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Computing Methods for Categorization of Buyer and seller agent in B2C

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Abstract
Categorization orclassification is one of the important tasks in negotiation between buyer and seller(BS), in B2C E-commerce. It is preassumed that negotiation between same category of buyer and seller isan appropriate approach**.** We have deployed a some computing models asBayesian, Naive Bayes, Logistics, SMA and Ada boost method for classification of BS.We have taken some cognitive and business parameters for categorization of BS agent as Outstanding, excellent,very good,good and average.Highest accuracy 98% and lowest accuracy 77% have been obtained from Bayes network and SMO respectively. Other methods havethe accuracy in between them.

1. Introduction

In the negotiation between buyer and seller the categorization of Buyer and Sellers(BS) is very important issue in B2C E -commerce Datamining and of the intelligent computing methods as ANN and GA have been deployed in this context..Shoham(1) defines an agent to be “an entity whose state is viewed as consisting of mental components such as beliefs, capabilities, choices, and commitments (Shoham, 1993). A generic classification of an agent’s attitudes is defined as follows: Informational attitudes i.e. Knowledge and Beliefs, Motivational attitudes i.e. Desires and Intentions Commitments. Mazumdar and Mishra (5.6) used Data mining methods to classify and categorize the BS on the basis of their attributes used for negotiation

Gleizes (3) described their research into flexible, agent-based negotiation in e-commerce systems. They built an experimental multi-player shopping game, in which agents will represent buyers, sellers, brokers and services of various kinds.Agents can use the latest web-based technologies, XML

Leea (4) has proposed multiple-attributes negotiation model for B2C e-commerce, which deploys intelligent agents to facilitate autonomous and automatic on-line buying and selling by intelligent agents while quickly responding to consumersbased on cognitive parameters and business parameters. The 17 parameters and five categories are based on the literature and various business organizations Carter et al(.2) Data mining (DM) based computing methods as given in this paper helps to extract and analyze the meaningful relationship between various cognitive and business parameters and it also provides the relative importance of various methods based on 100records. Tthese parameters profit, quality, quantity, brand, serving time, start time payment mode, loyalties etc. are important business parameters

The problem is firstly described by collecting information 17different cognitive and business parameters focusing on the category of agent.

In this paper we have deployed Bayesian, Nave Bayes, Logistics, and SMA and Ada boost method for classification of BS.

2. Computing Methods

An introductory statement for various computing methods is given below:

Bayesian Network (10)

Bayesian network is a probabilistic directed acyclic graph composed of a set of nodes and a set of edges between nodes. Nodes represent the random data and edge between two nodes represents conditional dependency among nodes. Learning the process of Bayesian network is a two-step process: learning network, learning relationship

Logistic (11):

Logistic classification applies to the data set where dependent and independent attribute are dichotomous. The data set used for depression prediction has binary outcome so it cannot be modeled using linear regression. For such data logistic regression is required. The logistic function is used in this model to predict the output of an experiment.

$$f(x) = \frac{1}{1 + e^{-x}}$$

Naive Bayes (7)

The naive Bayes classifier applies to learning tasks where each instance $\boldsymbol{x}$ is described by a conjunction of attribute values and where the target function f $\boldsymbol{(x)}$ can take on any value from some finite set V. A set of training examples of the target function is provided, and a new instance is presented, described by the tuple of attribute values $(\boldsymbol{a_1}, \boldsymbol{a_2} \ldots \boldsymbol{a_n})$. The learner is asked to predict the target value, or classification, for this new instance.

Ada-Boost Classifier (9):

Boosting refers to a general and provably effective method of producing a very accurate prediction rule by combining rough and moderately inaccurate rules of thumb. Boosting has its roots in a theoretical framework for studying machine learning called the ―PAC learning model.

Sequential Minimal Optimization (SMO) (8):

SMO solves the SVM-QP (support vector machine quadratic programming) problem by decomposing it into SVM-QP Sub-problems and solving the smallest possible optimization problem, involving the two Lagrange multipliers, at each step. A Quadratic Problem is maximizing or minimizing a quadratic objective function subject to a set of linear constraints.

