

A Soft Computing Technique For Diagnose Psychological Disorder at Different Stages

Sandeep Kaur 1 , Prabhsharan Kaur 2

1M.Tech Scholar CSE Dept, NWIET Dhudike, Moga, India
2Assistant Professor CSE Dept, NWIET Dhudike, Moga, India
Corresponding author: Sandeep Kaur

Abstract—The Mental Illness Diagnostic Expert System Is Designed To Help Or Assist The Psychology Doctors To Diagnosing The Various Mental Disorders Related To Human. This Expert System Can Be Used To Perform Some Evaluation Of Patient's Physical And Emotional Symptoms To Diagnose The Particular Disorder. This Expert System Handles The Various Types Of Pathologies That More Often Appear As Anxiety Disorder, Mood Disorder, Psychotic Disorder, Impulse Control Disorder, Eating Disorder And Personality Disorder Causing A Micro Level Damage To Individual. This Expert System Uses Three AI Techniques: Fuzzy Generator, Fuzzy Logic And Rule Based Reasoning. We Are Going To Describe A New Method For Creating A Weighted Fuzzy Rule To Deal With The Mental Illness. The Fuzzy Rule Is A Causal Rule. Its IF Part Truly Cause The THEN. The Knowledge Of Human Expert System In The Area Of Mental Ill And Disorder Is Transformed And Often Encoded Into The Knowledgebase Using A Fuzzy Logic And Then Provide The Severity Of Any Particular Disorder. The Main Objective Of This Paper Is To Develop An Expert System Which Deals With The Various Disorders Related To Psychology.

Keywords— Fuzzy Reasoning; Expert System; Diagnose The Psychological Disorder With Physical And Emotional Symptoms.

Date of Submission: 24-03-2018

Date of acceptance: 09-04-2018

I. INTRODUCTION

Mental Issue Is A Transform Of Mental Or Behavioural Design That Makes Sufferings What's More Debilitates The Capacity To Work Previously, Ordinary Existence. In Psychopathology, Those Appraisal Techniques From Claiming Mental Issue Hold Different Sorts From Claiming Uncertainties Connected With Indications Also Side Effects. This Contemplate Identifies A Strategy That Addresses Those Issue From Claiming Questionable Matter Done Surveying Mental Issue.

In Medical Field The Diagnosis Is The Process Of Recognition Of A Disease Based On The Some Physical And Emotional Symptoms Of The Patient That Appears. The Major Issue Involve In The Diagnosis Is Risk Factor. This Midexs Takes The Primary Sign And Symptoms Of The Patient Whether The Symptoms Are Physical Or Emotional. This Expert Diagnose The Disorders Like Anxiety Disorder, Mood Disorder, Psychotic Disorder, Impulse Control Disorder, Eating Disorder And Personality Disorder. The Relationship Between Cause And Symptoms Of The Patient To Create The Number Of Hierarchical Set Of Rules And These Rules Are Used To Create Knowledgebase That Will Help The Doctors To Diagnose The Particular Psychology Disorder.

Some Types Of Psychology Disorder Leads To The Nerve System Of Individuals. It Is Very Common To Observe That How People React That When A Person Suffers From A Psychological Disorder. There Are Some Common Types Of Psychology Disorders Are Related To The Nervous System. Such Disorders Lead To The Damage Of Impulse And Nerve System And Affect The Critical Thinking And Memory Capacity Of The Person. The Resources Need Binding Of The Individual In Social Area [1]. The Major Difficulty In Diagnosing The Psychology Disorder Is That Whether A Person Really Suffering From The Psychology Disorder, Although These Symptoms Are Very Mall. This System Will Take Symptoms As Input And On The Basis Of These Physical And Emotional Symptoms It Will Diagnose The Disorder. This Expert System Will Not Only Simplify The Task Of Psychologist Doctors But Also Assist The Patient.

