1. **Personal background.**

We are a group of undergraduate students at Moi University, school of biological and physical sciences pursuing Bachelor of Science in Computer Science. We are currently at our third year of four years academic period. We are enthusiast programmers and this has been a motivating factor in doing a software oriented project.

Having gone through high school life as students and after visiting some schools and assisting in compiling of results and conducting some other supportive duties in high school we saw the hardship experienced by using the old manual way of doing things. We also taught in high school as assistant teachers after completing KCSE.

We discovered that with programming we can solve many problems and save on time resource that is usually spend in solving day to day problems. Time is an expensive resource.

1. **Introduction**

This is a proposal for a web application management system. The system attempts to automate the various activities found in a high school which currently are done manually. Some of these activities are:

* Admission of students where there is need to keep records on the students details such as names, admission numbers, parent/guardian names, marks acquired at Kenya Certificate of Primary Education level, birth certificate numbers, rooms allocated to the students by the boarding department e.t.c
* Examination processing activities such as recording marks, sorting marks and making remarks on the performance.
* School resources allocation such as books. A reliable system need to be in place to monitor and track these resources and to ease the process of students clearing out.
* Student fee accounts processing.
* Keeping student health records
* Catering inventories.
* Creating publicity about the school through online advertisement.
* Improving school data security.

1. **Organization overview**

The target organization is Tech High School. It was started on August 2001. It is a learning institution offering 8-4-4 Kenya system of education. It is a private Boys boarding school and It is has form one to form four classes each having 4 streams. It has an estimated population of about 800 students and 60 teaching and non-teaching staff. It is located at Nairobi county about 15 km from CBD. The school management structure consist of: the principal, deputy principal, teachers, departmental heads and student governing council.

1. **Problem statement and scope of the project**

**Problems statement**

High schools are characterized by many activities most of which are being done manually. Manual driven processes are in most cases prone to errors, they are time consuming and they waste a lot resources, they also reduce the scope at which information can be accessed. The following activities are done manually in a high school and the problems that arise as a result.

* **Examination processing.**

Examination processing involves activities such as recording Continuous Assessment Test (CAT) marks and End of Term Marks, tallying of marks, finding mean grades, sorting students based on their mean grades, making remarks on students’ performance and generating students’ results transcripts. When these activities are done manually, they result to the following problems:

* A lot of time is consumed during marks tallying, finding mean grades, making remarks and generating transcripts
* Retrieval of a single record at glance is difficult. Example to get a single student result transcript one has to peruse across a booklet of transcripts. Manual examination processing also lacks the capability of filtering exam records based on students and exam periods (first term, second term and third term).
* Manual examination processing is very tedious. It is not easy to tally marks for about 800 students, getting their mean grades, sorting them, and making remarks on student performance.
* Manual examination processing also reduces the scope at which results can be accessed. For example a student has to physically visit the school to acquire a transcript. It will be expensive for the student in terms of travelling and time consumption. Thus availability of results processed manually is not always guaranteed.
* **Boarding rooms allocations**

Manual bed space allocation usually comes with problems such as, locating the dormitory at which a student reside in case there is inspection and tracking of the available bed spaces. For example, boarding master will have to count manually the number of available bed spaces by visiting the dormitory houses. This method may compromise the accuracy of available bed spaces.

* **Managing catering inventories**

Manually managed catering inventories are prone to errors which may result to a big loss. Accessing such inventories takes time which also affects the school budget preparation. They is also less assurance of availability of this inventories in the future. Hardcopies are prone to damages for example books are easily destroyed by water.

* **School resources allocation such as books and equipment.**

Usually records of students under which resources are allocated to, are stored in books. This makes it difficult when the students are clearing because accessing many records in books takes times and wrong records about allocated resources may result to conflicts during clearing out period. Loss of these records can also result to very big loss for the school in case they record books are damaged. It is also difficult to determine the quantity of resources the school has. Example finding the total number of form 1 textbooks. This will make it hard for the school management to manage resources and to plan in advance.

* **School publicity**
* **Students check in and check out recording**.

Student gate pass are in most cases granted by the teacher on duty. There is need to keep track of the number of students within the school compound and those who are absent. These types of records are stored in books. Checking the number of times a student has been absent from school is difficult because large quantities of records stored in books and handwritten is not presentable enough for easy assessment. For example it will take a lot time to determine the number of times a student has been absent.

* **Student governing council elections.**

It is difficult for a school to run without a student governing council. A student governing council acts as a bridge between the students and the school authority. In most cases elections at schools are done manually. Manually elections are more likely prone to errors such as in tallying of votes and establishing eligible number of voters. Manual elections lack the transparency at which votes are being tallied. This may lower the confidence and trust the students have with such a voting system which results to conflicts between the students and the school authority. The result of conflicts is students’ demonstration which results to damage of property, interference of the smooth learning environment hence poor school performance.

