

PROCEEDING



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Online Classroom Attendance System Based on Cloud Computing

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Keywords: Classroom Attendance, RFID Reader, Cloud Computing, Database

Abstract: Attendance of students in the classroom is one of mark representation of total marking after finish the end of class, some of the students are cheating they are attendance while manual system by sign in the form of attendance. Furthermore, manual attendance is ineffective way while digital technology is available and widely used nowadays and waste of papers. This research discusses on automatic attendance system for students and lecturers, where every student before entering classroom have to tap their student card on RFID reader and before out need to tap as well. Duration of time set as tolerance of lately as well as for early out of the classroom. Similar to students, every lecture required to tap as well before and after teaching in a classroom, besides that lecturer required to hold his card on RFID reader to on electricity in the classroom else no electricity and no power in the classroom. The data of students and lecturer attendance with room number is set and send to a database for student's attendance and honorarium for lecturer. This system tested in a classroom of Faculty of Engineering, Islamic University of Riau with the number of students 40 people. Data collected by RFID reader passed to the cloud server which controls by University information technology and connects to the payroll system in the finance department. The system gives effective and efficiency in administration, while no more manual record as well as clerk, do not need to summary lecturer attendance at the end of the month for an honorarium. Paperless and efficiency for staff to control and manual attendance is one of the advantages of this system, and also students and lecturer unable to cheat their attendance in double class teaching at the same time.

1 INTRODUCTION

Classroom teaching is a common method that currently applying by most the academic institution including in school and colleges. The conventional method by having manually signed the attendance in a sheet of paper then passed around the classroom while lecturer conducts the teaching in the classroom is wide implements nowadays. This method could undoubtedly allow the students to do cheating about their attendance in the classroom, where a student may sign for an absent student. In addition, the help form can easily be lost or lost during circulation. A more rigorous approach, especially to prevent students from cheating on their attendance, is also boring, where a teacher tells each student's name based on a list of student names and validates each student's attendance. It has been proven that the form of a manual method for bringing student attendance is difficult and time-consuming to verify each student. Without control, whether confirmed students respond or not, consolidated attendance calculations are another important task that can cause manual errors.

In some other cases, attendance sheets may be lost or stolen by some students. The consequence of such a problem with attendance notes on paper has made it stressful and ineffective, especially in large classes. As a result, there is a need to find new and modern ways to track and manage student attendance records at higher academic learning institutions more efficiently and effectively.

Therefore, it is very important to develop an assistance system that is equipped with an online database, especially to prevent data loss, as well as to promote ecological and paperless and ecological technology campaigns. In addition, this application will help reduce time wasted, which will lead to greater learning productivity in the classroom. Several paperless assistance systems have been developed, but they must be equipped with a computer or RFID reader, which incurs additional costs for hardware and can result in maintenance. With that in mind, our goal is to overcome this problem by having a system with minimum hardware requirements and, at the same time, enhancing the mobility aspects of the existing support system.

Furthermore, to overcome such troubles as mention in the above discussion, the required of automated attendance system is required for system management. Many way and technique are available as the basic concept of the system. In this system proposed an automatic student and staff (lecturer) attendance system, where RFID reader installed in every classroom and assign with an identity for identification of what classroom used.

2 RELATED WORKS

This section discussed on several works have been done on previous research conducted. Some of previous works review related systems and student different for the methods in record student's attendance. The use of android based system for students attendance as discussed in (Noor et al., 2015) where the application installed then can be download the students list from a designated web server. Refer to students attend in the classroom after their scan the card to Radio Frequency Identification (RFID) reader (Evizal et al., 2012). Additional of device such as cameras used to support the system information and student's attendance confirmation. Another research discussed on this attendance system which elaborate in (Varadharajan et al., 2016) describe the students attendance without human interference. The used of camera as a method to fix in the classroom and will capture the image when every student going into room, the faces of students are detected and then recognized and match to the database and finally the attendance of student is marked. If the attendance is marked as absent the message about the student's absent is send to their parents.

The others research is developed student attendance system used a fraction of the classroom for participation points and lead the students' attendance list into a preset teaching system such as attendance by checking every student, random questioning based on the list, and quiz. Similar to the ladder ranking system that widely used in current online computer games, students can check their ranking of accumulated absence and points in the end of class as a long term stimulus for study. (Debiec, 2017; Gunawan and Kadir, 2017; Xiao et al., 2018).

The traditional student attendance system required physically sign the attendance sheet every time conduct lecture in the classroom. This method is unnecessarily time consuming to notice and mark student's name on the attendance sheet. This is happening that some students may accidentally mark the others student name or willingly to do

it. Normally, the hard copy of attendance sheet after a few weeks may get lost or easily get messy. Used of smartphone such android technology will help teacher to get student attendance easily by online system then be able to check percentage student attend the class as well to copy or print it. By using the stored information, teacher easily to mark student attendance, attendance percentage calculations, marking intruders' entry, send emails or send message to the parent to keep them updated about their child's attendance at the school or college (Islam et al., 2017; Tarimo and Hickey, 2016).