II. Related Work

In 2000 Roland, Proc Amharic Annu Fall Symp Settling On A Precise Also Far Reaching Psychiatric Assessment About Mental Issue On An Tolerant Could Be A Rather Perplexing Also Directing, Including Methodology. We Portray A Master System, MILP, Which Will Be Intended To Prepare Such Precise Diagnoses Of Mental Issue Utilizing Chose Classifications Starting With The Order

What's More Symptomatic Rules Distributed Previously, DSM-III-R, DSM-IV Furthermore ICD-10 [2]. Later In 2005, K. Morgan C. An. Brebbia & A Voiskounsky Present An Master Framework Model That Is Intended To Help Psychologists Done Finding Crazy What Issue Their Customers May Bring. The Master Framework Gives An Client Interface That Permits Those Therapist Should Enter An Expansive Assortment About Indications. Those Manifestations Need Aid Interfaced To A Database The Place Records About These Symptoms/Symptom Combinations And Additionally Their Underlying Issue Need Aid Put Away [3]. Those Framework Gives Fluffy As Opposed Deterministic Reaction.

In 2009 Luciano Comin Nunes; Placido Rogerio Pinheiro Studies On Mental Issue Have Kept Away Also Debilitated Experts In Distinctive Parts For Exercises. Those Mossy Cup Oak Genuine Issues Might Be Connected With Different Sorts For Pathologies, However, It Appears, A Greater Amount Often, Similarly As Psychotic Disorders, Temperament Disorders, Uneasiness Disorders, Introverted Personality, Different Identity Also Addiction, Making An Micro Level Harm Of The Single Person Furthermore His/Her Crew And On An Macro Level Of The Handling Framework And The Particular Nation Welfare. Anna Yankovskaya, Sergei Kitler In 2013 Portray Mental Issue Symptomatic Framework In View Of Logical-Combinatorial Systems From Claiming Example Distinguishment Called As Those Canny Framework DIAPROD-LOG [4]. That Framework May Be Outlined To Diagnostics What's More Counteractive Action From Claiming Misery. Those Scientific Mechanical Assembly For Formation Of The Suggested Framework Dependent Upon An Grid Model About Information What's More Learning Representation, And Also Different Sorts Of Regularities Previously, Information Furthermore Information Would Exhibited. Those Depiction Of The Framework May Be Provided For.

Subhagatachattopadhyay In 2017 Present The Work On Depression. Melancholy May Be Acknowledged With Make A Unending Temperament Confusion. This Paper Endeavors With Mathematically Model How Psychiatrists Clinically Recognize The Indications Etcetera Diagnose Gloom States. As Stated By Symptomatic What's More Measurable Manual (DSM)-IV-TR, Fourteen Indications Of Grown-Up Misery Have Been Acknowledged. The Load From Claiming Each Manifestation And The Relating Seriousness For Dejection Would Measured Toward The Psychiatrists [5]. Utilizing Those Central Part Examination (PCA) Out About Fourteen Manifestations (As Features) Seven Need Been Concentrated Likewise Idle Variables. Utilizing These Characteristics Likewise Inputs, A Mixture Framework Comprising Of Mamdani's Fluffy Rationale Controller (FLC) On A Encourage Ahead Multilayer Neural Net (FFMNN) Need Been Produced.

III. Research Gap

Conducting An Exhaustive Literature Review Is Your First Step. As I Search For Journal Articles, I Need To Read Critically Across The Breadth Of The Literature To Identify These Gaps. My Research Goal Was To Find A 'Space' Or Opening For Contributing New Research. The First Step Was Gathering A Broad Range Of Research Articles On My Research Topic. I Also Look For Research That Approaches The Topic From A Variety Of Methods – Qualitative, Quantitative, Or Mixed Methods To Find The Problems. This Is An Excellent Source For Learning About Research Methodology [6].

Mental Diagnose Worth From Claiming Exertion Proposes Using Fuzzy Method Of Reasoning Skeleton Arrangement. Maladjustment Diagnoses Frameworks Indigent Upon The Individuals Fuzzy Situated Starting With Asserting Norms. Fuzzy Method Of Reasoning May Have Been Right Away Made In The End Tom's Examining Zahed [7]. A Overview To Existing Investigate On The Cerebrum Science Issue Likewise Its Framework From Guaranteeing Organization To Fuzzy Method Of Reasoning Were Passed On Insane.