3. **Data set preparation:** The data set is prepared for the cognitive as well business parameters as given below in table1

Table1: Cognitive and Business Parameters

(X1)	PERFORMANCE		
(X2)	PROFIT	(X11)	CAPABILITY
(X3)	QUALITY	(X12)	REPUTATION
(X4)	BRAND	(X13)	RELIABILITY
(X5)	SERVICE TIME	(X14)	START TIME
(X6)	BELIEF	(X15)	LOYALTY
(X7)	DESIRE	(X16)	SUPPORT
(X8)	INTENTION	(X17)	SELF MONITORING
(X9)	PREFERENCE		
(X10)	COMMITMENT		

We have taken 100 instances of the data set for categorization of buyer and seller (BS) agents

Table 2: Data set for BS

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	Score	CATE
0.6	0.6	0.5	0.7	2.7	0.8	0.6	0.7	0.9	0.8	0.5	0.6	1	0.5	0.5	0.9	0.9	0.7	Very Good
0.3	0.6	0.5	0.6	4.2	1	0.5	0.4	1	0.3	0.6	0.9	0.4	0.5	0.3	0.8	0.9	0.8	Very Good
0.6	0.8	0.9	0.7	3	0.3	0.7	0.8	0.9	0.6	0.8	0.9	1	0.8	0.2	0.5	0.6	0.7	Very Good
0.2	0.6	0.5	0.5	4.2	0.3	0.9	0.5	0.6	0.7	0.8	0.6	0.3	0.5	0.6	0.7	0.5	0.7	Very Good
0.9	0.9	0.9	0.6	2.7	0.6	0.4	0.7	0.6	0.9	1	0.5	0.6	0.5	1	0.3	0.6	0.6	Good
0.7	0.8	0.5	0.8	2.7	1	0.6	0.3	0.4	0.6	0.9	0.3	0.4	0.7	0.6	0.8	0.3	0.9	Excellent
0.3	0.6	0.9	0.8	4.2	0.3	0.5	0.9	0.8	0.3	1	0.6	0.7	0.5	0.3	0.4	0.3	1	Outstanding
0.3	0.6	0.9	0.5	2.7	0.3	0.4	0.5	0.6	0.3	0.4	0.6	0.8	0.5	0.2	0.7	1	0.6	Good
0.7	0.8	0.5	0.6	2.7	0.3	0.8	0.7	0.6	0.9	0.3	0.6	0.3	0.5	0.6	0.6	0.7	0.6	Good
0.1	0.6	0.5	0.6	3	0.6	0.8	0.9	0.4	0.6	0.3	0.9	0.7	0.8	0.8	0.9	0.7	0.7	Very Good
0.6	0.7	0.6	0.8	2.7	0.9	0.5	0.6	0.8	0.4	0.6	0.4	0.9	0.5	0.4	0.5	0.6	0.7	Very Good
0.2	0.3	0.6	0.4	4.2	1	0.6	0.8	0.9	0.4	0.6	0.5	0.6	0.5	0.9	0.4	0.6	0.8	Very Good
0.5	0.6	0.8	0.7	3	0.5	0.9	0.8	0.4	0.6	0.4	0.9	1	0.6	0.8	0.6	0.7	0.7	Very Good
