



Student Aspects Monitoring Using Profile Matching

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Abstract— Attendance is a data collection activity to find out the presence of students in a class or an event. This is an important process throughout the teaching and learning process. One of them is supporting decisions for the school whether students can take the exam where attendance is the main requirement. Of course for parents is also an important thing to know the presence of their children in the learning process while in school. Currently attendance is being done manually by the teacher and it also has many disadvantages. One of them is invalid information when the data has been entered is incorrect. Another disadvantage of manual system is loss or damage of existing data and lack of efficiency and effectiveness in the process because attendance must be done at each turn of the lesson. From these problems raises an idea to create an Android based mobile application, it can take attendance automatically and can be monitored by school and parents. In addition, the teachers can review students at the end of each lesson and it can also make online reports that can be seen by parents. Supported by the availability of internet networks and GPS, this application can be used as a media controller and monitoring of students themselves. Utilize the React-Native technology as a tool to make this application and the methodology used in this application is Waterfall. With this application it can make easier for students, teachers and parents in the learning process at school.

Keywords— intelligent agent, attendance, profile matching, monitoring, android

I. INTRODUCTION

According to the Research Program for International Student Assessment (PISA) on 2015, Indonesia is ranked 63th from countries in the world, it shows that the development of education is currently progressing significantly. But the development and growth must still be followed by a supervisory function [1]. Educational institutions are responsible for learning activities both academically and non-academically [2]. In terms of carrying out the duties and functions carried out only can be monitored by two parties, namely related institutions and parents. One of the factors as a reference for monitoring is attendance.

Attendance is a data collection record, part of reporting activities of an institution, or component of the institution itself which contains attendance data that has been arranged and compiled, so that it is easy to find and used whenever required by interested parties [3]. This attendance is very important in education, because attendance can show the presence of students and it can be used as a consideration whether students can take the exam or not. Development of technology for attendance systems can also be used [4] [5]

To overcome this dilemma, the supervision system in learning activities, especially in the attendance system, is expected to provide facilities in the form of speeding up and electronic monitoring. With that basis,

the relevant agencies and people involved such as parents of students need a facility that can fulfil the need for simplification of the process and the application of attendance which is integrated quickly. Not only that, from the attendance the teacher can give a direct assessment to the students when the learning process takes place, the work ability of the brain is divided into two but interrelated, namely, IQ (Intelligence Quotient) and EQ (Emotional Quotient). IQ cannot develop. If someone is born with a moderate IQ, the IQ will not be able to increase or decrease again. EQ can grow as a person grows from birth to death. EQ growth is influenced by the family environment, and something obtained by someone from the birth of his parents. The assessment of the program is to produce reports on aspects of students that can be seen by parents to determine the tendency of EQ of students [6] [7].

To overcome these problems, agencies and people involved in it can apply technological developments on daily learning activities especially for attendance and assessment aspects of student attitudes. The technology can be used is by developing an android system [8].

At this time, the attendance system in schools is being done manually and makes the efficiency of student learning activities in schools disrupted. Parents also have a dilemma because they cannot supervise directly the education activities of these students in their schools. In this case there is need an application that can do it automatically and monitored by the school and parents, so the academic process will be more efficient, fast and accurate.

Based on these problems this paper describes the proposed application of monitoring with the application of intelligent agents to the monitoring information system aspects of students using matching profiles based on android.

II. METHODOLOGY

A. The Basic Concepts of Decision Support System (DSS)

Decision support system (DSS) is a part of a information system based computer which is used to support decision making in an organization or company. It can also be used as a computer system that processes data into information to make decisions from specific semi-structured problems [9].

B. Profile Matching

The profile matching is a decision-making mechanism that assumes that there is an ideal level of predictor variables that must be owned by applicants, rather than the minimum level that must be met or passed. [10].

C. Profile Matching Steps

There are several stages to find out the results of this method.

1) Target Value and determining the type of factor:

Determine the target value of each factor that has been determined [10].

TABLE I
TARGET VALUE

No	Aspect	Factor	Value	Type
1	Intelligence	Common Sense	3	C
2	Intelligence	Verbalizing ideas	3	C
3	Intelligence	Systematic thinking	4	S
4	Intelligence	Real reasoning and Solutions	4	S
5	Intelligence	Concentration	3	C
6	Intelligence	Practical logic	4	S
7	Intelligence	Flexibility of Thinking	4	S
8	Intelligence	Creative Imagination	5	C
9	Intelligence	Anticipation	3	C
10	Intelligence	Intelligence potential	4	S
11	Attitude	Psychic Energy	3	C
12	Attitude	Accuracy and responsibility	4	C

13	Attitude	Circumspection	2	S
14	Attitude	Feeling Control	3	S
15	Attitude	Achievement boost	3	C
16	Attitude	Vitality and Planning	5	S
17	Behavior	Dominance	3	C
18	Behavior	Influences	3	C
19	Behavior	Steadiness	4	S
20	Behavior	Compliance	5	S

Which:

C = Core Factor

S = Secondary Factor

2) Value Results

Value results from each individual aspect in accordance with the type of factor [10].

