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Paper Title: - Resource forecast of technical support during version upgrade for a dynamic cloud software organization using R

Abstract

In this paper we are trying to predict the number of human resources (i.e. technical support people) needed after software version upgrade in cloud service organization.

This paper focus on the study of “How an organization is overcoming resource crunch to provide a seamless quality service to its customers without affecting other organizational functions/process also at the same time it is cop-up with the increasing inflow.

Here in this paper, we tried to study the current inflow of work with existing resource, their average response (output) per day with quality guideline against increasing workload. So we tried to analyse optimum productivity per day against increasing workload with current and historical data of previous version upgrade (i.e. of same software services) and number of resource at present and in past against more 80% new functionalities added to upgrade version. Also till what duration each LOB (line of business) has bandwidth (i.e. till what time operation can continue with optimum utilization of existing resource).

The outcome of forecasting will tell what workflow is going to come per day in each LOB across all location and how many resource would be sufficient to cater the need with back-up(i.e. attrition and absenteeism).Also this paper suggest the organization in hiring process(i.e. what no. should be hired per week) and what would be the TAT(turnaround time) of technical support which include training, budding, so they start yielding desired productivity.

Keywords

Technical Support, Account, Bug, open-ERP, after hours, Version -Upgrade.

Methodology

(a)Data (current and historical) to be extracted for database of below items

- Current count of technical employees

- Current help from other LOB
- Current inflow
- Current Outflow
- Existing workload(quantified)
- Workload increase per day (quantified)
- Tenurity and experience wise technical staff
- Current existing client count
- Weekly addition of new clients
- Weekly addition of workload of existing clients

(b)Tools/systems/software's to be used paper:

- R /R Studio/Revelation R
- MySQL/MS SQL – for data dump
- Excel/Open office– for data transformation

(c)Broadly R packages to be used in this paper:-

- Basic packages for loading R
- Rattle-Graphical user interface for data mining in R
- Expsmooth-Data sets from "Forecasting with exponential smoothing"
- FitAR-Subset AR Model Fitting
- FitARMA-FitARMA: Fit ARMA
- Fracdiff-Fractionally differenced ARIMA aka ARFIMA(p,d,q) models
- Gsarima-Two functions for Generalized SARIMA time series simulation
- Arfima-Fractional ARIMA Time Series Modeling
- Editrules-R package for parsing, applying, and manipulating data cleaning rules
- Dataview-Human readable data presentation
- Tm-Text Mining Package
- glmnet-Lasso and elastic-net regularized generalized linear models – For fitting generalized
- arulesSequences-Mining frequent sequences
- arulesViz-Visualizing Association Rules and Frequent Itemsets
- ACD-Categorical data analysis with complete or missing responses
- ora-Convenient Tools for Working with Oracle Databases
- FAiR-Factor Analysis in R
- Tsfa-Time Series Factor Analysis
- rJava-Low-level R to Java interface
- rJavax-rJava extensions
- RJDBC-Provides access to databases through the JDBC interface

- RMySQL-R interface to the MySQL database
- RODBC-ODBC Database Access
- sqlliter-Connection wrapper to SQLite databases
- sqlshare-API for access to SQLShare database
- sqldf-Perform SQL Selects on R Data Frames
- caroline-A Collection of Database, Data Structure, Visualization, and Utility Functions for R
- lubridate-Make dealing with dates a little easier
- FKF-Fast Kalman Filter

(d)Techniques

Descriptive analysis, Time-Series (ARIMA,ARFIMA, SARIMA), Regression.

(e)Type/source of Data:-Primary/Cognos/Slave Database/ open ERP.

Findings and results

Resource and workload prediction with accuracy of 95% along with error forecasting on daily and weekly basis.

Key Findings: - In full paper

Result: - In full paper

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