

Intelligent Decision Supporting System to select grade one students for a school.

Sanduni Silva

University Of Moratuwa

silvamwsau.20@uom.lk

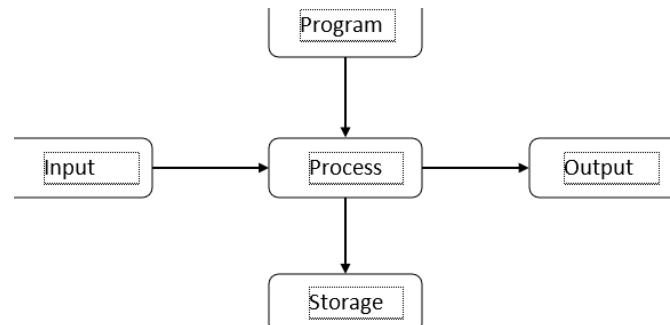
Abstract -This thesis proposes an intelligent decision support system for selecting children for grade one class for a school. Its goal is to improve the quality of the service and to reduce the disadvantages of the current system when applying for the admissions. Education is one of the most suitable fields to implement Intelligent Decision Supporting System. selecting students for the grade one classes, this whole process from applying to selecting students is done by using human labour from the past to now and in every stage one of the stakeholders from the above help the process to happened without any issues and interruptions. The current process has lots of cons. Mainly waste of time for both schools' and parents' side and this operation takes more than 9 months, and it is a considerable amount of time wastage. Since at present people have hectic and packed lifestyle, this process is not fit into them. Since nowadays the technology is developing day by day and education field and specially this applying and selecting children for grade one of a school is one of the best process that can use new technologies we can use Intelligent Decision Supporting System method to avoid happening these kind of mistakes and to reduce other disadvantages and to create a new technologically improved, easy and efficient way to do this process without involving huge number of staff and gain efficient process that everyone like and trust.

Keywords—IDSS (intelligent decision support system), education, applying for admissions.

I. INTRODUCTION

A. Introduction

A system is a group of components or tasks that work and happened together to achieve a common goal [1]. An Information Communication Technology (ICT) system can be defined as a group of components such as hardware, software, firmware, liveware, data, communication methods like internet and so on which interacts together to achieve a common purpose [2]. The fundamental ICT system can be shown as follows.



With the time, ICT systems become more complicated like Decision supporting systems, remote learning platforms, coding software and so on. Decision Supporting Systems (DSS) are used in vast variety of fields at present like, banking, education, health, businesses etc. A DSS is a computer-generated program which helps an organization to take decisions, judgements and certain actions about a relevant area with the help of deep analysis done by the DSS using large bulks of data and information. These analyzes lead the decision makers to make decisive decisions to solve problems [3]. This DSS is not a typical type of program which is there only to collect data. Some of these DSSs can be fully computerized, powered by humans and at the same time there can be DSSs which are run with combination of both ICT and humans [3].

Intelligent Decision Supporting System (IDSS) is the next phase of DSS. When DSS combine with Artificial Intelligence to have the abilities of intelligent thinking behavior of humans, it can be called as an Intelligent Decision Supporting System. In an Intelligent Decision Supporting System, DSS does the analyzes using massive amounts of data. And the role of humans, the decision-making part is done by Artificial Intelligence (AI) that include in Intelligent Decision Supporting System. So the Intelligent Decision Supporting System does the whole process without involving humans. There are lots of advantages of Intelligent Decision Supporting System rather than using a typical program which only can be used to input data and do few calculations. Efficiency is one of the most highlighted pros in Intelligent Decision Supporting System. Except that, Intelligent Decision Supporting System generates timely and accurate decisions without biased to anyone.