* **Keeping of students’ heath records by the school nurse.**

Students’ health records are important in determining the course of action in case a student health complications is beyond the school nurse capabilities. The records are also important in monitoring the health of the students, those ill students whose are not recovering may be taken to a high level hospital. The current system (book records) being used by the school nurse is not up to the standards because books may be damaged and it may be time consuming filtering the health records of a single student because all students’ records are placed in one book which may be voluminous where students are many.

* **Filtering student details**.

For example the school principle may want to know about a specific student profile in terms of academic performance, disciplinary records, health records or school resources allocated to the student. With the current system these records are scattered in various departments. For health records the principal will have to see the school nurse, for academic performance he will have to visit examination department. This makes it hard to access this information especially where the principle has a big number of students to deal with.

* **Revision materials**

The current system offer less quantity of revision materials because it primarily dependents on hard copies that is expensive to print in large numbers.

**Solution**

Having critically analyzed the above problems, there was need to come up with a system that can solve these problems.

This proposed school management system attempts to solve the above problems in the following ways:-

The high school management system will automate the examination processing. The system will provide a user interface with a list of students and the subjects they are doing. This is where the teachers or examiners will have to key in the marks according to the subjects they teach. For example a biology teacher will key in biology marks to all respective students other teachers will also key in marks based on their subjects.

With the marks already in the system. The system will automatically execute the following tasks:

* It will make summation of the END of Term marks and CAT marks for each subject and for every student.
* It will tally the total marks for each student.
* It will compute the mean grade based on the total marks that and the number of subjects the student is doing for example for form 1 to form 2 the total number of subject is 11 while for form 3 to form 4 the number of subject is 9.
* The system will then sort the students based on their mean grades and display a sorted list where the teacher will award positions to respective students.
* The system will automatically award remarks based on each student performance. The remarks will appear on the provisional transcript.
* The system can then filter the results in a way that one can get the results of a single student by just entering a student’s admission number and then clicking the search button. The system will be up to the task of selecting the searched student from a big list of the student based on the admission number and display the student’s results.
* The system will also be capable of formatting the exam results to a presentable PDF transcript file for each and every student which the examiner can download or print and award it to the students as a hard copy where need arise . The student will also be able to view the results online. But for the student it will be read only that is, the student will only view it but no download link because the transcript will have to be verified by the examiner.

With the above capabilities the system will reduce the time spent in processing examination. It will increase the accuracy of the results and it will save the teachers from the cumbersome manual system. It will increase the scope at which examination results can be accessed. It will be possible to remotely access results online irrespective of the physical location. This will save on time spent on travelling to school to fetch results and also the travelling expenses incurred by the student or guardian who may require results in absentia from school.

The proposed system will also increase the scope of learning by introducing E-learning platform where students can download revision materials.

The system will have a well-defined and dedicated list of available bed spaces that will be always up to date. The bed spaces will be allocated dynamically to the students. For every bed space allocated, the same is decremented from the total bed spaces. The boarding master will be in a position to make statistics about the remaining bed spaces and to which student a bed space is allocated. The system will generate a list of available dormitories and their available bed spaces. The number of available bed spaces is inversely proportional to the allocated spaces. Available bed spaces will decrease as more bed space are allocated. This process will be automated by this proposed system. This will save the time spend when manually calculating the available bed space by visiting individual dormitories. The availability of always updated bed spaces will enable the dorm master to plan at any time. Since students are allocated unique bed spaces it will be easier to follow up students and monitor the boarding facilities and make the students have a sense of responsibilities for the bed space they are allocated to.

The proposed system will also automate the catering inventories. Since are catering inventories will be recorded to a central database it will be easier and very fast to search records based on time and category. For example the principle can compare the catering budget for previous years and allow him/her plan for the future. This is made simple because the system can sort the records based on the required time. The proposed system will also be able to save time on arithmetical calculations such as quantities and the total amounts of catering items. This will save the school from loss that will have occurred when there was errors that are associated manual calculations. Availability of data is also guaranteed in future because it is easier to have a backup database than a backup book records. The proposed system will also format this records in a manner that is presentable than in books records.

For the allocation of school resources, the proposed system will maintain an up to date list of available school resources and under which responsibilities they fall to. For example the proposed system can generate a list of books and the students whom they are allocated to. This will make it easier for the school management to track school resources. It will also facilitate budgeting because the system will maintain reliable records such as available books. The system will also automate clearing out process for the students when they are returning books or resources that they have been allocated. This will save time resource and errors that may arise when the manual means are used to issue resources and to claim this resources.

