

# Student Result Monitoring System

Mrs. Abhilasha Varshney<sup>1</sup>, Prakshi Lohani<sup>2</sup>, Seemant Tripathi<sup>3</sup>, Sonia Verma<sup>4</sup>

<sup>1,2,3,4</sup>*Department of Information Technology, Inderprastha Engineering College, Ghaziabad*

**Abstract** - A student result processing system is an automated digital solution for planning, preparing, evaluating examinations. These computation systems can prove useful for educational institutions and other examination testing bodies.

It all encompasses result analysis and generating performance reports of students according to year, branch, section, subject which is a complex and time-consuming process in every institute. The Student Result Analysis and performance Report Generator helps the user to analyze the result and generate its report, it also allows figuring out the overall performance of students, by providing academic results as an input in a format of Excel file. The Head of the Department can also access and analyze the percentage report of the student through pictorial representation which can be categorized subject-wise and section-wise including the overall performance of a particular department.

Student Result Monitoring System as described can lead to an error-free, secure, reliable, fast management system. Further, the System will help in better utilization of resources.

**Index Terms** - data mining, data classification, data analysis, data prediction, machine learning, etc.

## I. INTRODUCTION

The “Student Result Monitoring System” has been developed to override the problems prevailing in the practicing manual system. The application is majorly designed for an institute to carry out operations smoothly and effectively.

The application is reduced to avoid errors while entering the data. It also provides error messages while entering invalid format of data. No Formal knowledge is required for the user to use the system. Thus, it all defines the user-friendly behavior of the system.

An Automated Digital Student Mark Analysis System is a real boon to educational institutions and testing bodies. From planning and preparing to evaluate the student examination result processing system and frees up faculties and administrators so that they can focus on their other important tasks. This will help the

organization in saving time and resources used in the manual analysis of results.

## II. LITERATURE REVIEW

A related research is done to analyze the working of existing systems in order to move further with student result monitoring System.

Four existing systems are considered more relatable to the proposed system. The literature survey is mentioned below:

A. Faculty Support System (FSS): Shana and Venkatalalam proposed a framework named Faculty Support System (FSS), it is considered a low-cost system because of the cost-effective, open-source analysis software they used, named as WEKA which is used as a data mining tool. The domain expert added the new rule concept determined by data mining techniques such as classification technique. These classification techniques are used to predict the students’ performance based on the classified data sets. FSS majorly consider the factors that contribute to the results and performance of students in a particular course.

B. Student Performance Analyzer (SPA): SPA is secure web-based software that allows users to check the students’ performance and track the record of the overall data. It is a tool that is designed to analyze, display and store student assessment data. It is used by institutions worldwide to perform analysis by uploading raw student data once to the system. It identifies the students’ performance on the basis of expected level of student (above the expected, below the expected or at the expected). Other than that, it enables various kinds of students’ performance reports such as progress reports and achievement reports to be generated.

C. Intelligent Mining and Decision Support System (InMinds): InMinds helps University Malaysia

Sarawak (UNIMAS) to analyze the performances that depends on various factors in each department and course fields. The system enables the management in UNIMAS to control the areas that needed attention by having clear look at the figures, formats, and the risks involved. The features and flexibility provided by the system make the performance analysis optimized upto an ideal solution. Applied plots and charts to the system to ease the student performance interpretation. It uses WEKA, an open-source software used for data mining.

D. Student Performance Analysis System (SPAS): SPAS provides University Malaysia Sarawak (UNIMAS) a user-friendly system, easy to navigate and not complicated. Meanwhile, the student performance prediction is included in the SPAS to achieve the objectives. Furthermore, the reports are generated in Portable Document Format (PDF) makes it easily accessible. The system can help lecturers to automatically predict student performance, keep track and retrieve student's report in a particular course and semester, view the factors that affect the student's prediction result, generate student's reports.

#### Limitations:

It's a time-consuming process as the user has to type the database commands to store the data and to create a database and to remember all the commands is quite difficult. It is limited to a single system and a single user. Thus, a user who wants only to have some information needs to contact the administrator every time.