0.6	0.8	0.9	0.8	4.2	0.5	0.6	0.8	0.6	0.8	1	0.6	0.4	0.8	0.9	0.2	0.1	0.8	Very Good
1	0.8	0.9	0.4	2.7	0.6	0.5	0.8	0.9	0.2	0.9	0.5	0.3	0.2	0.4	0.8	0.6	0.7	Very Good
0.9	0.4	0.6	0.5	2.7	0.4	0.6	0.8	0.9	0.5	0.6	0.7	0.9	0.8	0.6	0.9	0.5	0.7	Very Good
0.4	0.6	0.8	0.5	4.2	0.9	0.4	0.6	0.9	0.7	1	0.6	0.5	0.8	0.6	0.4	0.1	0.8	Very Good
0.8	0.6	0.2	0.5	2.7	0.6	0.8	0.9	0.4	0.6	0.5	0.2	0.1	0.5	0.8	0.4	0.9	0.7	Very Good
0.6	0.5	0.9	0.6	2.7	0.6	0.8	0.2	0.3	0.9	0.4	0.5	0.6	0.8	0.6	0.2	0.7	0.6	Good
0.6	0.8	0.2	0.4	3	0.6	0.3	0.3	0.1	0.2	0.3	0.4	0.5	0.4	0.5	0.1	0.2	0.5	Good
0.7	0.6	0.5	0.5	2.7	0.6	0.4	0.9	0.5	0.5	0.4	0.6	0.9	0.5	0.1	0.6	1	0.6	Good
0.5	0.5	0.7	0.8	4.2	0.9	0.5	0.3	0.6	0.7	0.8	0.9	0.4	0.5	0.6	0.3	0.9	0.7	Very Good
0.6	0.5	0.8	0.9	3	0.3	0.9	0.5	0.8	0.6	0.4	0.9	0.7	0.6	0.8	0.9	0.2	0.7	Very Good
0.5	0.6	0.4	0.9	4.2	0.2	0.5	0.6	0.9	0.8	0.7	0.4	0.5	0.9	0.8	0.8	0.9	0.6	Good
0.9	1	0.8	0.9	2.7	0.5	0.6	0.7	0.8	0.9	0.8	0.2	0.3	0.1	0.2	0.6	0.8	0.5	Good
0.6	0.8	0.8	0.9	2.7	1	0.5	0.9	0.4	0.5	0.6	0.8	0.4	0.8	0.8	0.9	0.4	0.8	Very Good
0.9	0.5	0.3	0.1	4.2	0.6	0.9	0.5	0.8	0.6	0.4	0.9	0.1	0.5	0.5	0.8	0.2	0.8	Very Good
0.6	0.6	0.7	0.8	2.7	0.9	0.9	0.8	0.4	0.6	0.1	0.5	0.8	0.7	0.5	0.9	0.9	0.7	Very Good
0.8	0.7	0.9	0.5	2.7	0.6	0.8	0.9	0.5	0.2	0.6	0.9	0.4	0.8	0.5	0.6	0.7	0.6	Good
0.9	0.8	0.9	0.9	3	0.7	0.5	0.5	0.9	0.9	0.8	0.7	0.9	0.5	0.8	0.9	0.8	0.5	Good
0.6	0.7	0.8	0.7	2.7	0.9	0.8	0.9	0.9	0.5	0.9	0.5	0.6	0.4	0.8	0.9	0.3	0.4	Average
0.5	0.6	0.8	0.9	4.2	0.4	0.5	0.6	0.9	0.8	0.7	0.6	0.2	0.1	0.5	0.6	0.9	0.3	Average
0.8	0.9	0.8	0.6	3	0.6	0.7	0.9	0.5	0.6	0.6	0.5	0.1	0.3	0.6	0.4	0.9	0.8	Very Good
0.8	0.9	0.5	0.6	4.2	0.5	0.6	0.3	0.4	0.9	0.7	0.8	0.5	0.6	0.5	0.6	0.2	0.7	Very Good