Those Disarranges Have Brought About Harm In A Micro Level To The Individual And His/Her Family And In A Macro Level To The Monetary And Generation Arrangement Of The Nation. The Absence Of Right On Time And Now And Then Late Finding Has Given Responsive Measures, When The Expert Is As Of Now Hinting At Mental Inadequacy To Work. This Study Means To Help The Early Determination Of Psychotics' Issue With A Half And Half Proposition Of A Specialist Framework That Is Coordinated To Organized Systems In Choice Backing And Learning Organized Representations Into Generation Guidelines And Probabilities. In The Arrangement Of Mental Issue, The Maniacal Issue Is All The More Weakening, Portrayed By Practices As Those At Schizophrenia [8]. An Awful Outcome For A Person Who Is Experiencing Insane Clutters Is The Picture Of Shortcoming That The Individual Presents For The General Public In Which He Lives. This Model Portrays Regular Examples Of Conduct, Thought, And Feeling, Permitting Arranging The Conclusion.

For Therapeutic Diagnose This Is Time Permits To Make Functioned With Those Assertion, Accurate Definition What's More Portrayals. Fuzzy Rationale Makes Diagnose Time Permits Should Define Those Accurate Characterizing Medicinal Substances As Fuzzy Set. Fuzzy Rationale Gives Those Capable Thinking Procedure That Handles The Loose And Uncertainties To Information On Diagnose

Mental Issue [9]. There Will Be Really Infrequently Sharp Limit Between Those Different Mental Issues. Mental Confusion Is Those Best Example, On Their Need Aid An Extensive Amount Of Physical What's More Passionate Manifestations That Are Ambiguous. The Association Between Sign And Side Effects What's More Maladies Are Investigated. Same Time Intricacy Of The Framework Is Increased; It Is Not Difficult On Take That Specific Way In Which Determination May Be Deduced. Fuzzy Master Framework Assumes A Paramount Part Done Restorative Field. Managing Improvement From Claiming Master Framework Also Diagnose Choice One Is Altogether Rely On Upon Those Caliber Of Information. It May Be Exceptionally Imperative To That How Will Depict Those Conduct Technique And Properties For Quantitatively Furthermore Qualitatively [10]. This Master Framework Separated Under Modules: ANXITETY, MOOD, PSYCHOTIC, EATING, IMPULSE CONTROL And PERSONALITY DISORDERS.

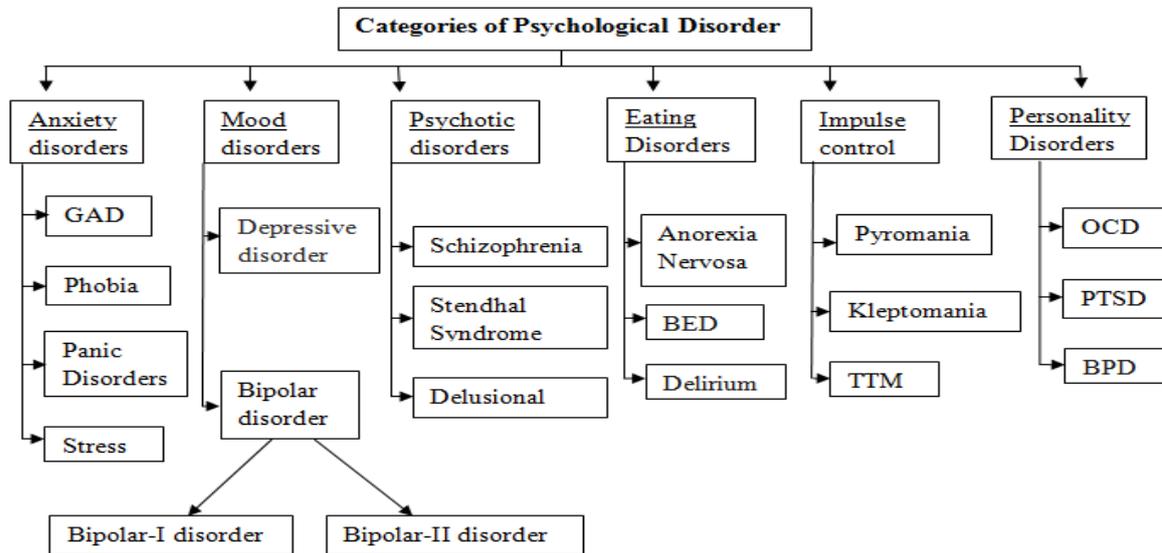


Figure 1 - Categories Of Psychological Disorders

IV. Research Objectives

The Main Objective Of Our Research Is To Develop A Decision Support System Related To Different Parts Of The Body That Means This Expert System Will Deal With The Various Specialists For Detecting The Disorder. Due To Non Availability Of The Expert In Remote Areas, Most Of The Patient Suffers From Some Danger Disorder. Some Time Patient's Life In Danger. And May Lead To Death Because Of The Improper Diagnosis Of The Disorder And Treatment Of Those Disorders. This Expert System Will Very Help:

