

# Certificate Generation System

Srushti A. Shimpi, Sanket Mandare, Aman Trivedi, Tyagraj Sonawane

Dept. of IT, PVPPCOE, Mumbai, India.

*shimpisrushti@gmail.com, sanketmandre@yahoo.in, Aman.trivedis@gmail.com, tyagraj.sonawane@gmail.com*

**Abstract**— the certificate generation system is flexible for generating the mark-sheets of the students. This system is mainly based in the database technology and the credit based grading system (CBGS). The system is targeted to various enterprises, schools, colleges and universities. The development of system focuses at describing the tables with columns/rows & sub-columns, sub-rows, rules of data selection for calculating credits and grades of the students & summarizing exam data, particular table, column/row and formatting the data in destination document. Certificate generation system can be used in universities to automate the distribution of digitally verifiable mark-sheets of students. The system accesses the students' exam information from the university database and generates the gadget-sheet and mark-sheets of all the students in a portable document format which provides authenticity of the document and can be verified easily.

**Keywords:** *Credit, grade and mark-sheet, mark-sheet generation.*

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## I. INTRODUCTION

The certificate generation system is a system which allows the digital automation of the mark-sheets of the students. The system will generate the mark-sheets in Portable Document Format which is globally accepted format for files. The PDF document is very difficult to modify and requires the use of the complex software.

To simply put, system is to provide the mark-sheet for credits based grading system in user friendly and secure manner. The credits based grading system enables a much require shift in focus from teacher-centric to learner-centric education. It also focuses on the continuous evaluation which will enhance the quality of education. It is very much essential to implement credits based grading system based higher education worldwide.

The efficiency of the system would increase in a leap and bounds considering the fact that system will be automated & would be corruption free. Along with the above mentioned privileges, it also ensures security & spreads the awareness about the university rules and regulation.

## II. REVIEW OF LITERATURE

The certificate generation system is kind of a document generator. There have been number of technologies proposed to generate the document or reports.

### A. Existing System

#### 1) Digital Signature based mark-sheet generator:

A digital signature or the digital signature scheme is type of asymmetric cryptography used to simulate the security properties of hand written signature on the paper. The output of signature process is digital signature. It provides authenticity and integrity to data<sup>[2]</sup>.

#### 2) Digital academic transcript using encrypted QR code:

Mark-sheet embed the digital form in mark sheet using encrypted QR code, so that any unauthorized user cannot retrieve any information<sup>[1]</sup>.

### B. Disadvantage of Existing System

#### 1) Association of digital signature and trusted time stamp:

Digital signature algorithm and protocol do no inherently provide the certainty about the date and time at which underlying document was signed<sup>[2]</sup>.

#### 2) Non repudiation:

In cryptographic context, the word repudiation refers to any act disclaiming responsibility for message. It is used to remove old expired certificates from repository. It is matter for security policy and responsibility of authority to keep old

certificates for a period of time if non-repudiation data service is provided [2].

3) Unavailability of hardware:

Even though the use of QR code in a mark-sheet that possess ability to scan QR code. Also for scanning purpose one must have hardware which adds a cost to system.

4) Lack of user friendly interface:

Due to use of DOS or user interface which are not user friendly. It also uses various difficult commands to complete the number of tasks. The existing system fails to provide a good user interface. Also understanding of the user interface of existing system is tedious and time consuming whereas the new system is self-explanatory and easy to use as far as user interface is concerned.

### III. PROPOSED SYSTEM

The certificate generation system is to ensure an efficient certificate management using huge data and to provide mark-sheets for credit based grading system (CBGS) in very user friendly manner by not making it very complex.

The system being automated and generalized, the system ensures to reduce manual errors by reducing manual efforts. An added asset to the feature of system is that it aims at improving and easing out the work of the existing system in very sophisticated way.

