http://infor.seaninstitute.org/index.php/infokum/index
JURNAL INFOKUM, Volume 9, No. 2,Juni 2021 ISSN : 2302-9706

DESIGN OF LEARNING APPLICATION SYSTEM TO KNOW INDONESIAN LANGUAGE OBJECTS FOR EARLY CHILDHOOD EDUCATION

Ilham Pratama[1], Volvo Sihombing[2], Ibnu Rasyid Munthe[3]
[1,2,3]Information Management, Labuhan Batu University, Rantauprapat, Indonesia
volvolumbantoruan@gmail.com[1], ibnurasyidmunthe@gmail.com[2]

Article Info
Received 25 March 2021
Revised 25 April 2021
Accepted 6 June 2021

Abstract

Today, along with the times, which are supported by the rapid development of technology, all aspects of life cannot be separated from the influence of technology. The research was conducted to try to conduct research with the aim of examining more deeply what ingredients can be said to be harmful in food, how the performance of BBPOM in determining these hazardous materials, and how BBPOM will follow up if it has been found that some foods containing hazardous ingredients have been found. and what steps are taken to minimize the use of these hazardous materials in order to maintain the health of consumers. In drawing conclusions in expert systems, Forward Chaining and Backward Chaining are generally used. However, with the use of these two reasons, it is not possible to determine the value of confidence in the hypothesis. Based on the research conducted, it was found several things that can be observed in the development of uncertainty consultation media in the identification of formalin and borax in meatballs, namely the following, including the existence of an expert system with the certainty factor method, so that people can find out the characteristics of formalin meatballs without meeting directly with expert doctors or the expert. Likewise for designing expert system applications to identify food hazards in Formalin and Borax can use Visual Studio 2010 Applications Based on the research conducted, it was found several things that can be observed in the development of uncertainty consultation media in the identification of formalin and borax in meatballs, namely the following, including the existence of an expert system with the certainty factor method, so that people can find out the characteristics of formalin meatballs without meeting directly with expert doctors or the expert. Likewise for designing expert system applications to identify food hazards in Formalin and Borax can use Visual Studio 2010 Applications Based on the research conducted, it was found several things that can be observed in the development of uncertainty consultation media in the identification of formalin and borax in meatballs, namely the following, including the existence of an expert system with the certainty factor method, so that people can find out the characteristics of formalin meatballs without meeting directly with expert doctors or the expert. Likewise for designing expert system applications to identify food hazards in Formalin and Borax can use Visual Studio 2010 Applications

Keywords:, Backward Chaining, Certainty Factor, Expert System, Formalin, Forward Chaining

1. Introduction

The development of science and technology has accelerated in various aspects of life. One of these

aspects is the development of the foods and beverages we consume daily. Currently, along with the times that are supported by the rapid development of technology, all aspects of life cannot be separated from the influence of technology.[1]. In terms of food, supported by the role of women, nowadays women are born not only to take care of the household, but also to become women who earn big or often called career women, so that there is almost no time to prepare food for the family, so it is not surprising that fast food Serving is preferred as one of the main alternatives to filling the stomach considering the taste of the food served and the serving time is only a matter of minutes so it doesn't take up a lot of time. But without realizing it, some types of fast food that are often consumed contain several types of harmful ingredients that trigger chronic diseases, such as: heart attack, insulin resistance, diabetes, and several other dangerous diseases.[2].

The research was conducted to try to conduct research with the aim of examining more deeply what ingredients can be said to be harmful in food, how the performance of BBPOM in determining these hazardous materials, and how BBPOM will follow up if it has been found that some foods containing hazardous ingredients have been found. and what steps are taken to minimize the use of these hazardous materials in order to maintain the health of consumers[3]. Seeing this impact, the authors are interested in making an expert system application to identify the content of formalin and borax in food. In drawing conclusions in expert systems, Forward Chaining and Backward Chaining are generally used. However, with the use of these two reasons, it is not possible to determine the value of confidence in the hypothesis. So that the expert system can do reasoning like an expert even in conditions of data uncertainty and to get a confidence value in this case the author uses a method to solve the data using the Certainty Factor (CF) method.[4]. Certainty Factor method is a method that defines a measure of certainty against a fact or rule, to describe the level of expert confidence in the problem at hand, using Certainty Factor this can describe the level of expert confidence[5][6].

2. Literature Review

2.1 Expert system

Expert system is a computer-based system that uses knowledge, facts, and reasoning techniques in solving problems, which usually can only be solved by an expert in a particular field.[7]. This definition shows that Artificial Intelligence is part of computers so it must be based on sound theoretical (sound theory) and these principles include the data structures used in the representation of knowledge, the algorithms needed to apply this knowledge, as well as the programming languages and techniques used in the representation of knowledge. implement it[8].

An expert system is a computer-based application that is used to solve problems as thought by experts. The experts referred to here are people who have special skills who can solve problems that cannot be solved by ordinary people[9][10].

