Experiment Design for Prediction of Human Personality through Analysis of Activities Stored in Electronic Organizer

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ABSTRACT

The paper focuses on analysis human activity for prediction of human personality contribute the development of personality assessment. The purpose of this study is to design an experiment so as to predict personality through the analysis of activities stored in electronic organizer. The study is designed in order to get the framework for analysis the activities stored in electronic organizer. This uses a methodology that consists of four phases; Problem Identification, Data Collection and Pre-Processing, Development, and Experiment. A cognitive science technique is applied for it output which be used in planning of a model prediction yields. All activities done in the computer will be classified for contributing the development of personality assessment. The experiment design is contributing to the development of a model of which awoken will be applied to produce who will be a part of a human friend or personal assistant. The prediction brings big impact for unexpected result which can be put into practice in machine in future where it will have the same capabilities of human action as human accompanies.

KEYWORDS

human activity prediction, personality model, cognitive science, personal assistant, electronic organizer

1 INTRODUCTION

Human personality is a mirror of human impression. Prediction of human personality can help in generating indispensable in evaluating hoped for compatibility [1]. Prediction of human activities can be done based on activities which recorded in software such spyrix personal monitor, calendar, Facebook and Google. Human activity is narrow to behavior or personality where it can be predicted relatively accurately by analyzing social media profiles [2]. Besides, personality of human also has been predicted through handwriting analysis or graphology included individual personality traits [3]. The prediction is important for a development of personality model in the future prediction where gadget names handphone or tablet, will be a part of a human friend accompany or personal assistant.

Personality assessment is most frequently measured for either situation characteristic or differential of behavioral. The changes of assessment be able to use for prediction of human being behavior based on analytical thinking through some techniques. Rapid progression in the software engineering field results the increase of demand for new approaches in the programming field [4], [5]. Nowadays, the demand leads to software development for a short time frame and estimates the cost of production. Researches in the area of science held research for understanding the processes which occurred during human being activities such as object, think, remember, speak, and listen. All these activities are part from cognitive process happens in human brain.

The prediction process is done using activities stored in electronic organizer. Electronic organizer names PDAs and some typical controller, range from very small and very cheap devices [6]. It can hold no more than a few tens or so of telephone entries up to large, relatively expensive units that are as powerful, and can hold vast quantities of text, sound, graphics, and other types of computer files [7]. The activity stored is referred to any actions occur in the computer that has been recorded.

The research on cognitive process is important in an effort to understand the function and the structure of the brain in order to further develop the field of cognitive science, especially related to cognitive neuroscience [8]. The cognitive knowledge theories prepare a value vision in

human perception that can befall as artificial intelligence. The artificial intelligence cognitive knowledge is powerful province researches that address the purposes for cognitive knowledge and artificial intelligence. As a researcher, the intelligence agent will be expanded with the ability for human intelligence simulation in academic research either for fully understanding of human thinking or resolve through artificial intelligence.

This research attempt to design an experiment so as to predict personality through the analysis of activities stored in electronic organizer. The experiment design will contribute to the development of models which awoken will be applied in producing models for machine who will be a part of a human friend or personal assistant. This experimental design is important in getting the framework of analysis for all processes. The rest of the paper is organized as follows: the next section reports some previous related works addressing, human activity prediction, personality assessment, cognitive science, and analytical thinking. Section 3 describes the experiment design included methodology used in this work. Section 4 present the discussion and finally, Section 5 draws the conclusions.

2 RELATED WORK

Prediction as an ability to recognize complex human activities from videos enables the construction of several important applications. The action or activity of human come from human brain where it represents conceptual knowledge [9]. The prediction of human brain had been done through computational model that envisage the functional magnetic resonance imaging neural activation associated [9]. Automated surveillance systems in public places like airports and subway stations require detection of abnormal and suspicious activities, as opposed to normal activities. [10], [11]. Prediction of human personality can be done through many sources names handwriting analysis [12], [13], [14], virtual human where focus on computer graphic [15], cell phone stems recorded [16], digital recorded [17], and action by factors of psychology prediction [18], [19] that has been shown in Table

1. Each personality feature is represented by a neurological brain pattern where it refer to behavior or action taken [14].

Human personality has been predicted in order to gain benefits for future time [20]. The yields of prediction then have been implemented to generate model. The model is proposed not only for a general understanding of human behavior but also for psychologists to treat personality disorders. In facts, the model acts as general prototype for researcher in order to develop personal assessment machine. The five factors are considered as the basis or the dimensions of personality space. They are detailed in the following Table 1 [15], [21]. Personality measures are increasing being used in evaluation main features in personnel selection for performance prediction [21]. The factors are utilized in the process of analyzing the data source for its knowledge and implementation of prediction process.

