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Automation and Digitization of School using Web Application and Cloud Storage

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Abstract: *In today's world every sectors are undergoing digitization including banking, healthcare, government, retail shops etc. But educational institutes still using paper method to store the data of students and staff. Also for prediction of academic performance of students institutes using traditional methods. In our work we developed a web application for administration section of educational institute through which every data related to students are stored in cloud storage to achieve digitization. Data collected from this web application is used to predict academic performance of students using WEKA tool and machine learning techniques. Results show that our developed application is cost effective and reliable with high accuracy.*

Keywords: *Machine learning, cloud storage, data mining, web application and digitization.*

I. INTRODUCTION

Conversion of any information into a digital format is known as digitization. Digitalization is the way toward altering information into a digital pattern, in which the information is sorted out into bits. The result is the representation of an object, image, sound, document or signature by means of creating a sequence of numbers that describe a discrete arrangement of its points or samples. The result is called digital portrayal or, all the more exactly, a digital image, for the object, and digital structure, for the sign. The digitized data is as binary numbers, which rearrange computer preparing and different tasks. Digitizing just methods the change of simple source material into a numerical organization; the decimal or whatever other number framework that can be utilized. Digitization is of crucial hugeness to data handling, storage and transmission, since it "permits information of numerous sorts in all arrangements to be conveyed with a similar proficiency and furthermore intermixed". In contrast to simple data, which normally endures some loss of quality each time it is duplicated or transmitted, digital data can, be transmitted with definitely no hardship. In today's world every sectors are undergoing digitization including banking, healthcare, government, retail shops etc. But educational institutes still using paper method to store the data of students and staff. Also for prediction of academic performance of students institutes using traditional methods. In our work we developed a web application for administration section of educational institute through which every data related to students are stored in cloud storage to achieve digitization. Data collected from this web application is used to predict academic performance of students using WEKA tool and machine learning techniques. Results show that our developed application is cost effective and reliable with high accuracy.

To design web application we used bootstrap framework which is suitable for both computers and mobile phones. Using HTML, CSS, Javascript web applications designed. Data entered by faculty is stored in cloud storage. Once data is collected then using WEKA tool data analysis is done to predict the result of student.

II. RELATED WORK

Now the distance educational resources in rural primary and middle schools can't meet rural teachers' teaching needs in practice, and at the same time it is difficult to organize and manage large amount of resources for rural schools without a good resource management system. In paper [1] authors provided that constructing school-based resources based on distance educational resources according to rural teachers' teaching needs and developing a school-based resource total management system can solve the problems effectively [1]. In [2] authors developed an e-School Management System (e-SMS) is mainly developed to make possible teaching and administration staff to handle school activities in high schools and parents/teachers to have in-time/reliable information regarding the performance of their child/student. In this paper conceptual model of an e-school management system and give details the functionality of an e-SMS and advantageous of electronic management. Different aspects of the design, development and evaluation of the School Assets Management System were presented in [3]. The system developed was based on the requirements of primary schools in Cyprus with the aim to handle their assets effortlessly, effectively and efficiently. After testing the system and implementing changes that have been suggested the end users recommendations, the system is ready to undergo a pilot operation phase and beta testing [3].

In [5] authors developed a EDM which is used to predict results of students. In this research authors used different machine learning techniques for early prediction of results of students. Five different classes of machine learning algorithms (MLA) are applied on data set. It is found that after applying these machine learning techniques accuracy of results predicted more.

In [6] authors taken a case study of big data analytics. Authors applied data analysis techniques on fertilizers requirement and availability and then based on that they predicted which fertilizer is more demandable in upcoming days. The same technique can also be applied for student results analysis. Data can stored in cloud and then that data can be used for analysis purpose. In paper [7] authors developed a client-server model in which client gives data in form queries and then server or also say cloud storage provide responses based on data stored within it. This method can also be applied on web application where data can be stored in cloud storage and can retrieved whenever necessary.