B. Purpose of research

Education is one of the most suitable fields to implement Intelligent Decision Supporting System. When it comes to schools in Sri Lanka, almost all the schools use human labor to do the daily process and management of the schools. In schools every single decision have been taken by the management so, Sri Lankan schools are one of the places where use minimum

technology and because of that most of the office staff and teachers are lack of knowledge and practical side of technology. Since schools mainly provide a service, it is not accurate and can not change every process into a system or a computer program. For an example, teaching. At present there are lots of ways to study by using technology but to provide better and quality education schools need teachers so, all the processes and operations of a school can not be computerized. Even though there are some limitations like that, most of the other administration processes can be automated and computerized. Due to these typical processes done by employees in a school, most of the time they spend lots of money to pay wages to the people who are working with data and analyze the information that helps top management to take decisions even they are not that much hard and costly things to do if they have an Intelligent Decision Supporting System. Since we can not see any highlighted technological changes and adaptations in school chain, this type of research is needed to study about the environment of Sri Lankan school chain and to implementing new systems and do changes with the help of new technologies.

II. BACKGROUND OF THE PROBLEM

When considering a school, it is a large organization which has lots of operations, systems and sub-systems. There are a large number of stakeholders, and they have massive amount of relationships with the school. In this research we choose one of the main operations that has done annually by the school which is selecting students for the grade one classes of the school. For this operation not only academic staff but also office staff, principals, children and also parents engage. This whole process from applying to selecting students is done by using human labour from the past to now and in every stage one of the stakeholders from the above help the process to happened without any issues and interruptions. Since this is one of the main operations in a school and normally schools use human labor to complete this operation, it becomes more complicated and not reliable. At the same time, since they can change these data and they may be biased to someone. It is a common secret that most of the parents have to bribe someone in the school to put their children into the school. And also this simple process gets much more complicated, and it leads to more time consuming, costly and lack of efficient. Not only from the school side but also the parents may have to face inconveniences due to the complications in this system.

The current process of applying and selecting children to grade on class is start when schools open the admissions. Generally, these admissions are open from mid of April to end of June every year. The further process is happening as follows:

1. Parents should get the admission forms either from websites of the relevant schools if they are wishing to apply for a private or semi-government school or through the website of Ministry of Education to apply for a government school.

(The admission form to apply students for government schools - 2022 intake is linked here. [2022 intake - admission form](#))

Sometimes, the application forms are not available in the school websites, if so, parents need to go to that school and collect an application form.

2. After they fill all the relevant areas of the application form, they have to register post all the application forms to each and every school. This process is same to all type of schools even it is a government school or a semi or private school.
3. From this step onwards it is a responsible of the school to manage the process. Here, the office staff of the school collect all the application that they get till the deadline date. Then they have to open all the application letters and record the bio data and all other important data of each and every the applicant in a book or a database.
4. In Sri Lanka, all the governments schools and most of the private and semi-government schools offer various categories to apply for the grade one of school. Following are the categories and the weight for each category that related to a government school:
 - Children of residents in close proximity to the school (50%)
 - Children of past pupils (25%)
 - Brothers/ sisters of students studying in the school at present (15%)
 - Children of persons belonging to the staff in an institution directly involved in school education (05%)
 - Children of officers transferred on exigency of government service/ on annual transfers (04%)
 - Children of persons arriving after living abroad with the child (01%)