0.9	0.8	0.7	0.6	2.7	0.6	0.5	0.8	0.7	0.9	0.4	0.5	0.8	0.7	0.9	0.5	0.7	0.7	Very Good
0.7	0.6	0.8	0.9	2.7	0.8	0.9	0.7	0.5	0.4	0.6	0.5	0.5	0.8	0.9	0.1	0.2	0.8	Very Good
0.3	0.9	0.5	0.8	4.2	0.3	0.5	0.9	0.9	0.5	0.1	0.5	0.6	0.9	0.5	0.2	0.1	0.4	Average
0.3	0.6	0.9	0.5	2.7	0.3	0.4	0.5	0.6	0.3	0.4	0.6	0.8	0.5	0.2	0.7	1	0.7	Very Good
0.7	0.8	0.5	0.6	2.7	0.3	0.6	0.9	0.4	0.6	0.4	0.5	0.6	0.8	0.9	0.4	0.7	0.8	Very Good
0.9	0.5	0.8	0.7	3	0.6	0.8	0.9	0.4	0.7	0.5	0.3	0.6	0.1	0.2	0.5	0.7	0.6	Good
0.7	0.8	0.9	0.8	2.7	0.8	0.6	0.7	0.9	0.8	0.5	0.6	1	0.5	0.5	0.9	0.9	0.5	Good
0.4	0.7	0.5	0.6	4.2	1	0.5	0.4	1	0.8	0.9	0.8	0.9	0.5	0.6	0.8	0.9	0.7	Very Good
1	0.9	0.9	0.7	3	0.3	0.7	0.8	0.9	0.6	0.8	0.9	1	0.8	0.8	0.8	0.6	0.7	Very Good
0.6	0.6	0.8	0.9	4.2	0.3	0.4	0.5	0.6	0.9	0.7	0.1	0.5	0.1	0.2	0.8	0.9	0.8	Very Good
0.9	0.9	0.9	0.6	2.7	0.8	0.4	0.6	0.5	0.4	0.8	0.9	0.1	0.2	0.8	0.9	0.7	0.6	Good
0.7	0.8	0.5	0.8	2.7	1	0.6	0.3	0.4	0.6	0.9	0.3	0.4	0.7	0.6	0.8	0.3	0.5	Good
0.8	0.9	0.4	0.8	4.2	0.8	0.6	0.5	0.4	0.9	0.4	0.5	0.9	0.4	0.1	0.7	0.8	0.4	Average
0.9	0.6	0.8	0.5	2.7	0.7	0.8	0.9	0.4	0.5	0.6	0.1	0.8	0.8	0.8	0.9	0.1	0.9	Excellent
0.7	0.9	0.9	0.9	2.7	0.4	0.7	0.8	0.6	0.5	0.5	0.6	0.7	0.5	0.5	0.9	0.7	0.8	Very Good
0.1	0.6	0.5	0.6	3	0.6	0.8	0.9	0.4	0.6	0.3	0.9	0.7	0.8	0.8	0.9	0.7	0.7	Very Good
0.8	0.9	0.5	0.8	2.7	0.6	0.5	0.6	0.8	0.7	0.4	0.5	0.2	0.4	1	0.8	0.7	0.5	Good
0.5	0.6	0.8	0.9	4.2	0.4	0.5	0.6	0.9	0.8	0.7	0.3	0.2	0.9	0.8	0.4	0.2	0.6	Good
0.5	0.8	0.6	0.7	3	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.8	0.6	0.9	0.7	Very Good
0.8	0.9	0.5	0.6	4.2	0.8	0.6	0.9	0.8	0.9	0.8	0.8	0.6	0.5	0.5	0.9	1	0.8	Very Good