The proposed system will also manage day to day records that arise during the running of school. It provide an interface where the teacher on duty can write a report about his/her duty. The teacher can also access individual students and insert records such as when the student was granted gate pass permission and when the student checked in to school. This will help monitor the students in terms of those that are within the school compound and those that are absent. The system will also provide a platform where teachers can record disciplinary issues to respective students such one can track the behavior of a specific student for a given period of time. This will aid in offering guidance accordingly to respective students whose behavior is wanting.

The proposed system has so much to offer as long as Student Governing Council elections are concerned. The system will promote transparency and trust to the students in the following ways:-

* The proposed system will have an interface where students can register for elections and where they will be allocated with voting registration numbers.
* The system will have an interface where authorized electoral commission can register candidates using details such as their passport pictures, their post they are vying for, the names e.t.c.
* Voting can take place at the school computer lab where there is internet connection and 10 students can vote at ago across 10 computers.
* When the registered student logs in to the voting interface the system will display all the candidates and the students can select only one candidate for every post and once voting is successful the voting registration number becomes invalid and cannot be re – used .
* The system will automatically compute votes for various candidates as result stream in.
* The system will also project results on a big screen where the students can observe how various candidates’ votes are streaming in, and who is leading based on provisional results.

With this kind of system functionality provisional portion of results are made available to the students even before the final results. This will reduce the tension which the students usually have when the results are announced at once. Due to the transparency that will be offered by the system election conflicts are unlikely to occur.

The system will provide a platform where the school nurse can search students and fill in their respective health records. Hence by just entering a student admission number the school nurse is able to view all health history of a student at once. This will enable the nurse to decide the course of action for a student in case there is health complications beyond the nurse capability.

In overall the proposed system will centralize data from various departments such as catering, examination, nursing department and boarding department where authorized users can access information at a central point from this department. For example a school principal can search records about a student and all information related to student is fetched from all the departments and displayed at once. This will save the principal’s time of having to search student details from voluminous scattered records as in manual system.

The system will also fastened the budgeting process because departments can submit their budgets at their offices and then the budgeting committee can access all this departmental budgets at a central point.

The goals of the proposed system are:-

* To provide a wider scope of information access through online platform
* To streamline information access by centralizing records
* To save on time accrued when using manual systems
* To promote peace and understanding between the students and the school authorities by ensuring fair and transparent student governing council elections.
* To improve the students’ performance by providing a blue print of records where they can gauge their improvement.
* To provide reliable school records that are used in decision making.
* To monitor school resources.
* To offer smooth running of school by automating processes such as students’ admission, examination processing and records synchronization of records.
* To advertise the school through the online platform.
* To provide an E-learning platform where students can download revision materials

1. **Description of the current system**

The current system is dominated by manual practices in almost all the system processes

The systems hardware used comprises of printers, photocopies, computers for editing documents, calculators for tallying marks and fee balances.

The current school processes are:

In the examination department marks are recorded on books and tallying is made manually using equipment such as calculators. The marks are also sorted manually to determine the positions for all the students. Result transcripts are manually prepared one at time. For example the principle has to sign all transcripts and the class teachers have to make remarks on every transcript. Individual students’ results are searched from a long results list. Students are only provided with a hardcopy of a transcript.

The school nurse keeps records on a hand written book. Different students’ health records are written on the same book and on the same page. Tracing the health records is difficult. The school nurse in most cases rely on the current student health status since view the heath history of a particular student will take time.

The school budget committee has to mobilize the departmental heads at one location for them to submit their budget requirements. This is characterized by a lot time wasting than when the departmental heads would have sent their proposed budget at their precision places.

Elections of students’ leaders is manual. Students have to fill their choices of candidates on a piece of papers and then submit them to the electoral commission who tally the votes manually. The current voting system is characterized by wastage of resources such as the voting materials, there is a lot of spoilt votes and errors in the final tally of results. It also lacks transparency when the votes are being tallied.

Students are provided with hardcopies of fee structures and fee balances. This involves consumption of any printing papers and ink cartilages which usually makes the operation costs high.

The catering department maintains their records in books. Various catering items are handwritten in books and their quantities and amounts computed manually. It is usually hard to filter results for a single item. And the records in books are not very presentable.

School resources such as books tools are allocated to students by filling the resource number alongside respective student’s names and details on books. Various departments maintain their own records of allocated resources and students under their responsibility. Therefore the records on allocated resources are scattered across various departments.

Students’ details are searched manually on books. The details are scattered in various departments. For example exam results in most cases are found processed at examination department, boarding details are found at boarding department.