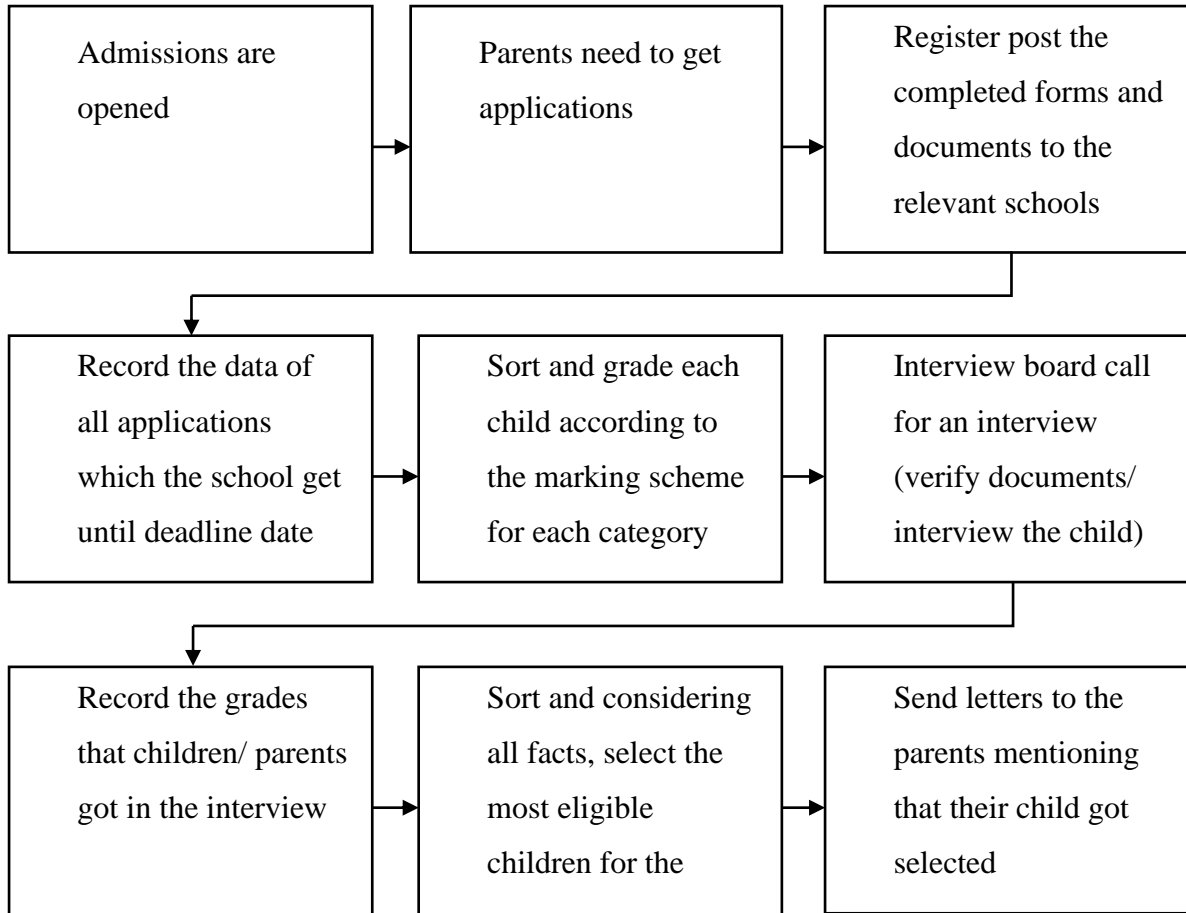
All the children get marks according to the categories which their parents applied the application form and rank according to that by the interview board of the school with the help of office staff. This is a huge process since all the sorting and gradings have to do by themselves and there is a particular marking scheme and su-marking schemes for grading and also in general, one school have to grade more than 400, 500 applications. If it is a famous school, then it may be even 1000 applications or more than that.

5. After that step the interview board send letters to parents inviting to an interview. There is a slight difference between the interview process of a government school and a private/ semi-government school.
The interview process of a government school normally held to verify the documents which sent by the parents to know the purpose and do some clarifications about from the parents.
The interview process of private/ semi-government school is interviewing the child before the start of selecting process. Since parents do not require to send documents like proof of place of living and all, there is no need to verify documents like that. In this process members of the interview board talk with the child and give some tasks to do. According to that they grade the performance of the child and add the marks under that child's total grade.
6. When the sorting and grading process has been completed, then they have to select the children who got highest marks according to the available quota of the school, out of all applicants. Then the interview board

should send letters to the parents of the children who got selected for the grade one class of that school.

This is the normal process of applying and selecting children for grade one class of a school. This process can be shown in as a process model like follows:

Diagram 1 Current process



III. OBJECTIVES OF THE RESEARCH

The main purpose of this research is to identify whether all the stakeholders like children, administration, staff and parents want to change this system. Mainly the applying and selecting process of students for grade one of a school is more complicated than we think since almost all the steps, data entering to sorting, grading and selecting is done by a group of people.