Online Biometric-enabled Class Attendance Register System (OBCARS) prototype elaborate by (Wei et al., 2017) develop and design to change of misplaced and torn attendance register form in various classroom in school or college. System used biometric fingerprint reader for every student before entry the classroom. While the (Wei et al., 2017) discuss on student attendance system used Near Field Communication (NFC) system. The solution be able to provides a traditional and mobile learning system for classroom to the school or college and university to enhance the interaction in the process of learning between the students and reduce the number workload given to the lecturers in summary of the attendance while in the clasroom (Kadir et al., 2016) All over previous research used normal online system then in this research proposed a new method of online system for student and lecturer pairing to make sure lecturer attend in the classroom as well. Beside that the use of cloud computing is one of additional feature in this system to make sure data of student's attendee can be access staff in everywhere. Student attendance information is very important is not only for classroom marking but for finance department to pay lecturer honorarium.

3 PROPOSED SYSTEM OF STUDENT ATTENDANCE

The proposed solution for online student attendance system uses several components and integration to become a system that is able to manage student's attendance. Difference to the current system that developed by other researchers, in this cloud computing has been used for data management system beside local server in an academic institution. Figure 1 shows diagram of the student's attendance system, where Arduino and RFID reader is the main unit for this system to control student and staff attendance.

Student and staff card occupied with RFID chip

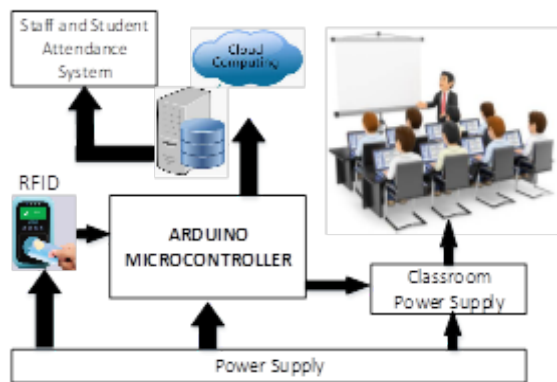


Figure 1: NumberBlock diagram of student attendance system.

which is Mifare 13.56 MHz and memory 1kB thus in this case users of the RFID reader to retrieve student or staff information by using an RFID system. Information stored in student card is limited, only the identity (ID) data stored with some information, this system designed to retrieve student ID information which is 9 characters same as to student matric number, as well as for the staff ID with 9 characters. Once ID of student or staff received by RFID reader then the information received in Arduino Microcontroller to compare to student or staff ID in database, this case student information linked to student academic management system, where every student as they are accountable for academic purpose, since the data and information available then attendance system only connected to the database without to set up a new database management system. Similar to student database, information of student classroom and schedule linked to the academic management system which every faculty have to manage lecture classroom, schedule, subject, time, and student registration the subject.

Figure 2 shows a flowchart of the attendance system that flows of the process in the system. All the information start from student scanning the card then system decide whether valid or information to process or not then make the decision of student attendance.

3.1 RFID

Radio Frequency Identification (RFID) is a technology based on wireless communication and Non-Line of Sight (NLOS) to retrieve information. Radio wave concept in RFID is able to collect information from the transponder (tag) to RFID reader, with advantages of this technology and more convenience for student attendance system thus apply in this system. Figure 3 shows a sample of student ID

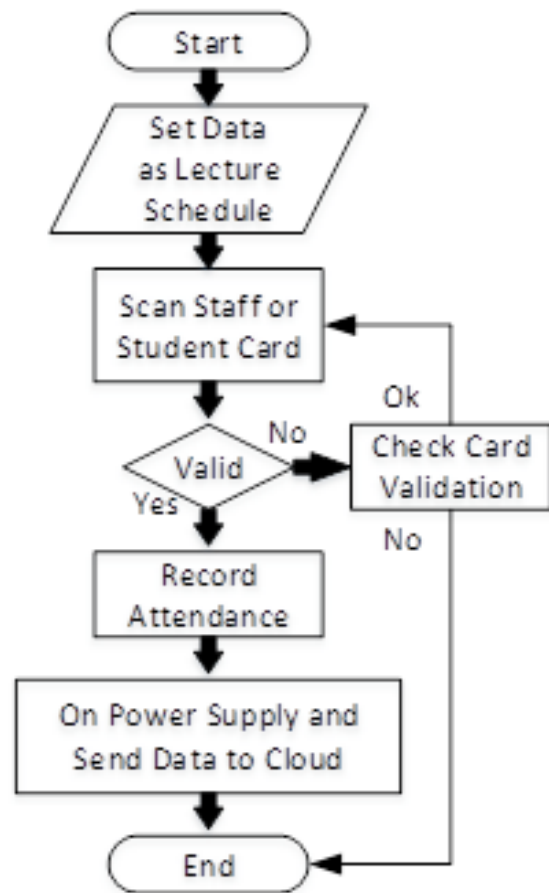


Figure 2: Flowchart of the student attendance system to process the information.

card used in this system with an emended RFID chip.