1. To Develop A Solid Research Foundation And Comprehension Of The Logical Establishment Of Brain Science.
2. To Build Up An Information Base Of Human Conduct Over The Wide Zones Of Brain Research And Become Aware Of The Applications Of Psychology In The Professions Associated With Psychology.
3. To Analyze Various Measuring Parameters (Physical & Emotional Symptoms) With Accuracy Dependency Of The Expert System.
4. Defining Psychological Disorders Allows Psychologists To Treat Clients Effectively.

V. Research Methodology

Mental Diagnose Work Proposes Using Fuzzy Logic System Design And Simulation. Mental Illness Diagnoses Systems Based On The Fuzzy Set Of Rules. Fuzzy Logic Was Initially Developed By Zahed. A Review Of Existing Research On The Psychology Disorders And Its Strategy Of Management With Fuzzy Logic Were Carried Out. The Word Psychology Word I Is Origin From The Two Greek Words 'Psyche' And 'Logos'[11]. The Word Psyche Means To The Soul And Logos Means To The Study. In This Research The Psychology Disorders From A Combined Dangerous Effect Of Various Disorders Related To The Impulse Control Disorder, Anxiety Disorder, Mood Disorder, Eating Disorder. Fuzzy Sets Are The Artificial Techniques That Provide The Appropriate Solution The Particular Problems. Fuzzy Logic Deals With The Real World Problems In Which Data Is Not Precise Or Accurate. Fuzzy Logic Is Based On The Reasoning. The Fuzzy Rule Is A Causal Rule; It Means Whose IF Part Truly Causes The THEN Part [12].

The Efficiency Of System Is Determine By The Choice Of Membership Function That Is Used For Every Input And Output Parameters. There Are Various Symptoms That Do Not Have A Particular Values And The Membership Function Are Chosen For Each Of The Parameter Which Is Used. These Membership Values Are Taken On The Basis Of Intuition Method. Besides The Number Of Membership Function Used There Are Some Another Factors Need To Be Take Account And These Factors Are The Conjunction, Disjunction, Aggregation, Type Of Parameters And The Range Of The Parameters[13]. The Characteristic Of Each Fuzzy Variable Is Represented Using Trapezoidal (For The Input Variables Such As Symptoms) And The Triangular (For The Outputs) And. In This Study, The Fuzzy Set Represented By A Number Of Membership Function.

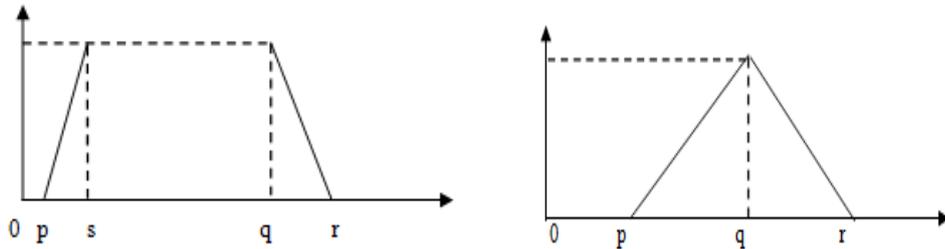


Figure 2 - A. Trapezoidal Membership Function

B. Triangular Membership Functions

In Medical Diagnose This Is Possible To Be Worked With The Assertion, Exact Definition And Descriptions. Fuzzy Logic Makes Diagnose Possible To Define The Exact Defining Medical Entities As Fuzzy Set. Fuzzy Logic Provides The Powerful Reasoning Technique That Handles The Imprecise And Uncertainties In Data To Diagnose Mental Disorders. In This Create The Following Phases –