The current process has lots of cons. Mainly waste of time for both schools' and parents' side and this operation takes more than 9 moths, and it is a considerable amount of time wastage. Since at present people have hectic and packed lifestyle, this process is not fit into them.

Due to this time wasting, the efficiency of the process is lower, and it is not effective since this process needs a large amount of human labour to complete it. Since there are highest number of humans involving in this process, the briberies, corruptions, and being biased are common things that can be happed. And also, there are opportunities to make mistakes like repeat the same data, enter wrong records or miss some of the data when

entering and etc. These types of mistakes are common when a process is done by manually.

Since nowadays the technology is developing day by day and education field and specially this applying and selecting children for grade one of a school is one of the best process that can use new technologies we can use Intelligent Decision Supporting System method to avoid happening these kind of mistakes and to reduce other disadvantages and to create a new technologically improved, easy and efficient way to do this process without involving huge number of staff and gain efficient process that everyone like and trust.

IV. MATERIALS AND METHODS

Since the new process and the method of the process is not implemented for real, a hypothesis was created and it is people want a newly designed, effective Intelligent Decision Supporting System except the typical manual process of applying and selecting children for grade one of a school.

The newly designed method and the Intelligent Decision Supporting System is completely different from the current method. In an Intelligent Decision Supporting System method almost all the steps of the process have been done by the Intelligent Decision Supporting System and only one or two steps involve a few people since examine or interview another person and make decision is can not done by a machine. The new Intelligent Decision Supporting System method can be described as follows.

First of all, every school which has a primary section should have their own website. Since Intelligent Decision Supporting System collect data by its own, the websites will be the source to collect those data. So, every school either government or private they need to use the website to publish the application form. And then the process is started as follows under Intelligent Decision Supporting System.

1. First and foremost, every school have to publish their admission form on their websites. This is for all schools including government schools. Even though private/ semi-government schools have their own admission forms, government school have to use the same format for admission form. So, government schools can publish the admission application under the relevant application format issued by the government.
2. The next step is both government and private/ semi-government schools should allow parents to fill the form. For that they can use their website as a portal to apply for the admissions. This is where the Intelligent decision supporting system collect data. When parents fill the application through website, the details of the child, parents and all other information automatically save in a specific data base that create for this admission process. This is different and there is no connection between the student data base of the particular school. This data base