X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	Score	CATE
0.3	0.2	0.2	0.6	2.7	0.3	0.2	0.1	0.6	0.3	0.5	0.4	0.3	0.2	0.1	0.6	0.3	0.5	Good
0.7	0.6	0.5	0.6	2.7	0.6	0.5	0.4	0.6	0.5	0.4	0.6	0.5	0.4	0.6	0.5	0.4	0.7	Very Good
0.9	0.6	0.5	0.8	4.2	0.6	0.5	0.6	0.8	0.6	0.5	0.2	0.4	0.8	0.9	0.5	0.6	0.8	Very Good
0.9	0.6	0.9	0.8	2.7	0.4	0.5	0.6	0.6	0.9	0.8	0.7	0.6	0.5	0.8	0.8	0.9	0.6	Good
0.7	0.9	0.9	0.9	2.7	0.4	0.6	0.5	0.5	0.6	0.7	0.9	0.5	0.5	0.6	0.8	0.9	0.7	Very Good
0.5	0.6	0.4	0.9	3	0.8	0.7	0.6	0.5	0.4	0.3	0.5	0.9	0.8	0.8	0.4	0.5	0.7	Very Good
0.8	0.6	0.8	0.7	2.7	0.5	0.6	0.8	0.9	0.4	0.8	0.9	0.4	0.6	0.5	0.9	0.7	0.6	Good
0.3	0.2	0.6	0.5	4.2	0.3	0.5	0.4	0.6	0.8	0.9	0.9	1	0.9	1	0.9	0.8	0.8	Very Good
1	0.9	0.9	0.7	3	0.9	0.8	0.9	0.8	0.8	0.9	0.7	0.6	0.5	0.9	0.8	0.8	1	Outstanding
0.5	0.6	0.8	0.9	4.2	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.5	0.3	0.9	0.5	0.4	Average
0.9	0.9	0.9	0.8	2.7	0.8	0.7	0.6	0.5	0.4	0.9	0.8	0.8	0.8	0.8	0.4	0.8	0.9	Excellent
0.6	0.8	0.9	0.9	2.7	1	1	0.6	0.8	0.6	0.5	0.8	0.4	0.5	0.6	0.5	0.2	0.4	Average
0.6	0.5	0.8	0.9	4.2	0.5	0.6	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.1	0.8	0.4	0.7	Very Good
0.3	0.6	0.5	0.5	2.7	0.5	0.6	0.8	0.7	0.9	0.5	0.4	0.6	0.9	0.8	0.7	0.4	0.6	Good
0.7	0.9	0.9	0.9	2.7	0.4	0.7	0.8	0.6	0.5	0.5	0.6	0.7	0.5	0.5	0.9	0.7	0.6	Good
0.1	0.6	0.5	0.6	3	0.6	0.8	0.9	0.4	0.6	0.3	0.9	0.7	0.8	0.8	0.9	0.7	0.7	Very Good
0.6	0.7	0.6	0.8	2.7	0.9	0.5	0.6	0.8	0.4	0.6	0.4	0.9	0.5	0.4	0.5	0.6	0.4	Average
0.2	0.3	0.6	0.4	4.2	1	0.6	0.8	0.9	0.4	0.6	0.5	0.6	0.5	0.9	0.4	0.6	0.6	Good
0.8	0.6	0.9	0.7	3	0.5	0.9	0.8	0.4	0.6	0.4	0.9	1	0.6	0.8	0.6	0.7	0.8	Very Good
0.6	0.8	0.9	0.8	4.2	0.5	0.6	0.8	0.6	0.8	1	0.6	0.4	0.8	0.9	0.2	0.1	0.6	Good
1	0.8	0.9	0.4	2.7	0.6	0.5	0.8	0.9	0.2	0.9	0.5	0.3	0.2	0.4	0.8	0.6	0.5	Good
0.9	0.4	0.6	0.5	2.7	0.4	0.6	0.8	0.9	0.5	0.6	0.7	0.9	0.8	0.6	0.9	0.5	0.6	Good