Table 1. Five Personality Dimensions [15], [21]

Factor	Description	Adjectives used to describe
Extraversion	Preference for and behavior in social	Talkative, energetic, social
Agreeableness	Interactions with others	Trusting, friendly, cooperative
Conscientiousness	Organized, persistent in achieving goals	Methodical, well organized, dutiful
Neuroticism	Tendency to experience negative thoughts	Insecure, emotionally distressed
Openness	Open minded-ness, interest in culture	Imaginative, creative, explorative

Personality assessment of human being relates to their activities or actions all day long. The assessment has typically stayed the same [22] with the investigation of correlation between personality and achievements. Analyzing human personality can help in generate the idea of how is human thinking. The analysis of human

personality is important in reads and understands their behavior because there are exist some individual severely struggling with their own personality tendencies in fixing problems [23], [24]. There are some classes of tendency appearances of human personality included antisocial, narcissistic, borderline, schizotypal, obsessive-compulsive, and avoidant [23]. Reflect from Gary's in 1981 [24] initial theory proposing personality of human being dimensions of reward sensitivity or impulsivity, and threat sensitivity. Figure 1 shows the temperaments as influences on behavior. Identification of human personality through activities by extraction of knowledge that found in data recorded from human activity in computer. This identification process is involved analyzing data, prediction process, and generate model, where it will implement in real machine.

The process of prediction is based on electronic organizer. On the other hands, prediction of human activities inter-influences is not solved even through pattern recognition of sequences of past actions. Random forest has been used in prediction process with the implementation of algorithm to scale all activities [25]. The classical Q-learning algorithm has been used in order to predict based on observation of human activity through simulation [26]. Prediction methodology through integral-bag-of-words is used to represent human activity as use in video observation [11]. Appreciative of personality assessment brings an understanding of a stable set of characteristics and tendencies that determine peoples' commonalities and differences in thoughts, feelings, and actions [22], [27]. Research on personality assessment begin through the role of cognitive style where it premise that the mental function related to information gathering and decision-making are central to one's personality [27]. For decades, the personality and cognitive style have been studied as dispositional factors [28]. The process of personality studies tries to avoid tiredness effect. Personality characteristics have a significant impact on individual performance within a team environment [22], [29]
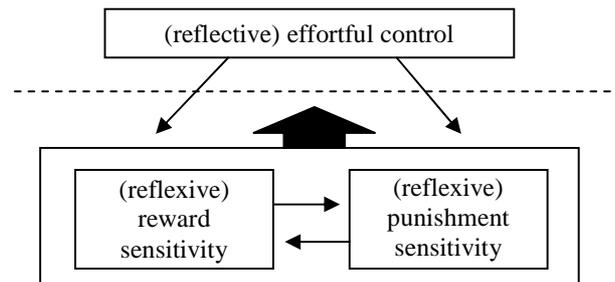

Figure 1. Three temperaments as influences on behavior [24].

Cognitive science as a tender for new discipline of science research into human brain to reveal the origin of mind [30], [31]. This technique refers to cognitive process where specific influences on a human cognitive information processing [32], as this research focus more on investigate mental phenomena in translate or transform it into an application for further study. Artificial intelligence as a tool for cognitive research where it is a branch of computer science concerned with creating simulation that model human cognition [31]. The collaboration between two fields; cognitive science and artificial intelligence act as essential for success. Cognitive theory holds that human memories comprises a very limited working memory [33]. The philosophy Umbaldo Nicola [34] represent cognitive approach as a "diamond" model where all possible faces are interconnected as shows in Fig. 2. It includes information science, philosophy, psychology, linguistics, anthropology, and neurophysiology. Intelligence artificial is part of information science where it has been helped to interpret the personality assessment in form of extracting knowledge for forming model [35].
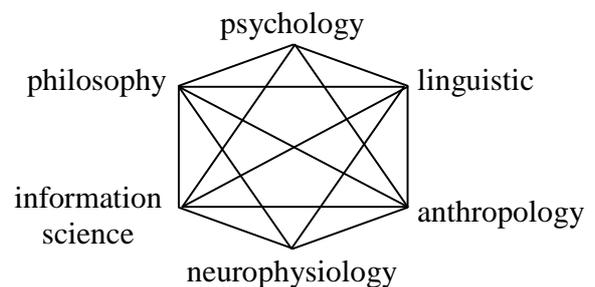

Figure 2. Cognitive Science

There are potential of research for developing technology in form of simulate human-level intelligence in order to increase the progress of mankind through cognitive science [31], [36].Hence, seeing that to manipulate the yield of personality assessment based on analytical analysis, some research has been studied towards

it. The interaction of cognitive science and model behavior especially robotics has always been tight [36]. Attachment of model is important. Analytical thinking is more refers on logical and leads to unique or few answer which can be implemented [37], [38]. Quantify of potentially important information cannot be gained without proper analytical thinking model [39], besides of solving the problem. This model is implemented for developing thought development machine for human being.