III.OBJECTIVES OF PROPOSED WORK

- A. Digitization of school records and hence making paper free school administration.
- B. Growing awareness of technology in non-technical institutes.
- C. Making teachers, students and parents to be a part of this system.
- D. To achieve Hostel, school fees, transport management, SMS intimation, online payment, library management, student results, students records, staff records, staff leave management, attendance system digitally.
- E. Predict student academic results using machine learning techniques.

IV.SOFTWARES REQUIRED

For this project work we used following softwares which are available for free of cost. Using these softwares a web application is developed and also student result prediction performed.

- A. Wamp Server
- B. Google Chrome
- C. Dreamweaver
- D. Adobe Photoshop
- E. Notepad++

Following languages are used to design web application and student result prediction.

- 1) HTML
- 2) CSS
- 3) JAVASCRIPT
- 4) PHP
- 5) MYSQL
- 6) PYTHON

V. RESULT ANALYSIS

- A. Below figure shows secure login for web application. For authorised persons login ID and passwords are provided. Using those login Id and password he/she need to login to applications in order to store data related to students in cloud storage.



Fig. 1 Secure login to web application

B. Once user login success fully into web application portal, then user gets different types of options like add students, add staff, modify data of student, delete student etc. Once student details are stored into cloud storage through this application, then user is enabled for data entry like marks obtained in different exams, other activity marks in the form of grades. Fig. 2 and fig. 3 shows the marks and additional activity grades entry portal respectively.

Marks Entry Portal [Term - 1] [Grade - 4]

Entry	ENGLISH			KANNADA			HINDI			EVS			MATHS			SST								
	NB-1	SE-1	HY	PA-1	NB-1	SE-1	HY	PA-1	NB-1	SE-1	HY	PA-1	NB-1	SE-1	HY	PA-1	NB-1	SE-1	HY					
Entry	5	5	77	20	5	5	78	20	5	5	75	15	5	5	53	20	5	5	75	17	5	5	49	
RI	17	5	5	59	20	5	5	76	19	5	5	68	12	5	5	46	19	5	5	76	14	4	5	45
OLI	13	5	5	45	16	5	5	58	18	5	5	60	9	4	5	35	19	5	5	74	11	5	5	42
V	8	4	3	42	16	4	5	52	19	5	5	57	9	4	5	40	18	5	5	58	12	4	4	41
DI	17	5	3	76	20	4	3	65	19	3	5	75	13	5	5	47	18	5	5	71	16	5	5	61
NI	12	5	5	58	16	4	5	45	16	5	5	47	11	5	5	41	20	5	5	70	13	5	5	43
NI	13	5	5	60	16	4	4	52	18	5	5	55	10	4	5	38	18	5	5	55	13	4	5	40
R	11	5	4	40	19	5	5	72	18	5	5	78	12	4	4	45	18	5	5	60	13	4	4	37

Fig.2 Marks entry portal

Part 2 & 3 Grades Entry Portal [Term - 1] [Grade - 3]

Info	Part - 2 : Co - Scholastic Activities (3 Point Scale)			Part - 3 : Discipline
	Work Education	Drawing	H & P Education	Discipline
Student Name				
II				

Fig. 3 Additional activity grades entry

C. Once marks and other activity grades are entered into cloud storage user can analyse data using any data analysis tool. In our work we have used WEKA tool to analyse data. User can also download marks cards and other consolidated marks sheets. Fig.4 shows consolidated marks sheet which is entered by user.