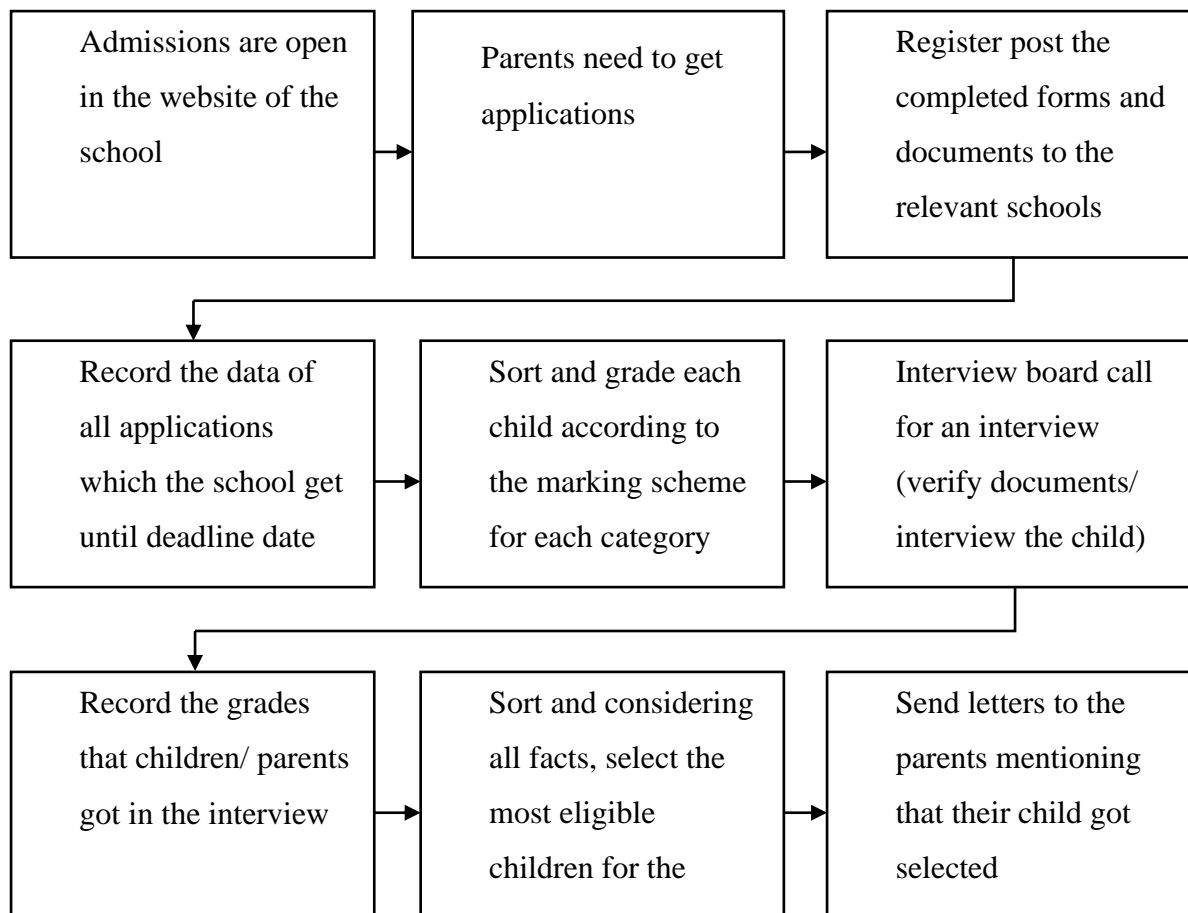
is a temporary one and when parents edit the applications, then the recordings of the data base also update automatically.

3. The portal to apply for the school will be opened till the deadline date and on the deadline date the portal will be automatically closed and after that no one can not apply for admissions. In here since there can be some circumstances where administration of the school decides to extend the date of deadline. In case like that, the people who are allowed to access to the system either principal or members of the interview board can change the deadline date through the system.
4. After the deadline date, the temporary database will be automatically filled with the details of the children. Then the send phase of the system which is a specific programme designed to sort and grade the applications according to the some specific criterias. For all the government schools, this programme will be same but for the private/ semi-government schools this programme should be different since each school has different criterias when it comes to grade admissions.
5. When the programme runs, all the records of all children go through the programme one by one. Firstly, programme will sort the records into groups according to the given instructions and then programme will give grade to the children according to each category. For sort and grading process, all the instructions were coded according to the marking schemes and with the advices and needs of the administration of each and every school.
6. After this process the interview board need to send letters to each and every parents. For this, when members of the interview board type the letter in the system, it will automatically email the letter to every parent within few seconds mentioning about the interview. So, there is no need to waste time on posting letters at the same time, wasting money on papers, postal charges and so on.
7. Interview can not done by the system since the best way to interview and identify another human being is to interviewed by another person not a machine, system or a programme. But after interviewing one the member of the interview board can enter the marks that relevant person/ child gets from the interview into the system.
As mentioned earlier, in government schools they conduct the interview to verify the documents and if the documents are valid and true, they can give marks for the child according to the marking scheme and enter it to the relevant raw that is there in the data base under that child's ID.
When considering the private/ semi-government schools, they interview the children to examine the performance of each an every child who's parents send admissions. In this case, same as government schools, interview board have

to interview the child in a friendly manner and give marks for the children according to their performance in the interview and enter them into the data base at the same time.