### III. PROPOSED SYSTEM

There are certain features from the existing systems that are employed during the design and implementation of the proposed system such as user interface, student performance prediction, illustration displays, and report generation. It is a Desktop based application that can be accessed from any system having required configurations.

#### Features:

1. System is highly user friendly with various controls provided.
2. The system makes the overall management much easier and flexible.
3. It's a desktop-based application and can be accessed once downloaded.

4. There is no risk of data mismanagement at any level.
5. Relationship between the administrator, faculty, and student can be maintained very easily.
6. The data entered will remain secured.

Major advantages over existing systems:

The main benefit of using the exam result monitoring services is, of course, the automated processes that are handled via the Internet overcoming the downsides of human interventions. The online result system nullifies the chances of errors, thereby improves accuracy. Some of the other benefits have been listed below:

- Quicker delivery of results: Result evaluation and scoring happens on just one click in the result monitoring system that allows users for a quick generation of rank-list.
- Accurate results: Reduced human intervention brings down chances of errors, and hence, the results delivered by the student mark analysis system tend to be accurate.
- Analytics: Clear and thorough analysis of results leads to a comprehensive report generation which is useful for all the participants involved, including department faculties, administrators and students.
- Bias-free checking: Reduced or nil human intervention in the student examination result monitoring system makes it free from personal biases and prejudices, and deliver valid, reliable, and accurate results.
- Transparency: Digitization of the entire process makes the student result monitoring system transparent and objective.

### IV. METHODOLOGY

The basic approach includes record-keeping and overall performance analysis of a student in different aspects. As follows-

- User-configurable grading system according to the examination pattern.
- Examination weightage.
- Calculated / Average marks.
- Accepting Grace marking.
- Special Analysis section.
- Sub-subject marks entry.

The application is developed to predict the upcoming result of the next semesters. Hence, we use Machine Learning Algorithms to implement such a system. There are certain steps that the system follows to achieve expected or desired results as:

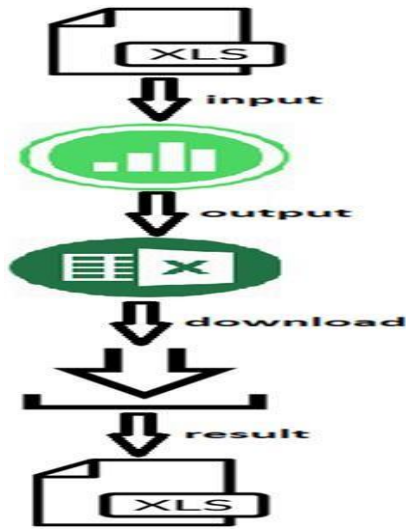


Figure 1. System overviews

The decision to implement the application in the form of Application Software was informed by the consideration that various types of data would need to be held, and a Software approach would be more appropriate due to the advantages of the advanced programming concepts. Computations will be more accurate and faster than the older approaches.

### V. IMPLEMENTATION AND DESIGN

To implement the system application-specific tools and technologies are used. Thus, it is a pure python-based implementation of the desktop application. These tools and technologies are listed as below: **PyQt5:** PyQt5 is the latest version of a GUI widgets toolkit developed by Riverbank Computing. It is one of the most powerful and popular cross-platform GUI libraries. PyQt5 is a combined set of Python programming language and the Qt library. It enables Python to be used as an application development language extended to C++ on different supported platforms including iOS and Android.

**Machine Learning:** Machine Learning is a sub domain of artificial intelligence that modifies a system to learn from a data and then apply the learnings on new data sets without the need for

human intervention. There are many types of machine learning algorithms and strategies available. In data science, an algorithm is a sequence of statistical processing steps.

**Data Analysis:** Data analysis is a process of analyzing, cleaning, modifying, and representing data to transform a raw data to useful information, concluding results, and decision-making. It allows interpreting information, identifying value of points and examines them to draw conclusions about the data thus transformed. It simply expands the knowledge about the data.

A particular stepwise process is followed by the system that shows the working structure of the designed system.