Figure 3: Sample of student ID card.

Similar to the student ID card, every lecturer and staff occupied with RFID chip in ID card as well, thus the process of data retrieve same as to student ID card. Figure 4 shows a sample of lecturer and staff ID card with an embedded RFID chip.



Figure 4: Sample of Lecturer and staff ID card.

3.2 Arduino

Arduino is a project based on an open source system that easy to use by the developer, hardware and software integrated system developed in a package. Currently, the Arduino module widely used in many application, thus in this attendance system used Arduino for microcontroller system. Figure 5 shows a picture of the Arduino module connected to an RFID reader to read and retrieve card information. All the information analysis and to be matched to the database as well as class schedule and verification then final information stored in the database. In order to be accessed by any party that required this information thus a cloud database setup to keep all the information.

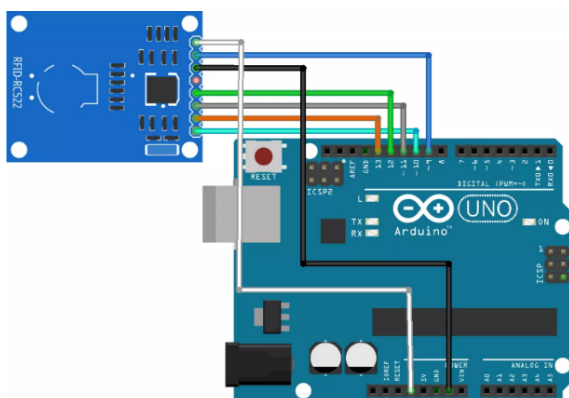


Figure 5: An Arduino module with RFID reader.

3.3 Cloud Computing

Cloud computing is a technology in computer science recently become an alternative to change from the local server to the cloud. The demand for availability system resources in a computer and especially for the storage of data and computing for power system without direct to a local server that manages by the user. The term cloud computing is in general used to describe data centres available to many users over internet access. Figure 6 shows a configuration of a cloud computing to be accessed by any user and the management system.

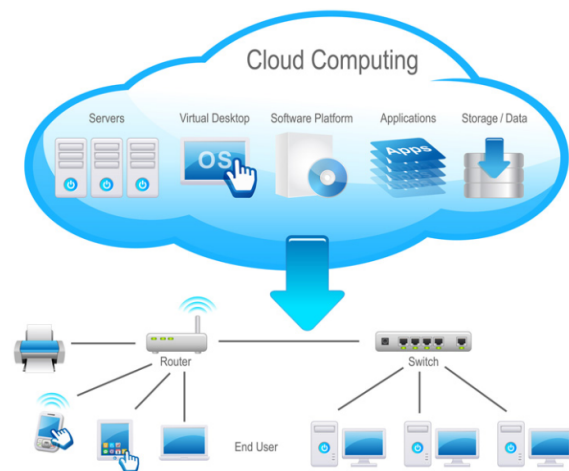


Figure 6: Configuration of cloud computing.

4 RESULTS AND DISCUSSION

Application of student attendance system has been developed and tested in the real classroom, some class of lecture tested with this system. Figure 7 shows a screenshot of student and lecturer attendance system in the classroom.



Figure 7: Application student attendance system.

In this case, an average of students in a classroom

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7/10/14

Photo	Full Name	Q. 01	Q. 02	Q. 03	Q. 04	Q. 05	Missing Q. 05
	Brown, Sam	1000000000	0%				
	Evans, LORIAN	1000000001	100%				
	Ellis, Dan	1000000002	00%				
	Garrett, Mike	1000000003	00%				
	LIAM, PAUL	1000000004	00%				
	Smith, Paul	1000000005	00%				
	Travis, Dan	1000000006	00%				

A report of student attendance system generated once lecture class finished, the report shows for every student in a classroom that attends the subject conducted by the lecturer. The report also recorded attendance for all the weeks, in this case, 16 weeks to complete a subject in a semester. Figure 9 shows a report sheet generated by this system.

Order Number	Name	Law	Birthdate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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All the information for every student and classroom including staff or lecturer conducted the lecture in classroom sent to the integrated database management system, the central database manages

5 CONCLUSIONS

ACKNOWLEDGEMENTS

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