SUBJECT - ENGLISH					SUBJECT - KANNADA					SUBJECT - HINDI					SUBJECT - MATHS					SUBJECT - SCIENCE					SUBJECT - SST										
PA	NB	SE	HY	TOTAL	Grade	PA	NB	SE	HY	TOTAL	Grade	PA	NB	SE	HY	TOTAL	Grade	PA	NB	SE	HY	TOTAL	Grade	PA	NB	SE	HY	TOTAL	Grade	PA	NB	SE	HY	TOTAL	Grade
4	5	5	27	41	C2	5	5	5	28	43	C2	4.5	5	5	41	55.5	C1	4	4	4	27	39	D	4	4	5	27	40	D	5.5	3	5	27	40.5	D
8	5	5	69	87	A2	10	5	5	70	90	A2	10	5	5	80	100	A1	8.5	5	5	61	79.5	B1	9.5	5	5	68	87.5	A2	10	5	5	55	75	B1
6	5	5	30	46	C2	8.5	5	5	48	66.5	B2	10	5	5	63	83	A2	9.5	5	5	69	88.5	A2	5	5	5	27	42	C2	8	5	5	27	45	C2
8	4	5	65	82	A2	10	5	5	79	99	A1	10	5	5	77	97	A1	9.5	5	5	67	86.5	A2	8	5	5	58	76	B1	9	5	5	48	67	B2
9.5	5	5	77	96.5	A1	10	5	5	77	97	A1	10	5	5	77	97	A1	9.5	5	5	80	99.5	A1	9.5	5	5	76	95.5	A1	9.5	5	5	55	74.5	B1
3.5	5	5	27	40.5	D	5	5	5	27	42	C2	9.5	5	5	38	57.5	C1	6	5	5	27	43	C2	5	4	5	27	41	C2	4	5	5	27	41	C2
8.5	5	5	66	84.5	A2	10	5	5	68	88	A2	10	5	5	76	96	A1	10	5	5	78	98	A1	10	5	5	73	93	A1	9.5	5	5	49	68.5	B2
3.5	5	3	27	38.5	D	3.5	5	5	27	40.5	D	8.5	5	5	53	71.5	B1	7.5	5	5	44	61.5	B2	3.5	5	5	33	46.5	C2	8	5	5	27	45	C2
3.5	5	3	36	47.5	C2	7	5	5	27	44	C2	10	5	5	48	68	B2	7.5	5	5	37	54.5	C1	3.5	5	5	31	44.5	C2	7	5	5	28	45	C2
6.5	5	4	40	55.5	C1	10	5	5	73	93	A1	10	5	5	67	87	A2	6	5	5	27	43	C2	7	3	5	40	55	C1	9	3	5	27	44	C2
3.5	5	3	27	38.5	D	3.5	3	3	27	36.5	D	3.5	5	5	27	40.5	D	3.5	3	3	27	36.5	D	3.5	3	3	30	39.5	D	3.5	3	3	27	36.5	D
8.5	5	5	66	84.5	A2	9.5	3	5	57	74.5	B1	10	5	5	79	99	A1	10	5	5	76	96	A1	10	5	5	70	90	A2	10	4	5	49	68	B2
9	5	4	68	86	A2	9.5	5	5	70	89.5	A2	9	5	5	75	94	A1	10	5	5	80	100	A1	10	5	5	77	97	A1	9.5	4	5	72	90.5	A2