The technology is rapid and able to generate, store & display the mark-sheets of the students. The system provides advance reaction capabilities and automatic operator of the internal calculation based on university rules with the information from the database. It also works with various standards of the mark-sheets.

### IV. WORKING OF CGS

In this proposed system, the admin of the system enters the marks of each student. That information will be stored in internal collection information database. In this system, percentage and grade is calculated manually.

After the marks of the students entered by the admin, it generates the gadget-sheet and the mark-sheet of all the students automatically with the grades calculated. Mark-sheets will be in PDF format. PDF marks-sheets cannot be easily tampered with and required use of complex software. The PDF file of mark-sheet of every student will be stored in the separate database. And then application makes mark-sheets available via internet on demand.

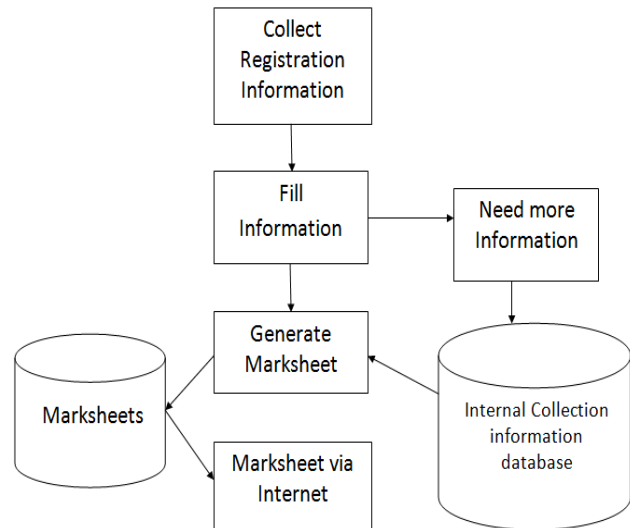


Fig.1. System architecture of Certificate Generation System

### V. ALGORITHM

This is how our system will work. Steps for the implementation of system are as follow:

**Step 1:** If admin is operating the system, login id and password. If student is operating the system, they can access the system by providing the registration id.

**Step 2:** Check if provided login id and password or registration id is correct, if not go back to step 1 and if correct proceed for the step 3.

**Step 3:** If admin is operating the system, he can access the system by updating the database, changing the data in the database and can get the required information from the database. If students are operating the system, the can only view the data.

**Step 4:** Then system will generate the gadget sheet of all the students and it calculates the grade and grade point of each and every student as per the Credit based grading system (CBGS).

**Step 5:** Then this system will generate the mark sheet by fetching the grades, pointers and credits from the gadget sheet previously developed.

**Step 6:** Then this information of students' marks are available to access to students by providing authentication. Admin will get requested mark sheet in PDF mark sheet for printing purpose. And only marks can be accessible to student.