8. After the interview process the data base is also updated since the members of the interview panel entered the marks or the grades that each and every child gained during the interview. Since the whole data base is up to date, then the second programme is ready to run. In this programme, all the applicants are being graded from highest to lowest by the system and make a list from most eligible child to least eligible child. Then using Artificial Intelligence and decision supporting system methods the system will issue a list of the children who has been selected for the grade one of the relevant school.
9. After the interview board and administration of the school confirm the list of students, then again system will email letters to the parents who's child were selected for the school.

Diagram 1 IDSS method



This is how the process done using the newly designed intelligent decision supporting system. There is no change in the primary process since there is no other way to apply for the admissions for grade one in a school. But the change is in the

method that used to complete the process. Current process use human labour to complete the process which has a lot of disadvantages while the newly designed intelligent decision support system will complete the same process by using new technologies like artificial intelligence, programming, decision supporting systems and so on which able to reduce and avoid all the disadvantages of the current process.

V. RESULTS

To verify whether the people actually want and like a intelligent decision supporting system like this, a questioner had been created and the results of that questioner shows that people want a new system or a method beside the current one.

(results of the questioner -

<https://docs.google.com/spreadsheets/d/1D-mxiAz6M7sRwjCwaItp8tioyVvZmaNrazjcTMbYFj8/edit?usp=sharing>)

The sample consists of parents who already apply for these kind of application for a school at least once in their lives and out of 39 parents only 3 people saying that they prefer the current method of applying for grade one admissions. There are three main reasons why those 2 parents saying that the current method is better and those are it is more easy than applying online, lack of knowledge to apply online and fear of making mistakes while applying via online mode.

All other 36 parents think the intelligent decision supporting system will be great due to the reasons like, easier that current mode, efficient, less time consuming, less likely to be biased when selecting the students, automatic data processing do not require a lot of paper works and so on.

When considering their own ideas that why they think intelligent decision supporting system will be better than the current one, answer that we got can be listed as follows.

1. When there can be a system where it consumes less time but provides productive results, it always will be very effective.
2. It will make for a quick efficient process that will not have any prejudices or judgement towards students.
3. The result of the system will be fair enough.
4. transparent and fair selection. Reduction of competency for popular schools. Standards of every school going to increase due to less competency.
5. Last year I also applied, even though my daughter got selected the process was really annoying, time consuming for most of the people who have busy schedules like us. So, it will be really good if there's a computer system to do this since it's easy and more trustworthy.
6. During covid 19 pandemic it was really hard to send the application letter to the school since post offices were close due to quarantine and curfews and also some parents said that some staff members of the school was tried to be biased when selecting applications. So, system like IDSS will be good enough to reduce these kinds of problems.
7. Current system is wasted time of office staff and parents.

8. Because it is easy and calculates the marks automatically so there will be no favoritisms affect marks of a child
9. In Sri Lankan typical selection system, there are so many misconducts such as being biased, taking bribery, etc. So, it will be good if this process was automated.
10. Existing process not provide equal opportunity to everyone

VI. DISCUSSION

According to the above results we got from the questioner it is crystal clear that almost all the parents do not want this current method of applying admissions. Most of them are highlighting the time wasting, costly, not efficient and effective and biased as reasons to reject the current method of applying applications. So, people want something that make their life much easier and that is why all of them want to change the current method to an intelligent decision supporting system where both parents and staff of the school no longer need to waste their time on data entering process to select children for the schools.

VII. CONCLUSION

Finally, it is confirmed that, the field of education need to adapt more and more technological improvements for their typical processes and operations since these operations are now expired and the stakeholders are not satisfied by them. They need changes and the ways to make the work easy. To achieve that, technological improvements is a must. At the same time, while there are easy ways to do things like using intelligent decision supporting systems, it is not a positive decision to waste resources by not changing the system.

VIII. ACKNOWLEDGMENT

I would like to thank my DA2310 (Management Information Systems) lecturer, Mr. Maneesha Caldera, for his encouragement, corporation throughout this assignment and giving us this opportunity to do this kind of project as our assignment since we learnt valuable things and got lots of experiences from this. I always grateful to my family, friends and everyone for their support to get responses for the questioners and everything.