The overall process can be represented in a form of a flow chart as follows:

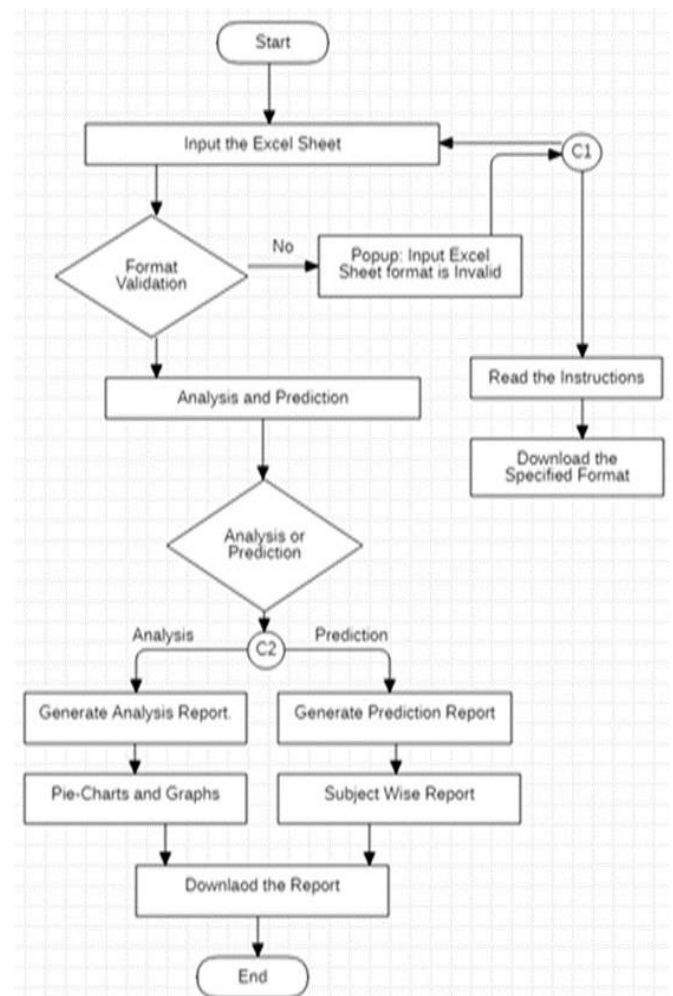


Figure 2. flow chart design

VI.RESULT

User Interface: The first screen that user interacts with is shown as below:

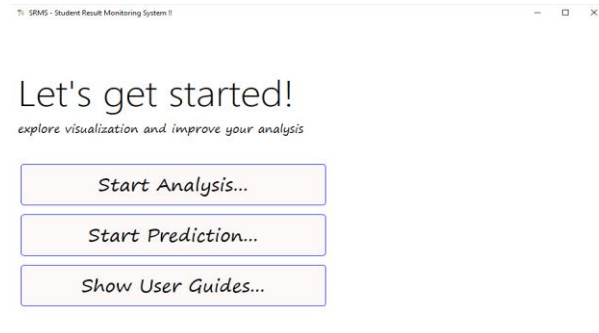


Figure 3. User Interface

Inputs: The system ensures the input to be in a specified format which can be counted as a limitation of the proposed system. Thus, the format specified will be an excel sheet (.xls).