**Steps 7:** These mark sheets then can be made printable by converting it into portable document format.

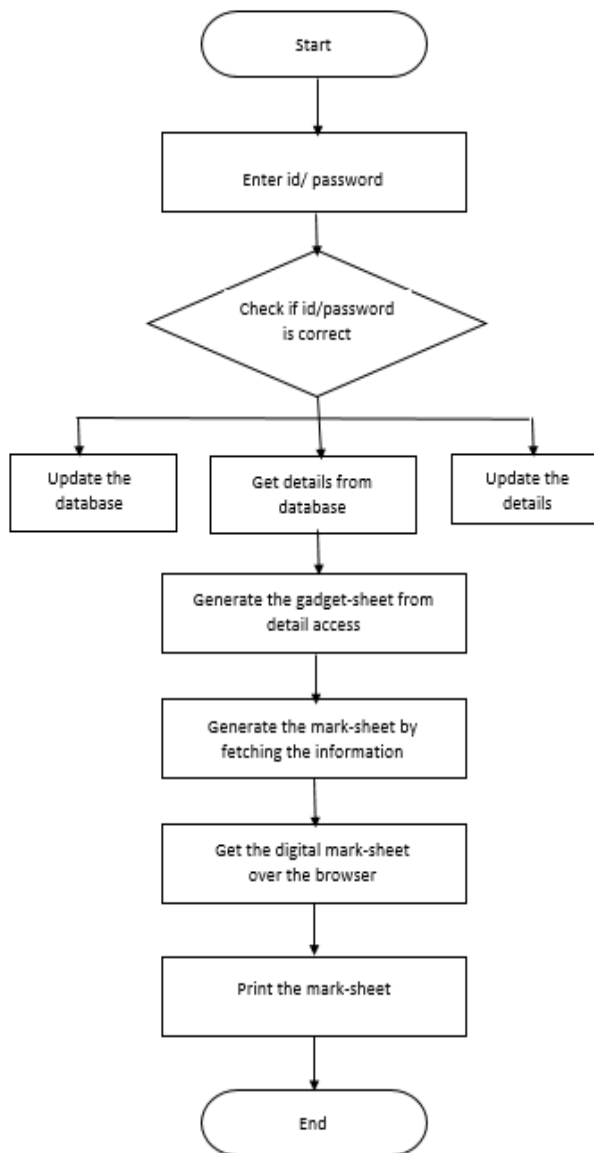


Fig.2. Flowchart for Certificate Generation System

#### VI. TECHNOLOGY AND CONCEPT

PHP is used for web development works as a server side scripting language and also it is used for general purpose programming. PHP code is interpreted by a web server with the PHP processor generates the resulting page which interprets the PHP code. It also includes interface capacity of command line and can be used standalone graphical application.

In this system input can be marks of the students of their theory exams, practical exams, internal assessment and term work. Grades and pointers of student can be calculated according to rules, formulae and ordinances. The formulae for calculation of grade performance index (GPI):

**Semester Grade Performance Index (SGPI):** The performance of semester is indicated by a number called semester grade performance index. SGPI is weighted average of the grade points obtained in all the courses by the student during the semester.

$$SGPI = \frac{C1G1 + C2G2 + C3G3 + C4G4 + \dots + CnGn}{C1 + C2 + C3 + C4 + \dots + Cn}$$

**Cumulative Grade Performance Index (CGPA):** An up to date of an overall performance of student from the time he/she enrolled in the university is obtained by calculating a number called cumulative grade performance index. It is calculated in similar manner of SGPI. CGPA is responsible to reflect final pass or fail status of student.

$$CGPI = \frac{C1G1 + C2G2 + C3G3 + C4G4 + \dots + CnGn}{C1 + C2 + C3 + C4 + \dots + Cn}$$

The rule is given below:

Table 1. Letter grades and their equivalent grade points applicable for under graduates

Percentage of marks Obtain	Letter Grade	Grade Points
80.00 and above	O	10
75.00-79.99	A	9
70.00-74.99	B	8
60.00-69.99	C	7
50.00-59.99	D	6
45.00-49.99	E	5
40.00-44.99	P	4
Less than 40.00	F	0

#### VII. RESULT AND DISCUSSION

The implementation phase of our project is still in progress. Thus far, we have successfully completed the implementation and work of the following factors:

1. Final outline of the gadget sheet.
2. Automated fetching of marks of the students from database.
3. Calculation of Grades and credits for each course.
4. Verification and evaluation of marks for special cases (Ordinance for grace marks)
5. Generation of grade points for each Course.
6. Determination of Grade Performance Index.
7. Display of Final Performance of the student in terms of Pass/Fail.
8. Veto Power Allocation for Admin Login.

