Career Guidance Chatbot

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ABSTRACT- Thepurpose ofcareer guidance botistoconductacounselingconversationbetweena humanandmachine.Thisprojectplanstorevolutionizetheworldfromtraditionalcareer counseling to digitalcareer counseling.The bothelps theusers/studentswhowilloptforSSC,HSCandUndergraduatetoselect their field of interest that would be best for them in ordertobuilduptheirfuture.Thesystemusespersonalityassessments,helpsuser/studentstoevaluatetheircareerpreferences.Thesystemenablestheuserto explorevariousexistingcareeroptionsand their scope. It also enables the user to get a detailed reportaboutthesuitablecareersinorderofpreferences thatstudenthaveselected.Thestudent/usercanalsoaskaboutthe generalqueriessuch asinformation abouta stream,sub-stream andvariouscourses.Thechatbotwillalsoprovidethe recenttrendsintheeducationsector.Theaveragesalaryofthesuggestedcourseswillalsobe displayedaftertheassessmenttest. The detailedresultandstatisticsafterthepersonalityassessmenttesthelpsauser/studenttomakewiseandfruitfuldecisions.

I. INTRODUCTION

Chatbots are not a new turn of events. They are recreationsthatcancomprehend humanlanguage, measureit, and collab-orate back with people while performing explicit assignments.For instance, a chatbot can be utilized as a helpdesk leader. Thefirst chatbot was made by Joseph Weizenbaum in 1966, namedEliza.Everything beganwhenAlan Turing distributedanarticlenamed"PCHardwareandKnowledge", andbroughtupa captivating issue, "Can machine think?", and from that pointforward,we have seen differentchatbots outperforming withoverwhelming smart performance to be all the more normallyacquaintedand mechanically progressed.Nowadays,humanassociationwithcomputerizedgadgets hasbecomenormalwhich prompted the improvement of a chatbot. Chatbots assistpeople to speak with PCs.AI gives frameworks the capacitytoconsequently takeinand improveasamatteroffactwithout being expressly customized. Because of modernizationin record keeping, immense information bases and informationage happenswhichcould assista botwith improving itsproductivity and precision.Bots, we are very well acquaintedwith this term nowadays.CareerBotis yourpersonalcareercounseling bot.Be ita studentora parentallyourqueriesare just a click away.The Bot is as interactive as human andinfactmoreintelligentthanhuman.CareerBotaims toprovidea end to end virtual counseling environment with effective andaccurate outcomes where the student/user can get guidance fortheir future.

II. LITERATURE SURVEY
[1]   TheRoleofChatbotsinFormalEducation
Chatbotsappearedinlargenumbersatthebeginningofthe current decade. Interactive technology, often combined withartificialintelligence,hasrapidlyinvadedandoccupiedtheworldof online chat. Chatbots are not just elements of virtual assistants,but are used by organizations and governments on websites, inapplications,andinstantmessagingplatformstopromoteproducts,ideasorservices.Inthispaper,theauthorsfirstlypresenta theoretical and historical background, then discuss the issues ofusingchatbotsaseducationalassistants,andfinallydescribethebasicstepsandchallengesofprogramminga bot.
[2]   Adoptionof AI-Chatbots to Enhance StudentLearningExperiencein HigherEducation inIndia

IntheeraofAI,theChatbotmarketiswitnessin gextraordinary growth with the increased demand for smartphonesand increased use of messaging applications. In the past few years,the food delivery business, finance and the E-commerce industryhave embraced Chatbot technology. One of the industries whichcan really benefit from using this technology is the educationalsector. Education can benefit from Chatbot development. It canimprove productivity, communication, learning, efficient teachingassistance,andminimizeambiguityfrominter action.Aneweducationplatformcansolvenext-levelproblemsineducationusingthistechnologyasthe engagementtool.Theaimofthisresearch paper is to find out the factors which affect the adoptionof Chatbot technology in order to enhance the student learningexperience in the Indian higher education sector. In this research, aQuantitative method is used through data collection from surveysofsomeoftheprominenthighereducationinstit utesusingChatbottechnologyinIndia.Itisexpectedtha ttheresearchoutcomewillhelpChatbotdevelopersand highereducationproviders to better understand the requirements of students whileproviding an interactive learning and communication platform forthem.