REFERENCES

- [T. Contributor, "system," TechTarget Contributor, 1 2005. [Online]. Available:
] <https://www.techtarget.com/searchwindowsserver/definition/system>. [Accessed 05 05 2022].

["ICT systems and their usage," Bitesize, [Online].
2 Available:
] <https://www.bbc.co.uk/bitesize/guides/z2c82hv/revision/1#:~:text=An%20ICT%20system%20is%20a,part%20of%20an%20ICT%20system..> [Accessed 05 05 2022].

[T. SEGAL, "Decision Support System (DSS)," Investopedia, 03 01 2022. [Online]. Available:
] <https://www.investopedia.com/terms/d/decision-support-system.asp>. [Accessed 05 05 2022].

["Diabetes," 10 November 2021. [Online]. Available:
4 <https://www.who.int/news-room/fact-sheets/detail/diabetes>.
]

["Most diabetic country 2019 | Statista," 2022.
5 [Online].
]

["What is diabetes? | CDC," 02 March 2022. [Online].
6 Available: Centers for Disease Control and
] Prevention.

["Text Messaging in Healthcare," [Online]. Available:
7 <https://www.hipaajournal.com/text-messaging-in-healthcare/>.
]

[T. Rebane, "5 Unique Ways of Texting in Healthcare," 8 2021. [Online]. Available:
] <https://messente.com/blog/most-recent/how-to-use-sms-in-healthcare>.

["able: General Characteristics of Types 1 and 2 Diabetes Mellitus - MSD Manual Professional Edition," 2022. [Online]. Available:
] <https://www.msdmanuals.com/professional/multimedia/table/general-characteristics-of-types-1-and-2-diabetes-mellitus>.

["General Characteristics of Types 1 and 2 Diabetes Mellitus," 2022. [Online]. Available:
0 <https://www.msdmanuals.com/professional/multimedia/table/general-characteristics-of-types-1-and-2-diabetes-mellitus>.
]

[F. F. Prof. Martin Cowie, "What is e-Health?," 10 1 June 2020. [Online]. Available:

1 <https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-18/what-is-e-health>.

[S. Campbell, "Management of Type 2 Diabetes in the 1 Geriatric Patient.," *Journal of Pharmacy Practice*, 13, 2 , pp. 263 - 276., 2000.
]

[K. G. M. A. a. P. Z. Zimmet, "Definition, diagnosis and 1 classification of diabetes mellitus and its 3 complications. Part 1: diagnosis and classification of] diabetes mellitus. Provisional report of a WHO Consultation," *Diabetic Medicine*, vol. 15, 1998.

[G. G. E. G. F. d. P. M. Hernando, "Intelligent alarms 1 integrated in a multi-agent architecture for diabetes 4 management," *Transactions of the Institute of Measurement & Control*, vol. 26, pp. 185 - 200, 2004.

["General Characteristics of Types 1 and 2 Diabetes 1 Mellitus," 2022. [Online].
5
]

[D. G. a. J. Fox, "REACT - A Decision-support System 1 for Medical Planning," 2001.
6
]

[P. Jackson, Introduction to Expert Systems -Third 1 Edition, Addison-Wesley, 1998.
7
]

[N. M. Erica Oberg, "Type 2 Diabetes Diet Plan Foods 1 to Eat & Foods to Avoid," 22 04 2022. [Online].
8 Available:
] https://www.medicinenet.com/diabetic_diet_for_type_2_diabetes/article.htm.

["Meal plans and diabetes," 2022. [Online]. Available:
1 <https://www.diabetes.org.uk/guide-to-9-diabetes/enjoy-food/eating-with-diabetes/meal-plans>.
]

["Type 2 diabetes," 16 10 2020. [Online]. Available:
2 [https://www.idf.org/aboutdiabetes/type-2-](https://www.idf.org/aboutdiabetes/type-2-0%20diabetes.html)
0 diabetes.html.
]

Appendices