0.4	0.6	0.8	0.5	4.2	0.9	0.4	0.6	0.9	0.7	1	0.6	0.5	0.8	0.6	0.4	0.1	0.5	Good
0.8	0.6	0.2	0.5	2.7	0.6	0.8	0.9	0.4	0.6	0.5	0.2	0.1	0.5	0.8	0.4	0.9	0.7	Very Good
0.6	0.5	0.9	0.6	2.7	0.6	0.8	0.2	0.3	0.9	0.4	0.5	0.6	0.8	0.6	0.2	0.7	0.4	Average
0.6	0.8	0.9	0.6	3	0.6	0.8	0.4	0.1	0.2	0.3	0.8	0.9	0.4	0.5	0.1	0.2	0.4	Average
0.7	0.8	0.9	0.8	2.7	0.8	0.6	0.7	0.9	0.8	0.5	0.6	1	0.5	0.5	0.9	0.9	0.7	Very Good
0.4	0.7	0.5	0.6	4.2	1	0.5	0.4	1	0.8	0.9	0.8	0.9	0.5	0.6	0.8	0.9	0.6	Good
1	0.9	0.9	0.7	3	0.3	0.7	0.8	0.9	0.6	0.8	0.9	1	0.8	0.8	0.8	0.6	0.8	Very Good
0.6	0.6	0.8	0.9	4.2	0.3	0.4	0.5	0.6	0.9	0.7	0.1	0.5	0.1	0.2	0.8	0.9	0.7	Very Good
0.1	0.6	0.5	0.6	2.7	0.3	0.4	0.4	0.5	0.4	0.2	0.5	0.5	0.6	0.4	0.6	0.7	0.4	Average
0.7	0.8	0.5	0.8	2.7	1	0.6	0.3	0.4	0.6	0.9	0.3	0.4	0.7	0.6	0.8	0.3	0.8	Very Good
0.8	0.9	0.4	0.8	4.2	0.8	0.6	0.5	0.4	0.9	0.4	0.5	0.9	0.4	0.1	0.7	0.8	0.6	Good
0.9	0.6	0.8	0.5	2.7	0.7	0.8	0.9	0.4	0.5	0.6	0.1	0.8	0.8	0.8	0.9	0.1	0.7	Very Good
0.7	0.9	0.9	0.9	2.7	0.4	0.7	0.8	0.6	0.5	0.5	0.6	0.7	0.5	0.5	0.9	0.7	0.8	Very Good
0.1	0.6	0.5	0.6	3	0.6	0.8	0.9	0.4	0.6	0.3	0.9	0.7	0.8	0.8	0.9	0.7	0.3	Average
0.6	0.6	0.5	0.7	2.7	0.8	0.6	0.7	0.9	0.8	0.5	0.6	1	0.5	0.5	0.9	0.9	0.6	Good
0.3	0.6	0.5	0.6	4.2	1	0.5	0.4	1	0.3	0.6	0.9	0.4	0.5	0.3	0.8	0.9	0.6	Good
0.1	0.2	0.3	0.7	3	0.3	0.7	0.5	0.6	0.4	0.4	0.2	0.6	0.5	0.2	0.4	0.5	0.4	Average
0.2	0.6	0.5	0.5	4.2	0.3	0.9	0.5	0.6	0.7	0.8	0.6	0.3	0.5	0.6	0.7	0.5	0.7	Very Good
0.9	0.9	0.9	0.6	2.7	0.6	0.4	0.7	0.6	0.9	1	1	1	0.9	1	0.9	0.6	0.9	Excellent
0.7	0.8	1	0.8	2.7	1	0.6	0.3	0.4	0.6	0.9	0.8	0.9	0.7	0.6	0.8	0.3	0.6	Good
0.3	0.6	0.6	0.5	4.2	0.3	0.5	0.4	0.8	0.3	1	0.6	0.2	0.5	0.3	0.4	0.3	0.5	Good
0.3	0.6	0.9	0.5	2.7	0.3	0.4	0.5	0.6	0.3	0.4	0.6	0.8	0.5	0.2	0.7	1	0.8	Very Good
0.7	0.8	0.5	0.6	2.7	0.3	0.8	0.7	0.6	0.9	0.3	0.6	0.3	0.5	0.6	0.6	0.7	0.7	Very Good
0.1	0.6	0.5	0.6	3	0.6	0.8	0.9	0.4	0.6	0.3	0.9	0.7	0.8	0.8	0.9	0.7	0.6	Good