[3] AnAndroidbasedMobileApplicationfor CareerGuidance

Theapplication canbeusedbystudentsandparentsasitprovides all details of colleges like tuition andaccommodationfees,eligibilitycriteria,campuspl acementopportunities,accommodationfacilities,sch olarshipschemes,campussupportservices,rulesandre gulations etc. It helps students to select colleges in engineering andmanagement field in India and abroad based on the factors like qualifyingexamdetails,technicalexpertiseandotherd etails.Theapplicationprepares the college list as per the entrance examination marks and theeligibility criteria of colleges andthe courses chosen. The college list isfilteredbasedonparameterslikeinstitutionranking,f eelimitsandlocationchosen Aptitude Test (AT).The Aptitude Test is multiplechoice question (MCQ) based and includes verbal section, quantitativesection and general knowledge. The application will help the students togetthemostappropriatecollegeandthecourseinthefi eldoftheirinterestinIndia orabroad.

[4] ChatbotforCareerGuidanceusingAI

SystemisdevelopedusingArtificialIntellige nce.Itcontainstwodivision;inthefirstdivisionastudent willbeanalyzedforhis/herinterestandinthesecondddivi sionheavailablecourses,jobaspectsrelatedtotheirabil itywillbesuggested. To analyze a student, marks in various subject in SSCand vocational interest in different fields have been consideredandfuzzysetshavebeenformed.Somekno wledgehasbeenembedded into the machine so that it identifies the sentences andmaking a decision itself as response to answer a question. Theresponseprincipleistoextractthetokensfromthese ntenceprocess on that find the goal of sentence by matching the inputsentence from user.The system uses aptitude and achievementassessments,tohelpclients evaluate theirinterests,skills,andabilities.

[5] Techie.ai

Techie.aiissuchaChatbotthataimstoprovide guidance to the job seekers. It has its basis in AI to providemechanismstoperformasearchforresponsest otheuserqueries. It provides some valid result to the user by analyzinguser query and understanding user's message. The user can putforthanycareerrelatedquerythroughTechie.ai'sus erinterface that is built for interacting withthe bot. The userqueries are analyzed and then answered as if it is given by thecareercounsellor.Thissystemguidestheusertomak etherightcareerchoicebygivingopinionsbasedontheir skillset.Techie.ai helps the user to choose the right career that best fitstheirinterestsandcapabilities.

III. PROPOSED SYSTEM

Theproposed systemaimsto addresstheproblem oftraditionalcounseling and bringing a end to end solution bycreating the virtualcounseling environmentthrough Chatbot.We have created a Career Guidance Chatbot called CareerBotthatwillhelp the students to take better decisions regardingtheir career It will also help the students to get the informationaboutvariousfieldsandcareerchoices.We haveusedartificialintelligence (AI) which will trainthebottoprovidebestadvicestothestudentsregard ing theircareeroptions basedon factorssuch astestperformanceand areaofinterest.We have usedNaturalLanguage Processing (NLP) for betterunderstanding oftheuserquestionsby thechatbot basedon theusersquestion themostappropriateanswer from theknowledge base willbe served as an answer.The developedsystem gives the top 5 suggestions for career choices alongwiththe shortsummary ofeach domain.In addition tothe piechart analysis the system also provides current trends in eachfieldalongwiththeaverageannualsalary.

IV. METHODOLOGY

Algorithmsprovetobethefoundation forimplementingthesystemfunctionalities.Thepropo sedsystemisaChatbotimplementation ofa botnamed CareerBot.Forany bot tobeeffectiveandoptimalitisnecessary tounderstandthehumanquery.TheChatbotcan understandthehuman statementsthrough TextClassification.In oursystem we haveimplemented MultinomialNaive BayesAlgorithm fordoingso.ThisChatbotisdevelopedin PythonLanguagealongwith the Stream LitFramework of Python.Ituses TensorFlowframework anditistrained by linking thedatasetswith database forfasteroperations.The Chatbotalso uses KerasFramework for training purposes. Wordnet lemmatizer is usedtoconsiderthecontextandconvert theword tothemeaningfulbase form.LabelEncoder from SciKitLearn library is usedto convert thetext orcategorize datainto numericaldatawhich the model expects and performs better with. In order toimplement NLP tokenization is done using thee NLTK moduleof python. Adapters like input, output, storage, logical etc. areused for analyzing the users input and giving relevant answersby scanning the mostappropriate match of the users inputfrom thedatabase.