7.5	5	5	32	49.5	C2	8.5	4	5	36	53.5	C1	10	5	5	70	90	A2	9	5	5	76	95	A1	7.5	4	5	28	44.5	C2	7	4	5	39	55	C1
3.5	3	3	27	36.5	D	3.5	4	3	27	37.5	D	4.5	5	5	27	41.5	C2	3.5	5	5	27	40.5	D	3.5	3	3	27	36.5	D	6	3	3	27	39	D
9.5	5	4	58	76.5	B1	9	5	5	55	74	B1	10	5	5	79	99	A1	9	5	5	70	89	A2	9	4	5	65	83	A2	9.5	5	5	50	69.5	B2
8	5	5	73	91	A1	9.5	5	5	65	84.5	A2	10	5	5	79	99	A1	10	5	5	77	97	A1	10	5	5	79	99	A1	10	5	5	72	92	A1
10	5	4	66	85	A2	10	5	5	73	93	A1	10	5	5	80	100	A1	10	5	5	80	100	A1	10	5	5	78	98	A1	10	5	5	65	85	A2
5.5	5	4	46	60.5	C1	10	5	3	61	79	B1	10	5	5	75	95	A1	9.5	5	5	69	88.5	A2	8	3	5	40	56	C1	8.5	3	5	34	50.5	C2
3.5	5	3	27	38.5	D	6.5	5	3	48	62.5	B2	9	5	5	29	48	C2	3.5	5	5	31	44.5	C2	6	3	3	27	39	D	5	3	3	27	38	D
6.5	5	4	54	69.5	B2	10	5	5	65	85	A2	10	5	5	80	100	A1	10	5	5	76	96	A1	10	5	5	66	86	A2	10	5	5	51	71	B1
6	5	4	27	42	C2	9.5	5	5	48	67.5	B2	7.5	3	5	43	58.5	C1	10	5	5	79	99	A1	7	3	3	36	49	C2	7	3	3	36	49	C2
8.5	5	4	56	73.5	B1	8.5	5	5	28	46.5	C2	10	5	5	71	91	A1	9	5	5	68	87	A2	10	5	5	80	100	A1	9	5	5	37	56	C1
3.5	4	5	27	39.5	D	8.5	4	5	28	45.5	C2	9.5	5	5	70	89.5	A2	6.5	4	4	66	80.5	B1	3.5	3	5	27	38.5	D	3.5	3	5	27	38.5	D
4	5	5	27	41	C2	8.5	5	5	55	73.5	B1	10	5	5	76	96	A1	7.5	5	5	68	85.5	A2	4	3	5	31	43	C2	4	5	5	27	41	C2
9.5	5	5	63	82.5	A2	10	5	5	59	79	B1	10	5	5	77	97	A1	10	5	5	79	99	A1	9	4	5	80	98	A1	9	3	5	51	68	B2
5	5	4	34	48	C2	9	5	5	57	76	B1	10	5	5	75	95	A1	8	5	5	67	85	A2	7.5	3	3	61	74.5	B1	6.5	3	3	42	54.5	C1
4.5	5	4	30	43.5	C2	8	4	5	41	58	C1	10	5	5	63	83	A2	8.5	5	5	39	57.5	C1	4.5	4	5	39	52.5	C1	7	3	3	30	43	C2
5	5	5	33	48	C2	9.5	5	5	49	68.5	B2	9.5	5	5	67	86.5	A2	9.5	5	5	72	91.5	A1	8.5	4	5	56	73.5	B1	8	5	5	43	61	B2