S.No.	Roll No.	Name	FIFTH SEMESTER									
			RAS 501	RUC 501	RCS 501	RCS 502	RCS 503	RIT 053	RCS 551	RCS 552	RCS 553	RIT 554
1	1.603E+09	AAKASH JAIN	32	44	32	43	22	33	43	44	42	44
2	1.603E+09	ABHAS GUPTA	42	50	34	33	27	21	42	46	44	40
3	1.603E+09	ABHISHEK DUTT	43	37	32	38	44	44	42	42	40	44
4	1.603E+09	ABHISHEK SINGH	39	40	22	38	46	36	40	40	41	44
5	1.603E+09	ABHISHEK KUMAR	27	33	33	15	46	42	43	45	43	44
6	1.603E+09	ADITYA MISHRA	39	46	50	28	40	33	42	40	45	45
7	1.603E+09	AGAM GARG	51	51	43	32	44	38	46	48	46	46
8	1.603E+09	AISHWARYA RAJ	55	42	55	45	35	48	45	47	48	48
9	1.603E+09	AKANKSHA SINGH	48	30	30	28	33	40	44	40	46	45
10	1.603E+09	AKANSHA	36	27	38	33	31	21	39	40	40	39
11	1.603E+09	AKARMAH KHAN	37	39	42	35	40	30	40	40	39	40
12	1.603E+09	AKSHAY BAJETHA	33	31	54	33	39	41	41	40	44	39
13	1.603E+09	AMAN GUPTA	51	50	37	42	44	38	43	40	44	44
14	1.603E+09	AMAN PRADHAN	33	40	38	38	36	41	44	40	49	45
15	1.603E+09	AMAN SHARMA	34	30	46	36	26	22	41	39	45	43
16	1.603E+09	ANKUR GOEL	44	32	44	36	32	27	42	42	43	43
17	1.603E+09	ANSHIKA	40	36	32	43	33	40	43	46	46	46

Figure 4. Input screen

The result processing includes creation, evaluation, and result tabulation as important aspects for generating proper analysis report as an output.

Using certain python extended libraries output can be produced in a form of pi-charts, histograms, and other graphical representation.

Major python libraries used are numpy, pandas and matplotlib.

A pie chart is used to compare the proportion of data in each category. Thus, the analysis pi-chart generated represents the proportion of observations in each category.

The final output generated after applying analysis is shown below representing data of a section providing students examination result:

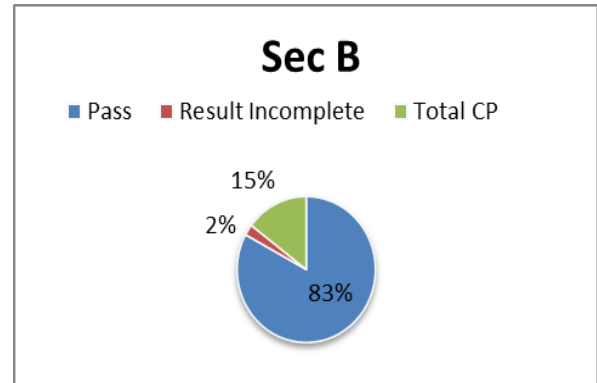


Figure 5. Section-wise pi-chart representation

Further, the system is able to generate the overall percentage of students passed in a particular examination after applying analysis on the input data. A subject wise analysis between sections is represented in a form of bar-graph comparing average result of a particular subject in two sections.

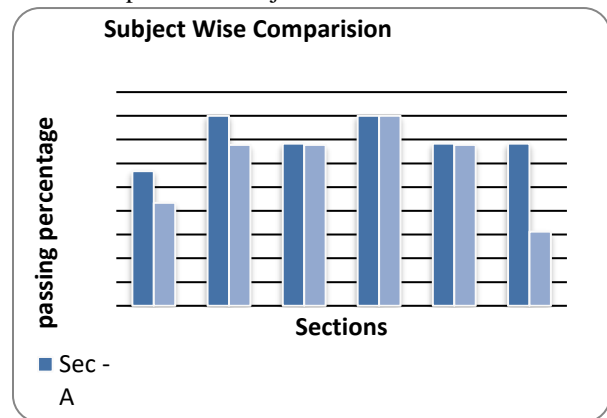


Figure 6. Subject-wise Bar Graph Representation

On the basis of the input sheet system is able to generate a report calculating the number of students appeared for exam and their average expected marks taking absentees, UFM cases and detained list into existence.