TABLE II
INTELEAGENT ASPECT

No	Name	I ₁ [C]	I ₂ [C]	I ₃ [S]	I ₄ [C]	I ₅ [S]	I ₆ [S]	I ₇ [S]	I ₈ [C]	I ₉ [C]	I ₁₀ [S]
1	Udin	2	4	3	3	2	2	4	3	2	3
2	Ganjar	3	4	3	3	2	3	4	2	4	4
3	Alfi	4	4	3	3	4	3	2	3	3	2
4	Nia	3	5	4	1	4	4	3	5	4	3

Which:

I₁ = Common Sense

I₂ = Verbalizing ideas

I₃ = Systematic thinking

I₄ = Real reasoning and Solutions

I₅ = Concentration

I₆ = Practical logic

I₇ = Flexibility of Thinking

I₈ = Creative Imagination

I₉ = Anticipation

I₁₀ = Intelligence potential

TABLE III
ATTITUDE ASPECT

No	Name	S ₁ [C]	S ₂ [C]	S ₃ [S]	S ₄ [S]	S ₅ [C]	S ₆ [S]
1	Udin	3	4	3	1	3	1
2	Ganjar	4	5	5	1	4	1
3	Alfi	4	2	2	4	5	2
4	Nia	1	5	5	5	5	2

Which:

S₁ = Psychic Energy

S₂ = Accuracy and responsibility

S₃ = Circumspection

S₄ = Feeling Control

S₅ = Dorongan Berprestasi

S₆ = Achievement boost

TABLE IV
BEHAVIOR ASPECT

No	Name	P ₁ [C]	P ₂ [C]	P ₃ [S]	P ₄ [S]
1	Udin	4	4	4	4
2	Ganjar	4	3	4	4
3	Alfi	4	5	5	2
4	Nia	3	3	4	5

Which:
 P₁ = Dominance
 P₂ = Influences
 P₃ = Steadiness
 P₄ = Compliance

3) Calculation of Competency Gap

In this case, the gap is different between result value of student profile with the target value each factor [10].
 The Calculation of Gap:

$$\text{Gap} = \text{Student Profile} - \text{Target Value}$$

From that formula can be shown the gap value each aspect like below:

TABLE V
INTELEGENT ASPECT

No	Name	I ₁ [C]	I ₂ [C]	I ₃ [S]	I ₄ [C]	I ₅ [S]
1	Udin	(2-3)=-1	(4-3)=1	(3-4)=-1	(3-4)=-1	(2-3)=-1
2	Ganjar	(3-3)=0	(4-3)=1	(3-4)=-1	(3-4)=-1	(2-3)=-1
3	Alfi	(4-3)=1	(4-3)=1	(3-4)=-1	(3-4)=-1	(4-3)=1
4	Nia	(3-3)=0	(5-3)=2	(4-4)=0	(3-4)=-1	(4-3)=1

No	Name	I ₁ [C]	I ₂ [C]	I ₃ [S]	I ₄ [C]	I ₅ [S]
1	Udin	(2-3)=-1	(4-3)=1	(3-4)=-1	(3-4)=-1	(2-3)=-1
2	Ganjar	(3-3)=0	(4-3)=1	(3-4)=-1	(3-4)=-1	(2-3)=-1
3	Alfi	(4-3)=1	(4-3)=1	(3-4)=-1	(3-4)=-1	(4-3)=1
4	Nia	(3-3)=0	(5-3)=2	(4-4)=0	(3-4)=-1	(4-3)=1

TABLE VI
ATTITUDE ASPECT

No	Name	S ₁ [C]	S ₂ [C]	S ₃ [S]	S ₄ [S]	S ₅ [C]	S ₆ [S]
1	Udin	(3-3)=0	(4-4)=0	(3-2)=1	(1-3)=-2	(3-3)=0	(1-5)=-4
2	Ganjar	(4-3)=1	(5-4)=1	(5-2)=3	(1-3)=-2	(4-3)=1	(1-5)=-4
3	Alfi	(4-3)=1	(2-4)=-2	(2-2)=0	(4-3)=1	(5-3)=2	(2-5)=-3
4	Nia	(1-3)=-2	(2-4)=-2	(5-2)=3	(5-3)=2	(5-3)=2	(2-5)=-3

TABLE VII
INTELEGENT ASPECT

No	Name	P ₁ [C]	P ₂ [C]	P ₃ [S]	P ₄ [S]
1	Udin	(4-3)=1	(4-3)=1	(4-4)=0	(4-5)=-1
2	Ganjar	(4-3)=1	(3-3)=0	(4-4)=0	(4-5)=-1
3	Alfi	(4-3)=1	(5-3)=2	(5-4)=1	(2-5)=-3
4	Nia	(3-3)=0	(3-3)=0	(4-4)=0	(5-5)=0

TABLE VIII
GAP INFORMATION

Gap	Information
0	There was no gap (The competence is appropriate with its required)
1	The competence of individual exceeds one level
-1	The competence of individual lacks one level
2	The competence of individual exceeds two level
-2	The competence of individual lacks two level
3	The competence of individual exceeds three level
-3	The competence of individual lacks three level
4	The competence of individual exceeds one level
-4	The competence of individual lacks four level

4) *Benchmark Weighting*

After obtaining each gap value, User Profile will be given the value with the table of the gap of benchmark weighting [10].