Machine is a tool to perform or assist in the implementation of human task the machine will work when the presence of an input or orders given by human. [40]. Human capabilities and functions of the machine is supporting each other it is a common viewpoint [41]. Explanation of current human and machine capabilities are given in Table 2 [42], [43], [44]. The strengths that exist in humans and machines relevant matters raised in the problem application presented later in the paper. Technology means mobile technology introduces Zompopo as Android application where help human to schedule their activities [45]. This kind of application is included as tool of helping in collecting data.

Table 2. Human and Machine Capability List

Human	Machine
Flexible/Adaptable	Displaying Information
Creativity	Data Management
Visual Perception	Simple Repetitive Works
Learning From Experience	Performing Calculation
Complex Communication	Combinatorial Problems
Conceptualization	Continuous Availability
Symbolic or Spatial Reasoning	Fast Computational Parallel Reasoning
Intuition	Accuracy
Pattern Recognition	Low Cost
Narrowing search space	Ignoring extraneous factors
Strategic Assessment	Monitoring processes
Understanding the "Big Picture"	Deductive processes

Previous experiment has been implemented using probabilistically methodology formulate in solving the activity prediction problem via video recorded or virtual words, named integral bag-of-words and dynamic bag-of-words [11]. This research focus on experiment via electronic organizer recorded where the knowledge can be used for further prediction model. The literature efforts human activity prediction where contribute to the development of personality assessment, uses

of cognitive science in develop a model of which awoken will be applied for produce who will be a part of human friend or personal assistant.

3 THE EXPERIMENT DESIGN

The study is designed in order to get the framework for analysis the activities stored in electronic organizer. This uses a methodology that consists of four phases; Problem Identification, Data Collection and Pre-Processing, Development, and Experiment. The flow of experiment design framework is shown in Figure 3.
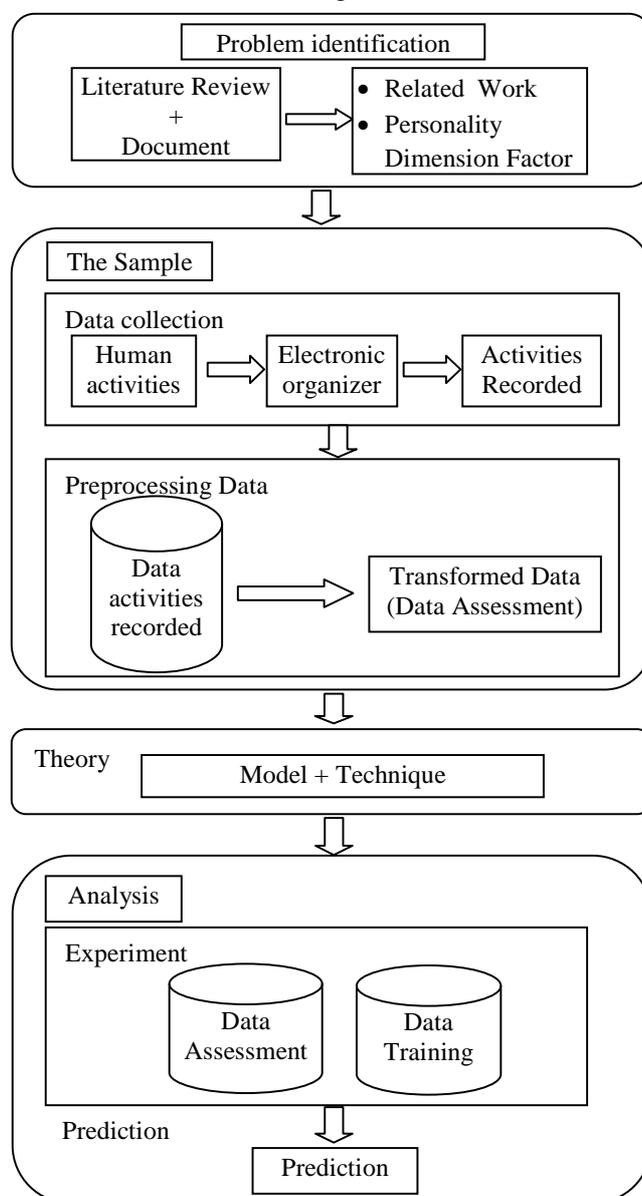

Figure 3. Experiment Design

3.1 Problem Identification

The relevant previous works are studied in order to identify the real problem which related to human activities in real life. This study starts with the fundamental study of human activities including personality prediction, personality model, and electronic organizer. It involves a review of previous related works. The aim of this phase is to understand and identify domain problems, identify related approaches and algorithms, identify possible solution and formulate study objective. The identified of problems will be further clarified and the method for data representation will be explained.