Records such as time when students is granted gate pass and when the student’s checked in are written manually on a book. Disciplinary issues are recorded on books. Searching all the discipline records for a single students takes time because there is only one book housing all the students’ discipline records.

The student rely only on hard copies revision materials which are few.

1. **Requirements for the proposed system design**

**Hardware and software requirements**

* The requirements for the proposed system design are:
* A laptop for each group member with the following installed software.
* Web editor precisely notepad++
* Browser – can be Mozilla Firefox, Chrome or Operamini.
* Xampp web server with phpMyadmin version 4.2 or later.
* DomPDF for generating PDF from HTML

**Functional requirements**

* Examination processing.
* Bed space allocation.
* Online voting for student leaders.
* School resources allocation management
* Catering inventories management.
* Student details processing.
* Fee balance processing
* Students’ health record management
* E-Learning management
* Centralization of school records.

1. **Implementation plan**

The following are steps to follow when implementing the proposed system.

**Requirement specifications**

After analyzing the problem in hand the following are the services the proposed system should provide.

**Functional requirements**

* Examination processing.
* Bed space allocation.
* Online voting for student leaders.
* School resources allocation management
* Catering inventories management.
* Student details processing.
* Fee balance processing
* Students’ health record management
* E-Learning management
* Centralization of school records.

**Non-function requirements.**

**Security**

It will be achieved by grouping the users of the system into groups each with different capabilities as follows.

The school Principal- will have multi-access to all school department records and students’ details.

The school administrator- will have the privileges of registering new students.

Catering manager- will access to the catering inventories.

Teachers – will have access to examination module where they can key in marks or updates marks. Will also have access to students’ details and respective departmental records.

School nurse- will have access to student health records.

Boarding master-will have access to boarding facilities.

School account clerk- will have access to student fee balances.

Students- will have access to student profile and voting panel whenever it is opened.

All departments will have different login SESSIONS to prevent illegal access to departmental records for example the login SESSION will be different from that of a teacher so that when student logins in he cannot access content that only a teacher is entitled to. The same security measure is applied to all users.

**Speed** the system is will be a light weight software hence it will consumes less resources. But the speed of the system is directly proportional to the speed of the school network.

**Implementing Design.**

Incremental development process will be used to develop the proposed system where requirements process will be interleaved with development process. This will provide the scalability of improving the system as development progress. This will also facilitate prototyping which will be used to gauge how the objectives of the proposed system are being achieved and to gather more requirements that will make the proposed system up to the tasks.

Objectives will be achieved by decomposing the proposed system into modules or units such as examination module, voting module, e-learning module etc. which will be developed separately and then assembled together when fully developed. This will make it easier to do unit testing and system testing.

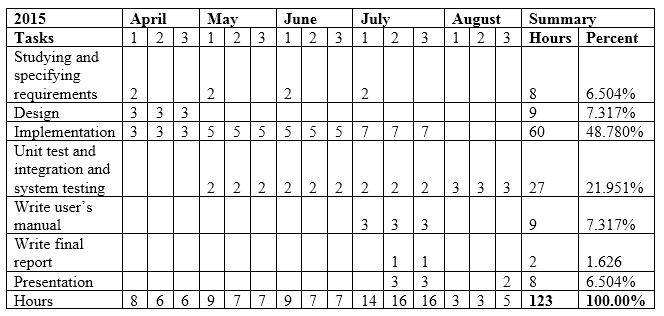
**Testing and integration of units or modules**

The following are the modules which will be developed and how they will be tested.

1. Examination module-will be tested by entering the CAT and end of term marks to a predefined list of about 10 students per class (form1- form4) and then generating sorted list and result transcripts for individual students.
2. The admission module will be tested by registering 10 students per class.
3. Voting module will be tested by preparing a sample candidates and voters. And trying to voting and generating final votes for the sample of candidates.
4. Login module will be tested using the login details of a sample of users of the system and trying log them out.
5. Search module. Will be tested by searching a predefined results from relevant departments.
6. E-learning module-will be tested by uploading some contented and then logging in to the portal and try to download some content.
7. Resources allocation module- will be tested by assigning resources to students’ resource numbers example book number and then trying to clear the students.

Once all the modules are fully tested. They will be integrated using hyperlinks to come up with the whole proposed system. The system will then be fully tested to locate broken hyperlinks. With the system fully functioning as required requirement document will be written alongside training manual. This will be followed by group presentation of how the system is working.

1. **Project schedule**



1. **Primary contacts**

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| --- | --- | --- | --- |
| **Name** | **Address** | **Phone number** | **Email** |
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1. **Supervisor approval**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature: \_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_