2.2 Certainty Factor

The certainty factor was introduced by Shortliffe Buchanaan in making MYCIN (Wesley, 1984). Certainty Factor (CF) is a clinical parameter value given by MYCIN to show the amount of confidence[11]. Certainty Factor is defined as follows[10]:

$$CF(H,E) = MB(H,E) - MD(H,E) \quad (1)$$

Information :

CF (H,E) : Certainty factor of hypothesis H which is influenced by symptoms (evidence) E. The amount of CF ranges from -1 to a value of 1 indicating absolute confidence.

MB (H,E) : The measure of the increase in belief (measure of belief) on hypothesis H which is influenced by symptoms E.

MD (H,E) : The measure of increased disbelief (measure of increased disbelief) against hypothesis H which is influenced by symptom E.

Certainty factor to determine parallel CF

$$CF(x \text{ and } y) = \min(CF(x), CF(y)) \quad (3)$$

$$CF(x \text{ or } y) = \max(CF(x), CF(y)) \quad (4)$$

$$CF(\text{Not } x) = -CF(x) \quad (5)$$

Certainty factor to determine sequential CF

$$CF(H,E)1 = CF(E,e) * CF(H,E) \quad (6)$$

Certainty factor for similar rules

$$CfcombineCF(H,E)1,2 = CF(H,E)1 + CF(H,E)2 * (1CF(H,E)1) \quad (7)$$

$$CfcombineCF\ (H,E)old3 = CF\ (H,E)old + CF\ (H,E)3 * (1CF(H,E)old) \quad .....(2.6)$$

3. Results and Discussion

Stages of analysis of a system is carried out before the design stage is carried out. The purpose of applying analysis to a system is to find out the reasons why the system is needed, so that the functions contained in the system work optimally. One of the main elements that must be considered in the analysis stage of this system is the software problem, because the software used must be in accordance with the problem to be solved.

Table 1. Characteristics of Formalin Meatballs and Borax

No	*code*	*Characteristic features*	*Expert Value*
1	C1	Very Chewy	0.2
2	C2	Stay intact for 3 days	0.2
3	C3	Colors tend to be clean	0.4
4	C4	Strong smell	0.8
5	C5	Tend to be hard	0.5
7	C6	Ball like a ball	0.4
8	C7	Not stale for 5 days	0.6

Table 2. Confidence Weight

No	*Information*	*Confidence Weight*
1	Not	0
2	Do not know	0.1
3	A little sure	0.2
4	Pretty sure	0.6
5	Sure	0.8
6	Very confident	1

For example, the process of giving weight to each premise (symptom) to obtain a percentage of confidence to identify foods that contain formalin and borax.

Production rules or rules relating to foods containing formalin and borax are as follows:
Rule
IF Very chewy
AND Stay intact for 3 days
AND Colors tend to be clean
AND Scent
AND tends to be loud
AND Ball like a ball
AND Not stale for 5 days
THEN these foods contain formalin and borax

The first step, the expert determines the CF for each of the following characteristics:
Expert CF (Very supple) =0.2
Expert CF (Stayed intact for 3 days) =0.2
Expert CF (Color tends to clear) =0.4
Expert CF (Stinging smell) =0.8
Expert CF(Tends to be hard) =0.5
Expert CF(Ball like a ball) =0.4
Expert CF (Not stale 5 days) =0.6
Suppose the user chooses an answer as follows:
Very supple = Slightly sure = 0.2
Remains intact for 3 days = Pretty sure = 0.6
Color tends to clear = Slightly sure = 0.2
Strong smell = Sure = 0.8
Tend to be hard = Sure = 0.8
Bouncing like a ball = Sure = 0.8
Not stale 5 days = Very sure = 1

The rule is then calculated the value of Cf by shifting the Cf of confidence with CF to be:
CF[H,E] 1 = CF[H] 1 * CF[E] 1
=0.2 * 0.2
=0.04
CF[H,E] 2 = CF[H] 2 * CF[E] 2
=0.2 * 0.6
=0.12
CF[H,E]3 = CF[H] 3 * CF[E] 3
= 0.4 * 0.2
= 0.8
CF[H,E] 4 = CF[H] 4 * CF[E] 4
= 0.8 * 0.8
= 0.64
CF[H,E] 5 = CF[H] 5 * CF[E] 5
= 0.5 * 0.8
= 0.40
CF[H,E] 6 = CF[H] 6 * CF[E] 6
= 0.4 * 0.8
= 0.32
CF[H,E] 7 = CF[H] 7 * CF[E] 7
= 0.4 * 0.8
= 0.32
CF[H,E] 8 = CF[H] 8 * CF[E] 8
= 0.6 * 1
= 0.6
The last step is to combine the CF values of the rules. Here is the combination of CF[E] with CF[H,E] :
CFcombine CF[H,E] 1,2 = CF[H,E] 1 + CF[H,E] 2 * (1- CF[H,E] 1)
= 0.04 + 0.12 * (1-0.04)
= 0.1536 old
CFcombine CF[H,E] old,3 = CF[H,E] old + CF[H,E] 3 * (1- CF[H,E] old)
=0.1536+ 0.8 * (1 – 0.1536)
= 0.807127 old 2
CFcombine CF[H,E] old2,4 = CF[H,E] old + CF[H,E] 4 * (1- CF[H,E] old2)

