A Real Time Childcare Management Analytics based on Data Science

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Abstract- The paper titled "A Real time Childcare Management Analytics based on Data Science" focus on the Childcare centers for which they use various software to track the details of child/staff attendance, child/staff ratio and other details etc., So here there is a need to do deep analysis for the betterment of the information to be given to the parents and for betterment management of staff to improve decision making to manage the centre. The goal of the paper is to address above challenges by analyzing the data and do recommendations to improve operational efficiency of the centre.

Index Terms- Intellectual machine learning, decision making, segregation, Data Fusion and linear regression.

I. INTRODUCTION

Child Care Centre is established to take care of the children due to their parents need to involve them in work force. Therefore, child care centre act as an important role to parents and children as well. As observed from the existing work, there is a central management system software which consists of each and every details of childcare management system like child/staff attendance, child/staff ratio, demographic details but there is no accuracy of the data's and the records are not systematic.

The proposedwork to replace the current work and help the child care centre to have a better way in managing their data. Based on the current work, by using Intellectual machine learning algorithm the fields are been analyzed to find the correct ratio of child/staff availability and future prediction for betterment of management. By using the proposed work, staff can store the information systematically and they can perform backup services provided in the system. Therefore, if the data loss occurs, they can recover back the data in a short time.

The main aim of the paper is to get better resource management system and to improve the efficiency of the system in a better manner. It helps to give accurate analysis and it improves the decision making for better management.

Existing data are very huge there is no segregation for the data every data is mixed together so there is no convenience and cannot make the decisions for the management to improve their organization in better way.

II. LITERATURE REVIEW

Hope Child Care Management System (HCCMS) is a web-based system which is used to replace the existing system that still records the information on paper. This system benefits to both parents and staff. The existence of HCCMS allows parents to keep track their children status in the centre and they are allowed to reserve a meal for their children. For staff, they are allowed to manage all the information through this system instead of recording it on paper which might cause the data loss. Therefore, hopefully this system is able to help the staff to reduce human mistakes [1]. The traditional big-data analytical approaches use data clustering as small buckets while providing distributed computation among different child nodes.

These approaches bring the issues especially concerning network capacity, specialized tools and applications not capable of being trained in a short period. Furthermore, raw data generated through IoT forming big data comes with the capability of producing highly unstructured and heterogeneous form of data. Such form of data grows into challenging task for the real-time analytics. It is highly valuable to have computational values available locally instead of through distributed resources to reduce real-time analytical challenges [2].

It has become typical for children to attend some type of early childhood education (ECE) before entering kindergarten. This reflects both a greater attention to learning in the early years, as well as mothers' increased participation in the formal labor market For decades, scholars, policy-makers, and advocates have touted the potential of ECE to remediate disadvantaged children's low levels of achievement at school entry, and have more recently made the argument that these programs may also be beneficial for more affluent children. Although there has been a proliferation of evaluations of early education programs, the argument that these programs have lasting effects, particularly for economically disadvantaged children, has been largely based on a few early, small, high quality experimental studies. Most prominent among these studies has been the evaluation of the Perry Preschool Program, which found that a year or two of high quality [3].

Modern societies have recently changed their point of view about childhood education. Nowadays, kindergarten teachers are not only responsible for children's upbringing but they complement the educational role of families at home. In this new educational scenario, families and teachers present novel demands as real-time information about centers and its services, tools to track children progress or recommend new activities, new ways of communication, etc. Integration of ICT tools can offer a solution to those demands. Some electronic devices and software applications are being applied to this educational domain. However, they are used in isolation, lacking integration mechanisms that would improve their efficiency. This paper proposes a holistic framework that provides a set of ICT-based services designed taking into consideration the distinctive features of early care settings. We present the main design guidelines of a standard-based Reference Architecture that fosters interoperability and convergence between diverse technologies and heterogeneous systems [4].