4. Results

The computed results by different computing methods are given below.For the categorization of different types, the parameters in the column of tables3-8 are True positive (TP) rate, False positive(FP) rate,Precision,RecallF-measure, MCC, ROC area,PRC area

Table3: Bayes Network: Accuracy is 98.00%

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0.999	0.999	0.999	0.999	0.999	0.9999	0.924	0.999	Very Good
1.000	0.000	1.000	0.989	0.999	0.989	0.989	0.970	Good
1.000	0.000	1.000	1.000	1.000	.999	.989	0.978	Excellent
1.00	0.000	1.000	0.000	1.000	1.000	1.000	1.000	Outstanding
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	Average

Table4:Naive Bayes: Accuracy is 89.00%

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0.980	0.118	0.889	0.980	0.932	0.865	0.900	0.764	Very Good
0.909	0.010	0.938	0.909	0.923	0.886	0.990	0.983	Good
0.000	0.010	0.000	0.000	0.000	-0.021	0.878	0.200	Excellent
0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.020	Outstanding
0.917	0.023	0.846	0.917	0.880	0.864	0.996	0.975	Average

Table 5:Logistic Classifier:Accuracy is 81.00%

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0.878	0.059	0.935	0.878	0.905	0.821	0.927	0.884	Very Good
0.848	0.045	0.903	0.848	0.875	0.817	0.978	0.947	Good
0.250	0.042	0.200	0.250	0.222	0.187	0.858	0.259	Excellent
0.000	0.041	0.000	0.000	0.000	-0.029	0.107	0.017	Outstanding
0.750	0.057	0.643	0.750	0.692	0.649	0.973	0.873	Average

Table 6:AdaBoostM1 Classifier: Accuracy is 82.00%.

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1.000	0.118	0.891	1.000	0.942	0.887	0.918	0.850	Very Good
1.000	0.179	0.733	1.000	0.846	0.776	0.902	0.703	Good
0.000	0.000	0.000	0.000	0.000	0.000	0.128	0.027	Excellent
0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.019	Outstanding
0.000	0.000	0.000	0.000	0.000	0.000	0.795	0.251	Average

Table 7: SMO Classifier: Accuracy is 77.00%

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
0.980	0.314	0.750	0.980	0.850	0.693	0.830	0.740	Very Good
0.667	0.104	0.759	0.667	0.710	0.583	0.784	0.617	Good
0.250	0.000	1.000	0.250	0.400	0.492	0.839	0.346	Excellent
0.000	0.000	0.000	0.000	0.000	0.000	0.332	0.020	Outstanding
0.500	0.000	1.000	0.500	0.667	0.684	0.983	0.883	Average

Table 8: over all Accuracy

Classifiers	Accuracy(%)
Bayes Network	98.00
Naive Bayes	89.00
Logistic	81.00
AdaBoostM1	82.00
SMO	77.00

5. Conclusion

In this paper we have used five computing methods as Bayesian, Nave Bayes, Logistics, SMA and Ada boost for categorization of BS. We have taken 100 instances of 17 cognitive as well as business parameters for the categorization of BS into five i.e. Outstanding, excellent, very good ,good and average. Highest accuracy 98% and lowest accuracy 77% have been obtained from Bayes network and SMO respectively. Other the accuracy of all other methodsis obtained in between them.

6. Reference:

[1]. Shoham, Y. (1993). Agent Oriented Programming, Artificial; Intelligence, 60 (1) pp. 51-92.

[2]. Carter, J., Bitting, E. &Ghorbani, A. (2002). Reputation Formalization for an Information- Sharing Multi-Agent System. Computational Intelligence18(2): pp. 515- 534.

[3]. Gleizes et al., M. "Self-Organization and Learning in Multi-AgentBased Brokerage Services," Intelligence in Services & Networks, H. Zuidweg et al. ed., pp. 41-54, 1999.

[4]. Leea, J H Parkb S C,(2005) Intelligent profitable customers segmentation systembased on business intelligence tools, Expert Systems with Applications 29 ; 145–152.

[5]. Mazumdar, B. D. Mishra, R.B. (2009) Multiagent Paradigm for the Agent Selection and Negotiation in a B2C Process International Journal of Intelligent Information Technologies, 5(1), 61-82.

[6]. .Mazumdar, B. D. Mishra, R.B. Cognitive Parameter Based Multiagent System for Negotiation in e-Commerce, International Journal of Intelligent Information Processing Jan to June 2009issue of the journal.

[7]. Naïve Bayes: Reference:http://personal.disco.unimib.it/Vanneschi/McGrawHill_-_Machine_Learning_-Tom_Mitchell.pdf

[8]. SMO: https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/tr-98-14.pdf

[9]. Adaboost.M1: http://www.cis.upenn.edu/~mkearns/teaching/COLT/boostingexperiments.pdf]

[10]. Bayesian Network: http://personal.disco.unimib.it/Vanneschi/McGrawHill_-_Machine_Learning_-_Tom_Mitchell.pdf

[11]. Logistics http://www.sciencedirect.com/science/article/pii/S1532046404000772.