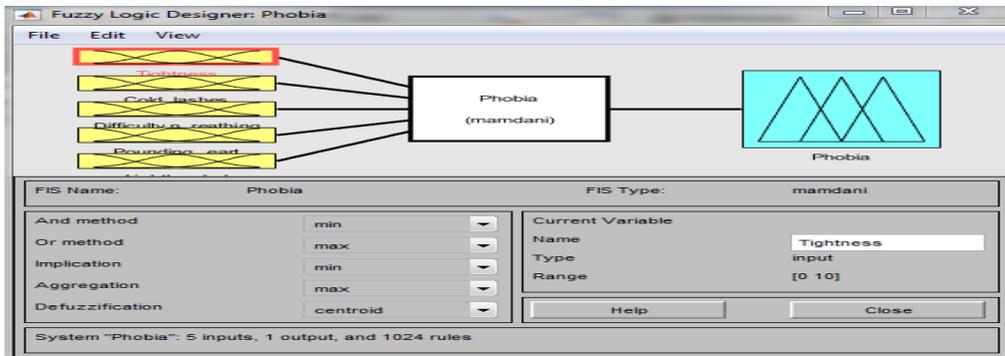


Figure 3 - FIS Of Phobia Disorder

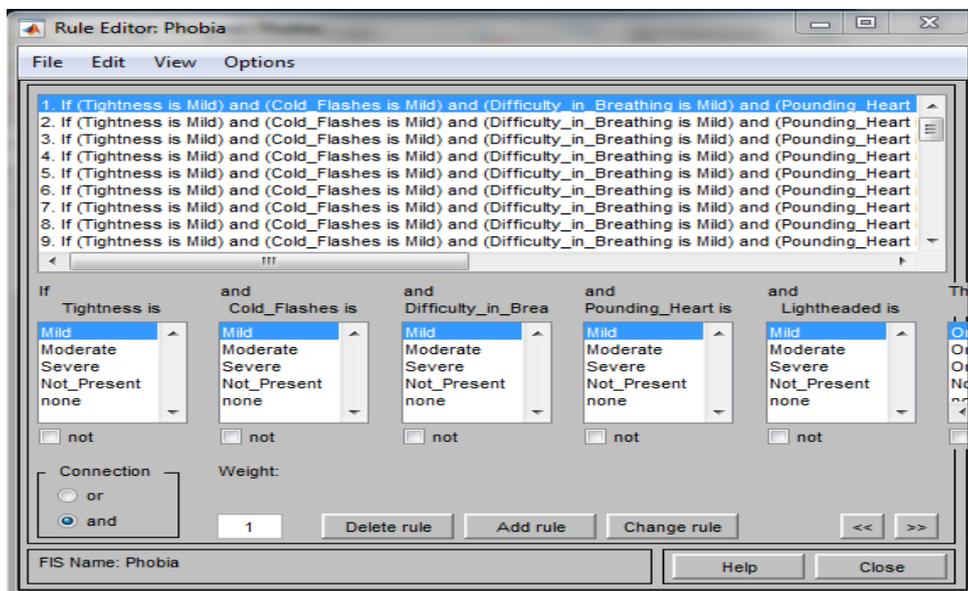


Figure 4 – Rule Editor Of Phobia Disorder

VI. RESULTS AND DISCUSSIONS

We Can Diagnosis The Results From The Experience Or Observation And The Sign And Symptoms Of The Patient. If We Examine The Procedure Which Is Followed By The Physicians To Identifying The Disease, That Is The Simpler Method. Some Symptoms Are Occurring At A High Range Or Other Are Occur At Low Or Moderate Range.

In This Study We Main Think About Four Labels: Not Present, Mild, Moderate, And Severe. Place The Perception Takes Between 0 To 10. We Consider Membership Function For Not Present-0, Mild Is 1-3, Moderate Is 4-7, And Severe Is 7-10. The Psychological Disorder Is At 1st Stage If The Most Of Input Symptoms In Mild Range(1-3), Disorder At 2nd Stage If The Most Of Inputs In Moderate Range(4-7) And The Disorder Is At Final Or 3rd Stage If The Most Of Symptoms In High Range (7-10). We Acquire The Correctness Of The Experiments And Calculation Expense Will Be Fraction Of Seconds.

Input	
Physical Symptoms	
Fatigue	5
Muscle Tension	8
Difficulty in Breathing	5
Restlessness	9
Difficulty in Concentrating	5
Chest Pain	0
Dizziness	0
Sweating	0
Trembling /Shaking	0
Cold Flashes	0
Lightheaded	0
Tightness	0
Pounding Heart	0
Diarrhea	0
Nausea	0
Frequent Colds	0
Aches	0
Fainting	0
Confusion	1

Output
Generalised Anxitey Disorder on 2nd Stage
Panic Disorder is not Present
Phobia Disorder is not Present
Stress Disorder is not Present
Stendhal Syndrome Disorder is not Present

Final Result

You are suffering from Generalised Anxitey Disorder that is on SECOND STAGE.
You need to consult your Doctor for your treatment.