Millions of families across the United States rely on home-based child care—noncustodial care in home-based settings—while they work or attend school. Indeed, home-based child care is the most prevalent form of noncustodial child care in the United States, especially for infants and toddlers and children living

in poverty. The National Survey of Early Care and Education (NSECE) estimated that about 7.1 million children from birth to age 5 receive care in home-based child care settings from more than 3.7 million caregivers (NSECE Project Team, National Survey of Early Care and Education Project Team. (2016). Characteristics of home-based early care and education providers: Initial findings from the National Survey of Early Care and Education. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research and Evaluation. In contrast, an estimated 3.8 million children receive care in centers. About half of home-based child care providers are located in moderate- or high-poverty density areas, and less than one third are paid for providing care [5].

III.   TECHNOLOGY IMPACTS ON ANALYSIS

A.   Analysis

In the existing work ,there is a central management system software which consists of each and every details of childcare management system like child/staff attendance, child/staff ratio, demographic details etc., but there is no accuracy of the data's and the records are not systematic. By that it leads to inefficient resource management.Here

- Lack of operational efficiency of the centre.
- High child/staff ratio, there is no correct ratio so that it leads to loss for themanagement.

The proposed work finding by using Intellectual machine learning algorithm like linear regression under Gaussian process the fields are been analyzed to find the correct ratio of child/staff availability and future prediction for betterment of management. By this it provides the information systematically for the management that how to manage the day care in an efficient way. This process leads to the development of the centre. Here,

- The Particular separate field data which is needed by the user can be taken easily without any confusion.
- The predicted information helps to utilize the resources in an efficient manner.
- Makes the work easier

- Gets the accurate analysis

B. Feasibility study

The feasibility of the system is analyzed in this paper and business proposal is set forth with a very general plan for the system and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out.For feasibility analysis, some understanding of the major requirements for the system is essential.

- Technical Feasibility:

The term used for a collection of data sets is so large and complex that it is difficult to process using traditional applications/tools. It is the data exceeding Terabytes in size. Here are the top technologies used to store and analyze. We can categories them into two (storage and Querying/Analysis).

- Operational Feasibility:

By using Machine Learning Algorithms, it solves the problems with the help of new proposed system and the requirements are identified. It takes care that the management and the users support the system.

IV. SYSTEM DESCRIPTION

The aim is to provide a safe and secure environment with quality care givers each state has a regulation in their own state like these much of staffs only should handle particular kids the ratio should be maintained according to the rules and regulations of the country and to give clear decision making for the organization for the betterment of development. The Figure 1 depicts the working process of Childcare Management Analytics.
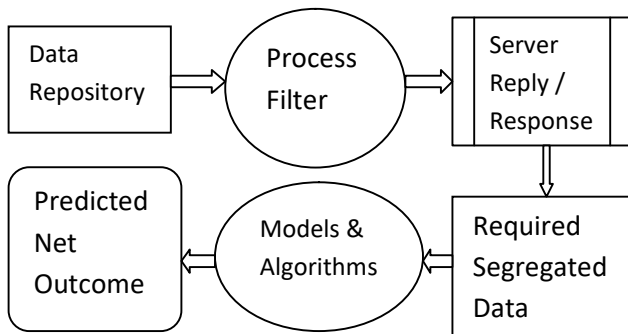

Fig.1System working template

1. Revenue Projection:
To understand the utilization of current revenue of the organization there are revenue data's and it is been getting allocated to every work but there is no enough insight for further improvisation for the organization. To get clear insight there is a tool called Hadoop the data gets processed through map reduce and the huge data is changed into smaller one and it provides a clear view by that decision can be done easily.

2. Late Payment:
Due to the occurrence of late payment the revenues are getting down and cannot allocate the revenue to collect field it is getting delayed so to avoid the thing, the reasons are founded out and with that planning the process can complete in correct time.

