Employee Attrition Prediction using Machine Learning

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Abstract: *This project uses the random forest algorithm to forecast whether or not a company's employee will leave. We use, among other things, the number of years an employee has worked for the company as well as the appraisal of employee performance on a monthly basis. Logistic regression, decision trees, and artificial neural networks (ANNs) are further methods for solving this issue. The dataset was divided, with 70% of it being used to train the algorithm and 30% of it being used to test it, yielding an accuracy of 89.73%. People analytics help organisations and their human resources (HR) personnel reduce attrition by modifying the tactics for attracting and retaining talent in the era of data science and big data analytics. Employee attrition poses a serious issue and a significant risk to firms in this situation since it has an impact on both productivity and the continuity of planning. The important contributions this study brought to the field are listed below. We first suggest an approach for people analytics that changes from a big data context to a deep data context by focusing on data quality rather than data quantity in order to anticipate employee attrition.*

Keywords: Deep people analytics, employee attrition, retention, prediction, interpretation, policies recommendation

REFERENCES

[1]. G. King and L. Zeng, ''Logistic regression in rare events data,'' PoliticalAnal., vol. 9, no.2, pp. 137–163,2001.

[2]. G.E.Hinton,''Reducingthedimensionalityofdatawithneuralnetworks,''Science, vol. 313, no. 5786, pp. 504–507, Jul. 2006.

[3]. A.LiawandM.Wiener,''ClassificationandregressionbyrandomForest,''RNews,vol.2,pp.18–22,Dec.2002.

[4]. J.H.Friedman,''Greedyfunctionapproximation:A gradientboostingmachine., ''Ann.Statist.,vol.29,no. 5,pp.1189–1232,Oct. 2001.

[5]. J.V.Beaverstock,B.Derudder,J.R.Faulconbridge,andF.Witlox,''Inter-national business travel: Some explorations,'' GeografiskaAnnaler, B,Hum. Geogr., vol. 91, no. 3, pp. 193–202, Sep. 2009.

[6]. P. Runeson and M. Höst, ''Guidelines for conducting and reporting casestudy research in software engineering,'' Empirical Softw. Eng., vol. 14,no.2,pp.131–164,Apr.2009.

[7]. B.K.GoswamiandS.Jha,''Attritionissuesandretentionchal-lengesofemployees,''Int.J.Sci.Eng.Res .,vol.3,no.4,pp. 1–6,Apr.2012.

[8]. G. Brown, ''Ensemble learning,'' in Encyclopedia of Machine Learning,vol. 312. 2010, pp. 15–19.

[9]. F.Pedregosa,G.Varoquaux,A.Gramfort,V.Michel,B.Thirion,O.Grisel,

[10]. M. Blondel, P. Prettenhofer, R. Weiss, V. Dubourg, and J. Van der Plas,''Scikit-learn:MachinelearninginPython,''J.Mach.Learn.Res.,vol.12,pp. 2825–2830, Oct. 2011.

[11]. S. V. Kalinin, B. G. Sumpter, and R. K. Archibald, ''Big-deep-smart datain imaging for guiding materials design,'' Nature Mater., vol. 14, no. 10,pp. 973–980,Oct. 2015.

[12]. N.Shah,Z.Irani,andA.M.Sharif,''BigdatainanHRcon-text:Exploringorganizationalchangereadiness,employeeattitudesandbehaviors,''J.Bus.Res.,vol.70,pp. 366–378,Jan.2017.

[13]. A Tursunbayeva, S. D. Lauro, and C. Pagliari, ''People analytics—Ascopingreviewo fconceptualboundariesandvaluepropositions,''Int.J. Inf. Manage., vol.43, pp. 224–247, Dec.2018.

[14]. S. Shah, S. Alatekar, Y. Bhangare, B. Kasar, and R. Patil, ''Analysis ofemployee attrition and implementing a decision support system providingpersonalizedfeedbackandobservations,''J.Crit.Rev.,vol.7,no.19,pp. 2372–2380, 2020.

[15]. F.Fallucchi,M.Coladangelo,R.Giuliano,andE.W.DeLuca,''Predictingemployeeattritionusingmachinelearningt echniques,''Computers,vol.9,no. 4,p. 86,Nov.2020

[16]. S.Kakad,R.Kadam,P.Deshpande,S.Karde,andR.Lalwani,''Employeeattritionpredictionsystem,''Int.J.Innov.Sc i.,Eng.Technol.,vol.7,no.9,p. 7, 2020.

[17]. S. R. Ponnuru, ''Employee attrition prediction using logistic regression,'' Int.J.Res.Appl.Sci.Eng. Technol.,vol.8,no.5,pp. 2871–2875,May 2020

[18]. N. Jain, A. Tomar, and P. K. Jana, ''A novel scheme for employee churnproblemusingmulti-attributedecisionmakingapproachandmachinelearning,'' J. Intell. Inf. Syst., vol. 56, no. 2, pp. 279–302, Apr. 2021