Inderprastha Engineering College Information Technology					
GRAND AVERAGE SUBJECT WISE					
Year	S.No.	Subject Code	No of Students	Total Marks	Avg marks pre subject
3rd year	1	RAS 401	84	3081	36.68
3rd year	2	RVE 401	84	3265	38.87
3rd year	3	REC 406	82	3477	42.4
3rd year	4	RCS 401	84	3422	40.74
3rd year	5	RCS 402	84	3005	35.77
3rd year	6	RCS 403	84	2903	34.56
<b>Total</b>			<b>502</b>	<b>19153</b>	<b>38.17</b>

Figure 7. Analysis Outcome

A process or a set of steps is followed to carry out the prediction phase as follows:

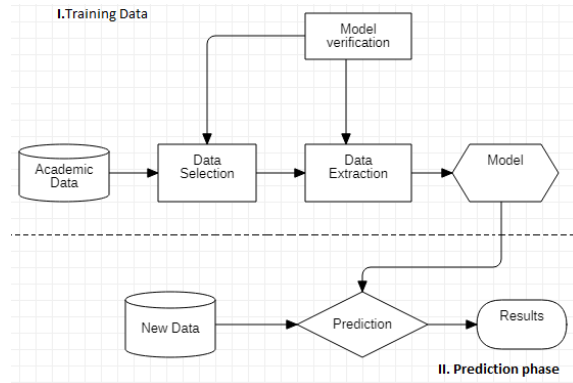


Figure 8. Prediction Work Flow

R.No.	Predicted Percentage
1703013001	77
1703013002	54.4
1703013003	48.4
1703013004	43.5
1703013005	60.7
1703013006	49.5
1703013007	65.5
1703013008	63.3
1703013009	58
1703013010	56.9
1703013011	51.6
1703013012	45.8
1703013013	60.6
1703013014	57.7
1703013015	56.5
1703013016	51.4
1703013017	53.2
1703013018	53.5
1703013019	56.4

Figure 9. Prediction Outcome

### VII.FUTURE WORK

Now, the developed System is desktop-based, it gives all the student details. In the future, the results can be directly printed, and this functionality can be made available to the user. As in this system, we have to input the data through an excel sheet but in the future, we can extract the data from the PDF file. The future scope of this project is that the data for the result can be directly extracted from the respected website and more features can be added to this desktop application like attendance. This can also be enhanced by giving the user more services such as aggregate calculation, portal management, dashboard registration, etc.

### VIII. CONCLUSION

After overall analysis of every positive point including

### IX. ACKNOWLEDGEMENT

all the corner cases and constraints over the component, it can be properly concluded that the product is a GUI-based component performing its entire task efficiently. This desktop application is working perfectly and verifying all user requirements. A data analysis technique and Machine Learning algorithm are applied in this project to ensure the prediction of the student performance is possible. This component can be easily plugged into many other systems. The system assists professors to identify and predict the students fail in the specified course or semester. SRMS assists users to retrieve information about their student’s performance throughout the semesters. I would like to extend my gratitude to the mentor, administration staff members, and all the faculty members of the department for their kind assistance and cooperation in assisting me in the collection of student data and carrying out the objective. Their sincerity, thoroughness, and perseverance have been constant sources of inspiration.

### REFERENCES

- [1] intechopen, “Ferda Unal”, (March 28, 2020). [Online]. Available: <https://www.intechopen.com/books/data-mining-methods-applications-and-systems/data-mining-for-student-performance-prediction-in-education>.
- [2] pdfcoffee, “IFTM University”, (2019). [Online]. Available: <https://pdfcoffee.com/student-result-management-system-project-reportdocx-3-pdf-free.html>.
- [3] researchgate, “Mohammad Gulam Lorgat” (October 2018). [Online]. Available: [https://www.researchgate.net/publication/318215858\\_Web-Based\\_Student\\_Result\\_Management\\_System](https://www.researchgate.net/publication/318215858_Web-Based_Student_Result_Management_System).
- [4] ijecs, “Vol. 6 No. 1”, (January 2, 2017). [Online]. Available: <http://www.ijecs.in/index.php/ijecs/article/view/2081>.
- [5] phpgurukul, “phpgurukul.com,” phpgurukul, (April 10, 2014). [Online]. Available: <https://phpgurukul.com/student-result-management-system/>.
- [6] pmi, “Gumz, J. & Parth,F.R.”,(2007).[Online]. Available:<https://www.pmi.org/learning/library/results-based-monitoring-evaluation-projects-7394>