3. Attendance:
The attendance details are collected to find the correct child/staff ratio to avoid the under staff and over staff problem by finding to maintain the correct ratio. The ratio is been playing a major role by predicting it can avoid the over and under staff.
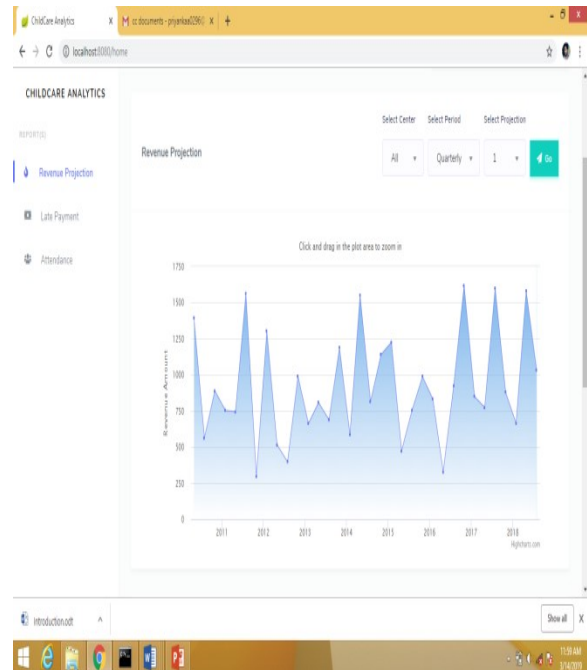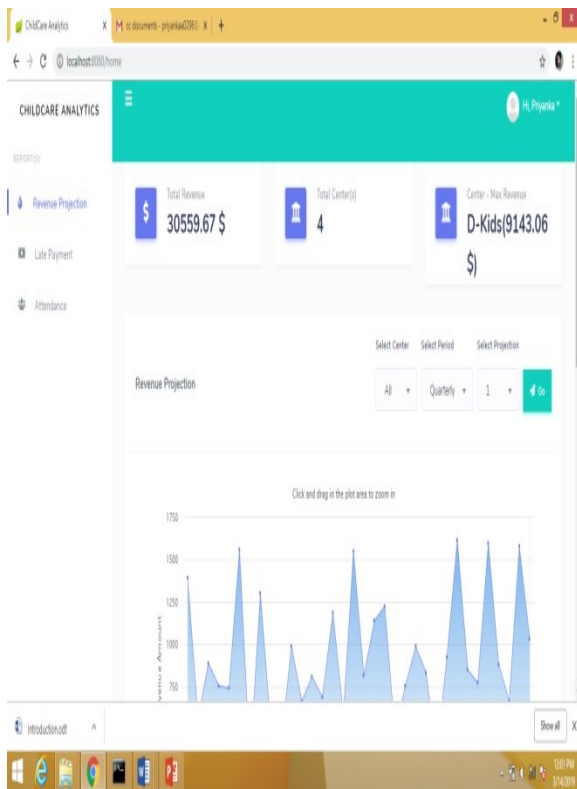
V. RESULTS