A. MultinomialNaiveBayesAlgorithm

Naive Bayes is the clearest and quick classification calculation, which is reasonable for an enormous lump of information.Whenever classification is performed the first step is to under-stand the problem and identify its label and features. Featuresare those attributes that have a great effect on the results of thelabel. The classification consists of two-phase first is a learningphase and the otheris the evaluation phase.In the learningphaseclassifierisusedtotrainitsmodelon the basis of thegiven dataset and in the evaluation phase,the performance ofthe classifier is tested.Performance is calculated on the basisof variousfactorssuch as error, precision,recall, and accuracy.
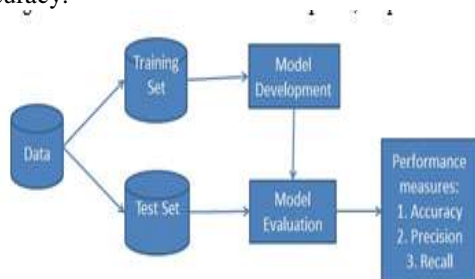

Fig.1.ClassificationWorkflowof Multinomial

NaiveBayes

Naive Bayes is a classification technique that is based on theBayestheorem.NaiveBayesclassifierisoneofthefa st, ac-curate, and reliable algorithms. The naive Bayes classificationalgorithm has great accuracy and high speed on a large dataset.The naive Bayes algorithm assumes that the effect of an individual feature present in the class is independent of the otherfeatures.The Multinomial Naive Bayes Algorithm also holdsthe capability to calculate probability across multiple features.Allthe feature are computed through probabilistic approachwhere the tag values are computed for each textual appearance.MultinomialNaiveBayesAlgorithmbelo ngstothecategoryof probabilistic algorithm where the bayes theorem is appliedwith the "naive" assumption.On the naive assumption madethereisaconditionalindependence associated betweeneachpair thatexistfor a feature.In Bayes theorem probability iscalculatedasP(c—x)wherecdenotestheexistenceofclassfor thepossibleoutcomesand x represents the instancethat hasbeenrepresentingafeatureandhasbeenclassified. P(c—x) = P(x—c) * P(c) / P(x) is the formula used for theprobabilistic calculation. Multinomial Naive Bayes Algorithmproves to be the ideal for text classification as it has the probabilistic capability to predict the tag of the text. The algorithmcalculates the probability value for each given tag. Later aftercomputing allthetag values thetext is classified in the taggiving the highest probability value. The tag values calculatedalways ranges from 0 to 1 as it is a probabilistic approach forcomputations.MultinomialNaive Bayes Algorithm are mostprominent and comprehensive for text classification thus it ismostoftenused by thechatbot systems.

B. SystemImplementation

Thereare two main interaction modulesfor User/Studentfirst one is the general query and the second one is personalitytest.User/Student has the functionality to ask a query to theChatbot. The Query asked by the User/Student is first Lemmatized and tokenized to identify the true sense of question beingasked. The analyzed statements on which text classification isperformed is further matched with the most relevant answer inthe knowledge base. In this system text classification is appliedthrough Multinomial Naive Bayes Algorithm. After an answerisgenerated, it isreturned tothe User/Student.The secondpart of the counseling is assessment test where the user has