= 0.807127+ 0.64 * (1 – 0.807127)
= 0.2791117 old 3
CFcombine CF[H,E] old3,5 = CF[H,E] old + CF[H,E] 5 * (1- CF[H,E] old3)
= 0.2791117 + 0.40 * (1 – 0.2791117)
= 0.2313246 old 4
CFcombine CF[H,E] old4,6 = CF[H,E] old + CF[H,E] 6 * (1- CF[H,E] old4)
= 0.2313246 + 0.32 * (1 – 0.2313246)
= 0.4237897 old 5
CFcombine CF[H,E] old5,7 = CF[H,E] old + CF[H,E] 7 * (1- CF[H,E] old5)
= 0.4237897 + 0.6 * (1 – 0.4237897)
= 0.5899182 old 6
CF[H,E] old8 * 100 = 0.5899182 * 100 = 58.99182%
Thus it can be said that the calculation of the certainty factor of formalin and borax in food has a confidence level of 58.99182%.

Discussion

Based on the tests carried out, by testing of 8 symptoms, the results obtained by the level of confidence based on the conclusion table as follows:

Table 3. Percentage of Conclusions

Percentage rate	*Confidence Value*
0%-50%	Little chance or little chance
51%-79%	Possibility
80%-99%	Most likely
100%	Very confident

Based on the table above, the results of the test with the CF method of 58.9% with the conclusion of possibility, thus the results obtained are emphasized still in consultation with the doctor, because the value obtained in the calculation analysis is only a temporary decision.

4. Conclusion

Based on the research conducted, it was obtained Some things that can be observed in the development of uncertainty consultation media in the identification of formalin and borax in meatballs are as follows, including the presence of an expert system with the certainty factor method, so that people can find out the characteristics of formalin meatballs without meeting directly with expert doctors or experts. Likewise for designing expert system applications to identify food hazards in Formalin and Borax can use Visual Studio 2010 Applications

Reference

[1] EP Gunawan and R. Wardoyo, "An Expert System Using Certainty Factor for Determining Insomnia Acupoint," *IJCCS (Indonesian J. Comput. Cybern. Syst.*, vol. 12, no. 2, p. 119, 2018, doi:10.22146/ijccs.26328.

[2] V. Mayora, B. Ginting, and FA Sianturi, "LABORATORY USING SIMPLE ADDITIVE WEIGHTING (SAW) METHOD IN GRANMED HOSPITAL," *J. Inform. Nusant lamp.*, vol. 4, no. 2, pp. 1–7, 2019, [Online]. Available: http://e-jurnal.pelitanusantara.ac.id/index.php/JIPN/article/view/606.

[3] B. Sasangka and A. Witanti, "Expert System for Diagnosing Acute Respiratory Infections in Children Using Bayes' Theorem," *JMAI (Jurnal Multimed. Artif. Intell.*, 2019, doi:10.26486/jmai.v3i2.83.

[4] JT Informatics, T. Informatics, SI Industri, T. Informatika, and PC Riau, "Expert System for Diagnosing Kidney Disease Using Methods," *Sis. Experts in Diagnosing Kidney Disease Using the Method. Hill Climbing*, 2012.

[5] T. Hidayat, HN Nasution, SWR Nasution, and R. Fauzi, "EXPERT SYSTEMS TO DIAGNOSE LUPUS DISEASE USING CERTAINTY FACTOR METHOD," *J. Educ. Dev.*, 2019, doi:10.37081/ed.v7i3.1201.

[6] B. Sinaga, PM Hasugian, and AM Manurung, "Expert System Diagnosing Smartphone Damage," vol. 3, no. 1, pp. 333–339, 2018.

[7] W. Purba, D. Ujung, T. Wahyuni, L. Sihaloho, and J. Damanik, "DESIGNING ONLINE TICKET BOOKING INFORMATION SYSTEMS AT KMP . IHAN BATAK BASED," vol. 3, no. 2, pp. 65–75, 2020.

[8] RA Ramadhani, "Expert System for Hepatitis Diagnosis Using the K-NN Method for Primary Health Services," no. November, 2017.

[9] AJ Aziz Amrullah and E. Ekojono, "EXPERT SYSTEM FOR DIAGNOSIS OF LUNG DISEASE WITH FORWARD CHAINING METHOD," *J. Inform. Polynema*, 2017, doi:10.33795/jip.v2i1.48.

[10] Minarni and A. Fadhillah, "Expert System in Detecting Rice Plant Diseases," *J. Dyn.*, vol. 2, no. 1, pp. 11–15, 2017, doi:10.22216/JoD.2017.V2.11-15.

[11] D. Kiray and FA Sianturi, "Diagnose Expert System Computer Malfunction Certainty Factor Method," *J. Comput. Networks, Archit. High Performance. Comput.*, 2020, doi:10,47709/cnapc.v2i1.358.