TABLE IX
WEIGHTING

No	Gap	Value
1	0	5
2	1	4,5
3	-1	4
4	2	3,5
5	-2	3
6	3	2,5
7	-3	2
8	4	1,5
9	-4	1

The Calculation of Core Factor:

$$rCF = \frac{\sum NC}{\sum IC}$$

Which:

rCF = The Average value of core factor

NC = The Total Value of core factor

IC = The Number of item of core factor :2

The Calculation of Secondary Factor:

$$rSF = \frac{\sum NS}{\sum IS}$$

Which:

rCF = The Average value of secondary factor

NC = The Total Value of secondary factor

IC = The Number of item secondary factor : 2

The Calculation of Total Value :

$$Value = rCF(60\%) + rSF(40\%)$$

Which:

rCF(60%) = The Average value of core factor X 60%

rSF(40%) = The Average value of secondary factor X 40%

Based on table weighting and formula above, we can see the individual result value each of the following factor like bellow:

TABLE X
INTELEGENT ASPECT

No	Name	I ₁ [C]	I ₂ [C]	I ₃ [S]	I ₄ [C]	I ₅ [S]	I ₆ [S]	I ₇ [S]	I ₈ [C]
1	Udin	4	4.5	4	4	4	3	5	3
2	Ganjar	5	4.5	4	4	4	4	5	2
3	Alfi	4.5	4.5	4	4	4.5	4	3	3
4	Nia	5	3.5	5	4	4.5	5	4	5

No	Name	I ₉ [C]	I ₁₀ [S]	rCF(60%)	rSF(40%)	Value
1	Udin	4	4	19.5/5=3,90	20/5=4,00	3,94
2	Ganjar	4.5	5	20/5=4,00	22/5=4,40	4,16
3	Alfi	5	3	21.5/5=4,30	18/5=3,60	4,02
4	Nia	4.5	4	22.5/5=4,50	22/5=4,40	4,46

TABLE XI
ATTITUDE ASPECT

No	Name	S ₁ [C]	S ₂ [C]	S ₃ [S]	S ₄ [S]	S ₅ [C]
1	Udin	5	5	4.5	3	5
2	Ganjar	4.5	4.5	2.5	3	4.5
3	Alfi	4.5	3	5	4.5	3.5
4	Nia	3	4.5	2.5	3.5	3.5

No	Name	rCF(60%)	rSF(40%)	Value
1	Udin	15/3=5,00	8.5/3=2,83	4,13
2	Ganjar	13.5/3=4,50	6.5/3=2,17	3,57
3	Alfi	11/3=3,67	11.5/3=3,83	3,73
4	Nia	11/3=3,67	8/3=2,67	3,27

TABLE XII
BEHAVIOR ASPECT

No	Name	P ₁ [C]	P ₂ [C]	P ₃ [S]	P ₄ [S]	rCF(60%)	rSF(40%)	Value
1	Udin	4.5	4.5	5	4	9/2=4,50	9/2=4,50	4,50
2	Ganjar	4.5	5	5	4	9.5/2=4,75	9/2=4,50	4,65
3	Alfi	4.5	3.5	4.5	2	8/2=4,00	6.5/2=3,25	3,70
4	Nia	5	5	5	5	10/2=5,00	10/2=5,00	5,00

D. Method for Grab Data

This research use 3 method for collect the data source and data analysis process:

- 1) Observation:
The author makes SMPN 01 Batu, Jawa Timur to be place for Observation. In that place we getter the information about process lesson between students and teacher.
- 2) Interview:
In the Interview author make discussion with Mrs. Sri Hariyati as a Pendidikan Kewarganegaraan teacher, homeroom teacher of 7E and interviewees at SMPN 1 Batu.
- 3) Literature Review
In this literature review, the author learn about theory in book, journal, internet and guide book from SMPN 01 Batu that related with the information and method for this research.

III.RESULTS AND FINDINGS

Based on process above we can take conclusion that each student got propensity value in one aspect result

TABLE XIII
RESULTS

No	Name	I	S	P
1	Udin	3,94	4,13	4,50
2	Ganjar	4,16	3,57	4,65
3	Alfi	4,02	3,73	3,70
4	Nia	4,46	3,27	5,00

Which:

I = Intelligence Aspect

S = Attitude Aspect

P = Behavior Aspect

Findings

Below is findings of the results above:

- Udin propensity good in attitude aspect on the class.
- Ganjar propensity good in attitude aspect on the class
- Alfi propensity good in intelligence aspect on the class
- Nia propensity good in attitude aspect on the class

IV.CONCLUSIONS

Conclusion from this study are:

- 1) Each aspect and criteria influence student tendency.
- 2) By doing Calculation using the profile matching method, student aspects produce one tendency aspect.

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