Fig. 4 Consolidated marks which are entered by user

D. Once data is stored is stored in cloud storage can be accessed at any time and can be analysed. Fig 5 and fig.6 shows the analysed data for student information data set using WEKA software.

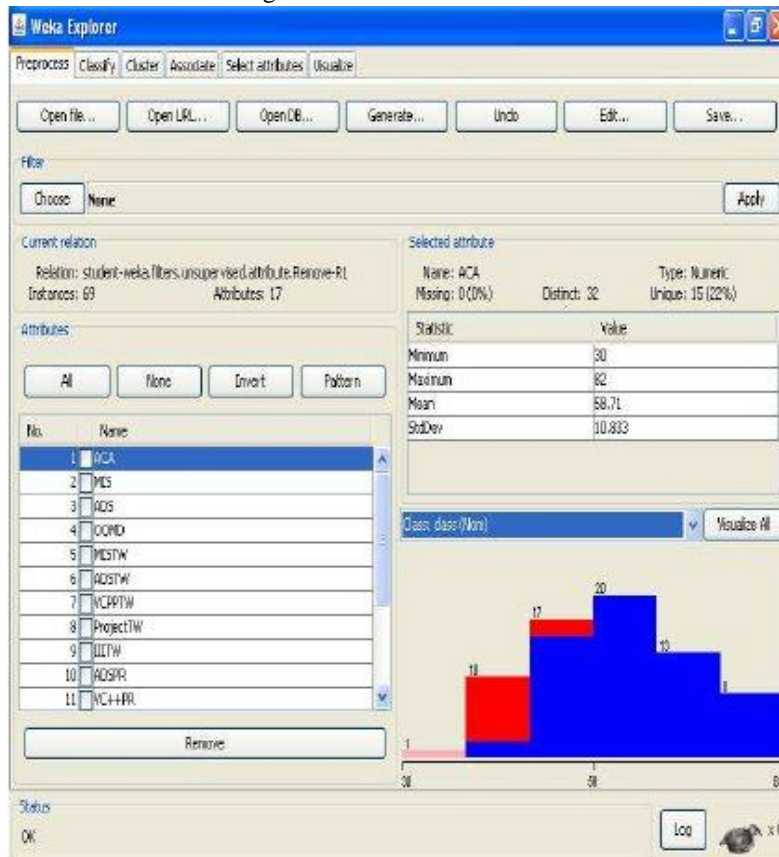


Fig. 5 Weka Explorer window with Student dataset

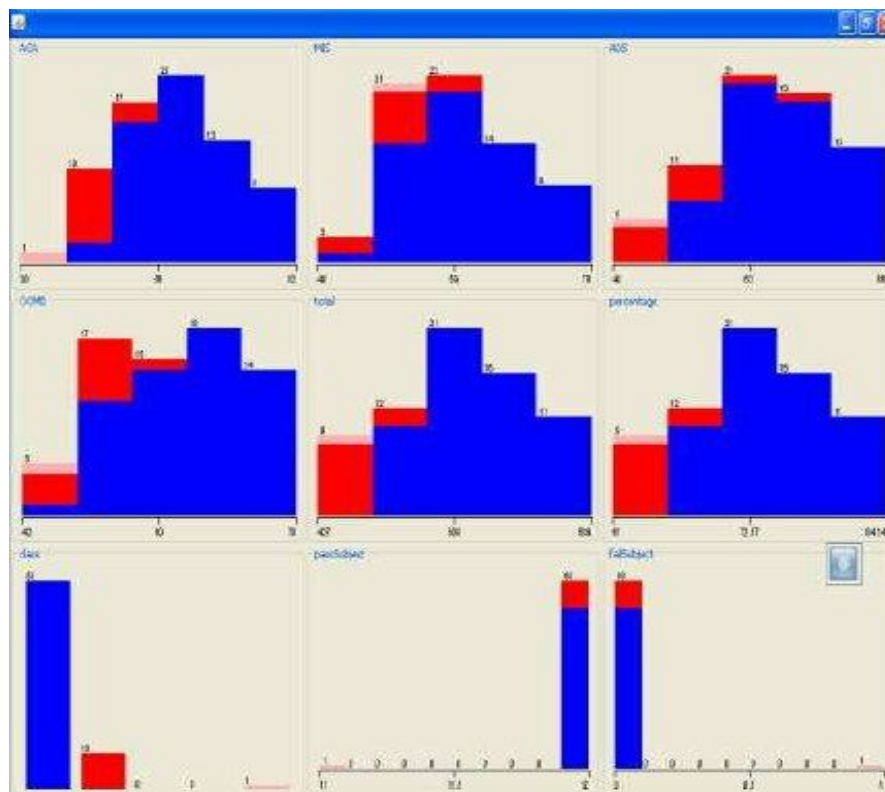


Fig. 6 WEKA results panel

VI. CONCLUSIONS

As in today’s digital like every other sector, educational sector must undergo for digitization. In our research work we have developed a web application for school through which every data of students including personal data and marks obtained in different exams are stored in cloud database. Since the data are stored in cloud user can access data of student remotely. Pen and paper method for documentation can be completely eliminated. Data which is stored in database can be analyzed using machine learning techniques in WEKA software. Presented work confirms results are more reliable and accurate.

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