toselectthe desired stream for the questionnaire.Based on theselection there is a quiz of 15 questions which evaluates theirarea of interest. There is a logic adaptor that actually analyzesthe quizresultsbased on theselection rightfrom stronglyagree to strongly disagree. Based on the logic adaptor's resultthe CareerBotsuggeststhetop5 mostpreferred field theyshould opt for.Once the fields are suggested the bot displaysthe additionalinformation such as field summary,trend overyears,averageannualsalaryandexperts contactdetails foreach suggested field.Apartfrom this the CareerBotis alsocapable to give answers to personalized questions asked byUser/Students.
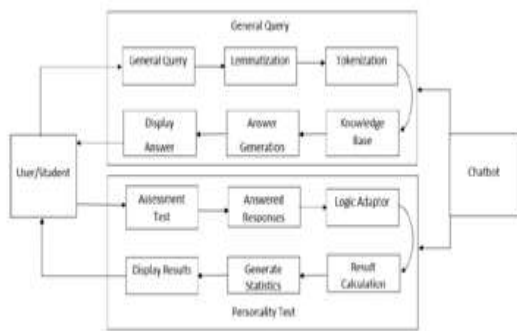
Fig.2. Architecturalmodelofthesystem

Implementationinvolvesthe following main steps:
1) User/Studentasking aquery toChatbot.
2) Chatbotanswerstothequery askedby the User/Student.
3) User/Studentagreesfor givingthe PersonalityTest.
4) User/Student selects the stream i.e.,SSC,HSC or Undergraduate.
5) User/Studentattemptsthepersonality testdisplayedbythe CareerBot.
6) Chatbotgenerates theresultby suggesting top 5mostrelated fields.
7) Chatbot gives a shortsummary aboutallthe suggestedstreams.
8) Chatbotdisplaysthetoptrendsforeachsuggestedfield.
9) Chatbot displays the approximate annual salary for eachstream.
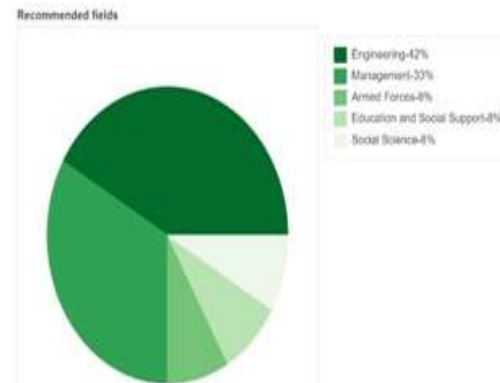10) Chatbotshowsthe contactdetailsforexpertsintherespective field.
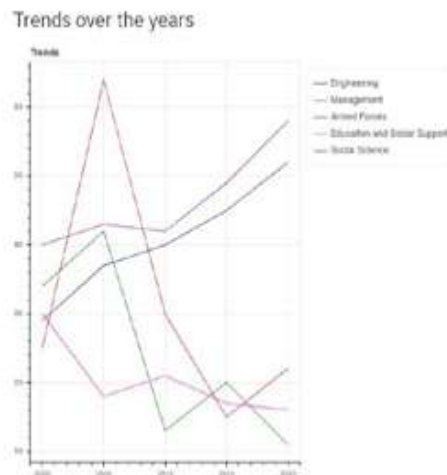

Fig.3.CareerBotHomePage

Fig.4.Top5CareerChoices

Fig.5.Trendsovertheyears

V.   CONCLUSION

Careerselection isone of the mostcrucialdecisions inanindividual'slife.Choosing awrong careercanleaveanegativeimpacton ourlife.To overcomesuch problems"Career Guidance Chatbot Using AI" is the need of hour in thistechnology driven era. Due to chatbot's well assessed answersandimpactful suggestions it would help individual to makeacorrectand fruitfuldecision for their career.Personality teststatistics and smart answers from chatbot will strongly help auser/studentto analyzetheir interestsand thusdecide wisely.The Chatbot also shows the recent trends for choosing a career.There are lots of details that the chatbot is capable to providesuch as streams,sub-streams, courses and the average salarypackages.The projectcould increase its scope by providingvarious other details such as diploma and specialized courses.Due to the boom of internet and increasing trust of ArtificialIntelligence Chatbot the CareerBot will definitely excel basedon its smartanswers and impactfulresultand statistics.Thisproject plans to revolutionize the world from traditional careercounseling todigital careercounseling.

VI.   ACKNOWLEDGMENT

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