Figure 5- Final GUI Of Psychological Expert System To Diagnose Diseases Using Physical Symptoms

Figure 6- Final GUI Of Psychological Expert System To Diagnose Disorders Using Emotional Symptoms

VII. CONCLUSIONS

In This Paper There Is A Development Of Fuzzy Mental Diagnose Expert System. This System Takes The Input As Physical And Emotional Symptom Of The Patient And Diagnoses The Particular Disorder Related To The Psychology Disorder. This System Can Be Used By Physician In Daily Practice To Diagnose The Disorder Easily. This System Allow The Doctor To Follow Their Natural Process For Diagnose. This System Does Not Learn Any New Procedure Or Method Of Doing Things. A Lot Of Research Has Been Done In Medical Field But More Research Increase The Accuracy Of The System. So Many Properties Of This System Remain To Investigate.

The Survey Of Various Expert Systems Concludes That Different Techniques Having Own Advantages And Disadvantages. The Study Shows That Diagnose Psychological Disorder Using Fuzzy Rule Base Technique Is Suitable For Implementation. However This Expert System Has Some Drawbacks That Can Be Overcome By Adding Some Other Features In Future.

REFERENCES

- [1] Honkus VL ; Sleep –Deprivation In Critical Care Units; Critical Care Nursing Quarterly 26 179-91;2003
- [2] Braverman E R, Pfeifer C C, Blum K And Smayda R ; The Healing Nutrients Within: Facts,Findings, And New Research On Amino Acids (Basic Health Publications, Inc.);2000
- [3] Ancoli-Israel S And Cooke J R; Prevalence And Comorbidity Of Insomnia And Effect On Functioning In Elderly Populations; Journal Of The American Geriatrics Society 53 S264-S271;2005
- [4] Ms.S.Sapna,Dr.A.Tamilarasi; Fuzzy Relational Equation In Preventing Diabetic Heart Attack; International Conference On Advances In Recent Technologies In Communication And Computing;2009.
- [5] Ford D E And Kamerow D B ; Epidemiologic Study Of Sleep Disturbances And Psychiatric Disorders:An Opportunity For Prevention? ; Jama 262 1479-84;1989
- [6] Lin C C, Chen V, Yu C C, Lin Y C Et Al; Proceedings Of The 7th WSEAS InternationalConference On Fuzzy Systems (World Scientific And Engineering Academy And Society(WSEAS)) Pp 49-54;2006
- [7] Cheung W W, Pitcher T J And Pauly D ; A Fuzzy Logic Expert System To Estimate Intrinsic Extinction Vulnerabilities Of Marine Fishes To Fishing ; Biological Conservation 124(1): 97-111;2005
- [8] L. Zadeh; Fuzzy Sets; Information And Control 8 338-53;1965
- [9] Riza L, Bergmeir C, Herrera F And Benítez J ; Fuzzy Rule-Based Systems For Classification And Regression In R; Journal Of Statistical Software 65 1-30;2015
- [10] Zadeh L; The Concept Of Linguistic Variable And Its Application To Approximate Reasoning; Information Sciences Volume 8 199-249; 1975

- [11] Chi Z, Yan H And Pham T ;Fuzzy Algorithms: With Applications To Image Processing AndPattern Recognition Vol 10 (World Scientific);1996
- [12] Riza L S, Bergmeir C, Herrera F And Benítez J M; Constructing Fuzzy Rule Based Systems With The R Package “Frbs” ; IEEE International Conference On Fuzzy Systems (FUZZ-IEEE) Pp 2149-55; 2014
- [13] Riza L S, Janusz A, Bergmeir C, Cornelis C, Herrera F, Ślezak D And Benítez J M ;Information Sciences 287 68-89;2014.

Sandeep Kaur "A Soft Computing Technique For Diagnose Psychological Disorder at Different Stages"International Journal of Engineering Science Invention (IJESI), vol. 07, no. 04, 2018, pp 48-54