Fig.2 Projecting the Revenue

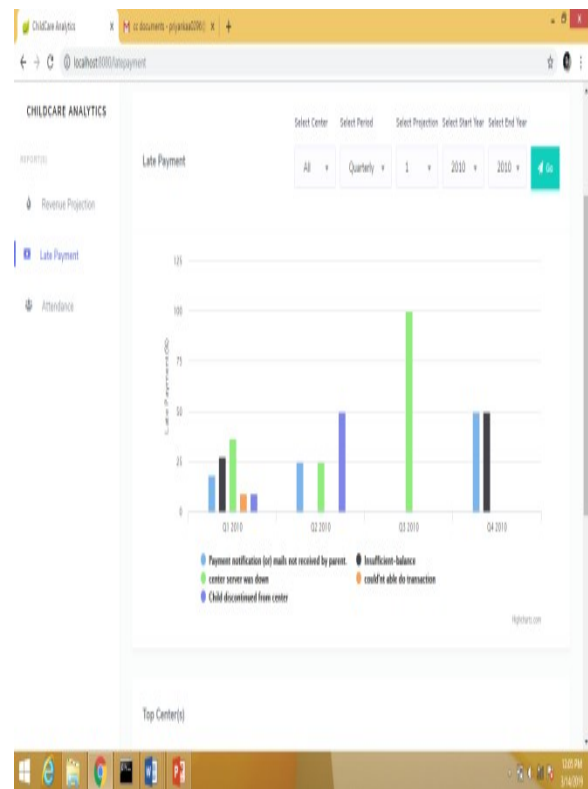Fig. 3Visualizing the Total and maximum Revenue
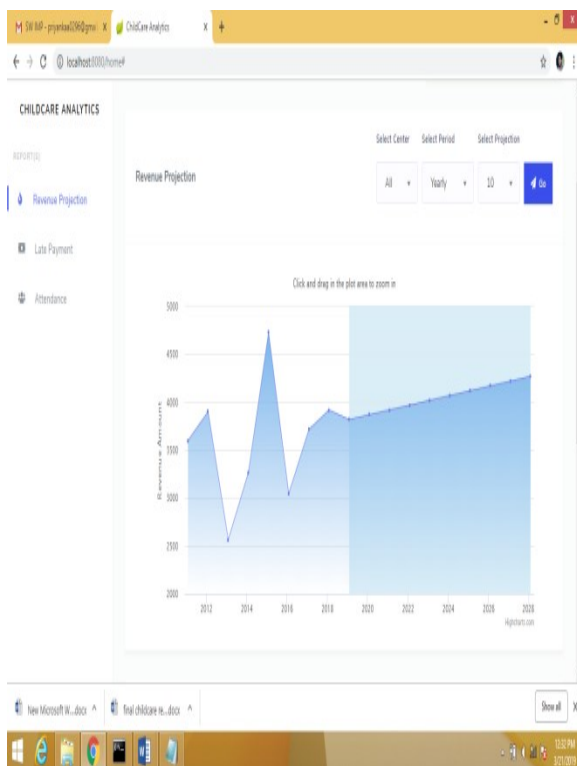

Fig.5 Projecting the Late Payment

Fig.4Projecting the Revenue for next 10 years

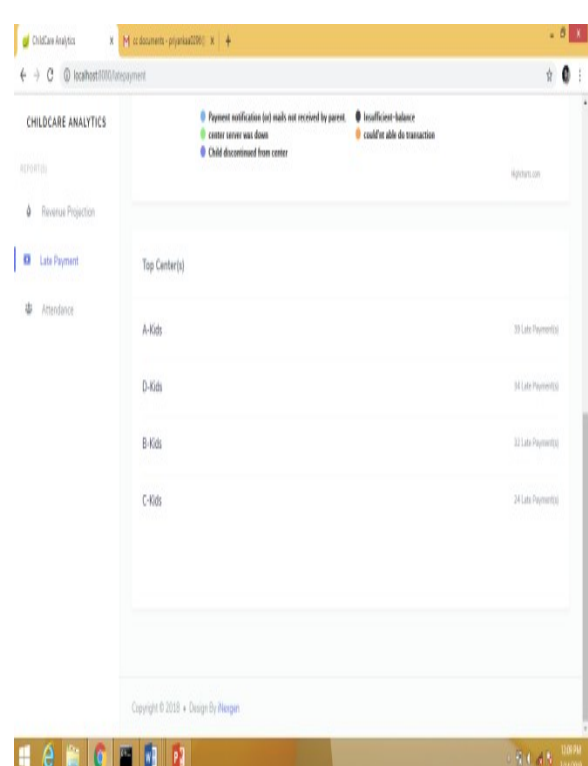Fig.6Visualizing the Total Late Payments for each centre

Fig.7 Staff Ratio Projection

Fig. 9 Data's Report

VI. CONCLUSION

There are expected output from this proposed system which are admin (or) staff can monitor the number of children in the center and they can correct the ratio of staff/child, this can help them to save a lots of time and more convenient for both staffs and the management for the better knowledge of the current status and there is a clear insight for the management to improve their efficiency in effective manner.

The efficiency of the system is demonstrated with single engine alone, for helping an organization for the betterment yarn can be used and it takes the original map reduce to another level for developing and for scheduling the capabilities from the data processing unit with multiple engines.

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Fig.8 Child Ratio Projection

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