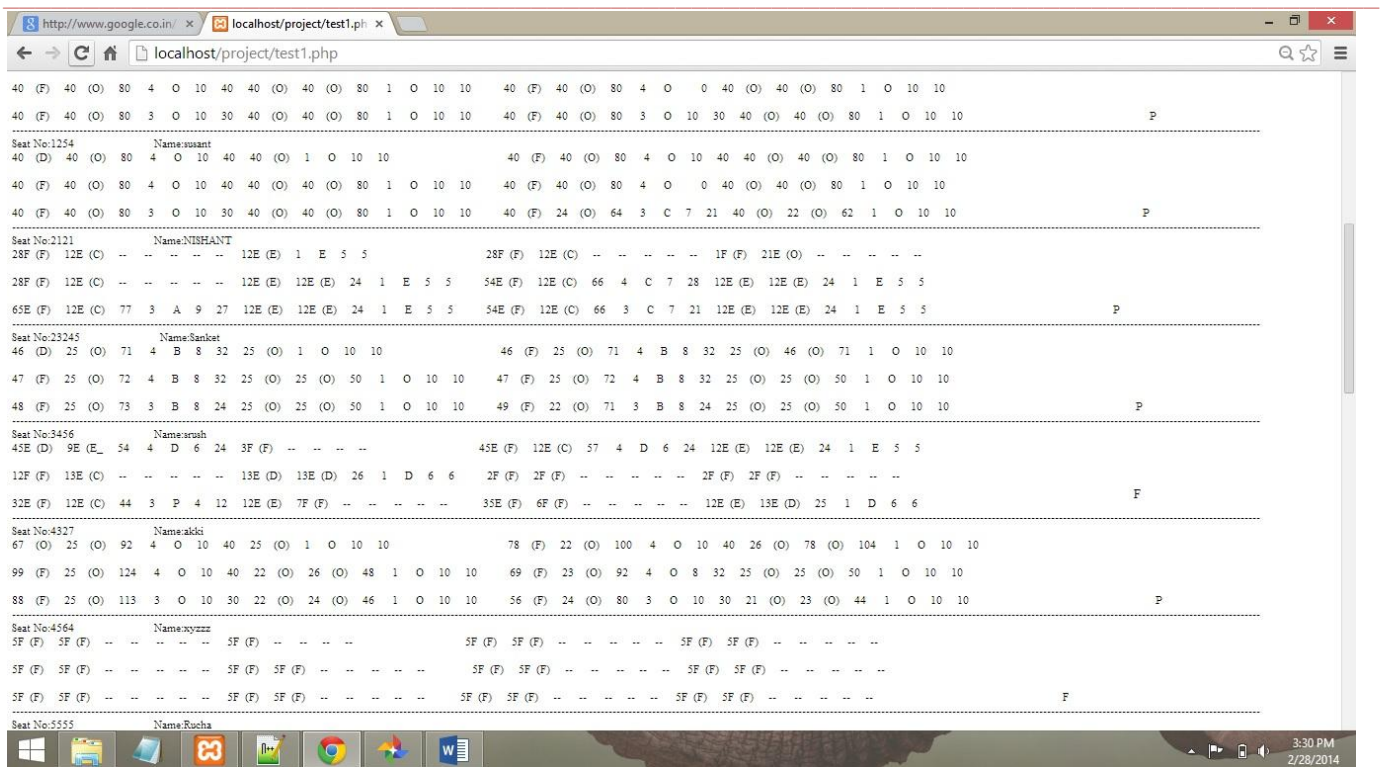


Fig.3. Screen shot of the implemented gadget sheet.

The following modules are currently being implemented:

1. Creation of individual mark sheets by fetching data from gadget sheet.
2. Availability of information of marks to individual student via internet/intranet.

### VIII. CONCLUSION

We have generated the gadget sheet calculating the grades, credits, grade points of each courses and Grade Performance Index of whole semester considering all the courses. Also determined the calculations for evaluation of marks for special cases (ordinances for grace marks in case of failure as per the university rules).

The system automated and generalized the system ensures to reduce manual error by reducing manual efforts. An added asset to the feature of the system is that aims at improving and

easing out the work of existing system in very sophisticated way.

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