute the package?
* How to enter the data?
* How to process the data (processing details)?
* How to take out the records?

After the users are trained about the computerized system, working has to shift from manual to computerized working. The process is called Changeover.

**3.8 Phase VII: maintenance**

Maintenance is necessary to eliminate errors in the system during its working life and to tune the system to any variations in its working environments. It must meet the scope of any future enhancement, future functionality and any other added functional features to cope up with the latest future needs. It has been seen that there are always some errors found in the systems that must be noted and corrected. It also means the review of the system from time to time. The review of the system is done for:

* + - knowing the full capabilities of the system
    - knowing the required changes or the additional requirements
    - studying the performance.

If a major change to a system is needed, a new project may have to be set up to carry out the change. The new project will then proceed through all the above life cycle pha

**CHAPTER IV**

**CONCLUSION AND FUTURE ENHANCEMENT**

**4.1 Conclusion:**

In this way we have successively completed this project with the collaboration of team members. While making the project we learnt a lot about coding and designing techniques. We also enjoyed while working in a group and knew the power of working in group. It was very interesting and joyful time while we were doing a teamwork.

Almost all of the predetermined objectives of the system was fulfilled by the developed system. After the introduction of the system it was easier for keeping students’ record and marksheet can be generated with less time and effort.

**4.2 Future enhancement:**

Though the software fulfilled all the pre-determined objectives, it is primitive and lacks many futures that can be introduced to make it more useful and helpful.

Following are some of the features we planned to add in the system in the future:

* graphic user interface
* network environment; implemented on intranet in future
* validation checks to check various input like phone no , email address etc

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**APPENDICES**

**Gantt chart :**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **May 4** | **May 5** | **May 6** | **May 7** | **May 8** | **May 9** |
| Problem identifying |  |  |  |  |  |  |
| Requirement |  |  |  |  |  |  |
| Resources collection |  |  |  |  |  |  |
| Rough Designing |  |  |  |  |  |  |
| Analysis |  |  |  |  |  |  |
| Feasibility study |  |  |  |  |  |  |
| 1. Technological feasibility |  |  |  |  |  |  |
| 1. Economic feasibility |  |  |  |  |  |  |
| 1. Time feasibility |  |  |  |  |  |  |
| 1. Managerial feasibility |  |  |  |  |  |  |
| Design |  |  |  |  |  |  |
| 1. Algorithm |  |  |  |  |  |  |
| 1. Flowchart |  |  |  |  |  |  |
| 1. ER Diagram |  |  |  |  |  |  |
| Coding |  |  |  |  |  |  |
| Testing |  |  |  |  |  |  |
| Maintenance |  |  |  |  |  |  |

Fig :- Gantt chart