3.2 The Sample

The sample is a collection of activities in computer as a first phase via electronic organizer. It is collected using software called Spyrix Personal Monitor. All activities performed on the computer will be recorded. The result then sends to email which has been previously set in a matter of minutes. The data type format in .csv form. Figure.4. shows the data sample from Spyrix Personal Monitor software.

3.3 Theory and Experiment

The experiment phase will involve model validation and evaluation using several performances metric such as efficiency, accuracy and stability. The model also will be compared with other prediction model from the previous studies. Some theories included methods and techniques, will be used with the purpose of getting result.

3.4 Analysis Process for Prediction

The prediction process acts as development progression where it is implementing on collected sample. The prediction is done based on Bayes theorem technique. This is used to forecast the human command activities in daily life which can be put into practice in machine in future where it will have the same capabilities of human action as human accompanies. The probabilistically formulates prediction of activities process as:

$$P(A_p|O,t) = \sum_d P(A_p, d|O,t)$$

$$= \frac{\sum_d P(O|A_p, d)P(t|d)P(A_p, d)}{\sum_i \sum_d P(O|A_i, d)P(t|d)P(A_p, d)\sum_d}$$

[11]

where, d is a variable which represents increasing of Ap activity. As example, $d = 50$ shows that *Ap* activity has been expanded from frame 0 to frame 50. This situation shows that the prediction process ought to consider all sequences of probability of $0 \leq d \leq d *$. $P(t | d)$ with sends of equality between t and activity of d. The data is going through pre-processing step via clustering process [46]. Then, it has been used for analysis in prediction.

4 DISCUSSIONS

The design of experiment is propose in rank predict personality through the analysis of activities stored in electronic organizer. The design shown steps for experiment which act as a guide line for further action.

4.1 The Raw Data

The experiment has implement and analysis of human activity prediction methodology while comparing it with previous classification works. The human activity has been recorded using events that occur through electronic organizer which is Spyrix Personal Monitor. The sample is a collection of activities as a raw data in computer with 3173 data represents 24 hours activities per day.

Figure 4. The data sample from Spyrix Personal Monitor software

4.2 The Cluster Data

The design of the experiment starts by cluster the data through preprocessing process. The cluster

data then had been analyst for gaining the most frequent activities during the experiment.

4.3 Analysis Data

The collected data is exported to statistic software in order to extract significant knowledge. The analysis data has been done for gaining frequent activities through statistic software. The analysis data statistic starts with performance of data content by looking any error means missing values. As through the data sample, the valid data event and title description is 3173 with no missing value as shows in Figure 5. The process of analysis presents the event, frequency, frequency in percent, and cumulative percent. From the analysis, every action in daily activities have been calculated and presented in form of table as shows in Figure 6. All activities that recorded have mark as event. The event explain of every action happens in the computer as shown in Figure 6. The analysis assists in identify the highest activity involved in data records with percentage of frequency is 'screenshot' with 40.37 percent.

Statistics

		Event	Title Description
N	Valid	3173	3173
	Missing	0	0

Figure 5. The data performances through statistic software

Event	Frequency	Percent	Cumulative Percent
>	4	0.13	0.13
ACTIVITY	47	1.48	1.61
Event	1	0.03	1.64
FACEBOOK_START	12	0.38	2.02
FACEBOOK_STOP	12	0.38	2.40
KEYBOARD	811	25.56	27.95
PRG_QUIT	408	12.86	40.81
PRG_RUN	439	13.84	54.65
SCREENSHOT	1281	40.37	95.02
URL	158	4.98	100.00
Total	3173	100.00	

Figure 6. Result of analysis using statistic software

The performance from analysis is capable for prediction ongoing activities in real-time of human activity. The mechanism of prediction human activity can be realizing based on data the statistical recorded of human activities and frequent activity in computer.

5 CONCLUSION

The study aims to design an experiment so as to predict personality through the analysis of activities stored in electronic organizer. Based on previous study, the prediction will be important for a development of personality model it is a future prediction. There is framework for the processes which involve studying previous literature, problem identification, data collection and pre-processing, development, and experiment. The flow towards the prediction has been shown through the experiment and brings big impact for unexpected result which can be put into practice in machine in future where it will have the same capabilities of human action as human accompanies.

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