Chapter 9

Forecasting the Space Utilization Trend in Corporate Offices

Apurva Patil
Liverpool John Moores University, UK

Rajesh Kumar K. V.
https://orcid.org/0000-0002-7989-1824
Woxsen University, India

ABSTRACT

The research is mainly focused on forecasting office space utilization trends in the organization using information such as office space count, space occupancy count, holidays, leaves. Space occupancy data is collected using PIR sensors. Descriptive analytics is done using creative visualizations, and model building is done using univariate and multivariate time series methods. Descriptive analytics explains that there is a positive autocorrelation in the data with no outliers and randomness. There exists a pattern of space occupancy for different office locations at different times of the day. Univariate time series models are suitable for forecasting space occupancy for single office locations, whereas multivariate time series model VAR is suitable when considering multiple office locations of a client or multiple office locations of different clients at the same time. Empirical research has exhibited that out of tested models, SARIMAX has shown better performance on multiple test datasets.

INTRODUCTION

In today's era, companies are focusing more on the utilization of their real estate by wisely managing financials and operations. They are also leveraging space utilization metrics. Organizations require different types of assets to function profitably. Employee workspace defines the required privacy to the employee, and security of their belongings. Failure of the organization to provide enough area, architectural accessibility, social space to the employees will create a negative impact on the work environment.

Space is the biggest asset of the organization. Space Utilization will change with conditions of demand and trend. Space management is an ongoing process for an employee workspace; though its capacity remains the same, with efficient space management its occupancy can be varied (Reagan Nickl (SpacelQ), 2019). For any office, examination of how much workspace is utilized will give the ideal ratio of occupancy. For proper utilization of office workspace, we need to take into consideration total number of desk spaces, employee count, occupancy pattern and architectural view using which office workspace can be utilized properly. If employee count increases, it would be easier to rearrange office space arrangement to accumulate more number employees while managing basic requirements of employee space and safety. It is common for companies to invest in real estate as they grow, but the questions that come up are how efficiently office space can be utilized and what if any unpredicted critical situation comes and these owned or leased office spaces will become a financial burden for these companies.

Companies realized space as their major liability at the time of financial crisis happened in the US in the year 2008, where the financial, investment firms, banks, etc were broken and the only way for the IT industry left was to save them money by reducing the amount they are paying for the lease. So the main focus at that time was only limited to the IT/ITES industry (Material, 2016).

Prior to the financial crisis in the year 2008, organizations used to consider their huge office spaces as their asset, but later on office spaces became liability to the organization. Considering the current situation of the COVID-19 pandemic, many companies are focusing on reducing cost concerning office space that is under-utilized or not utilized. It would also help them to reduce real estate cost and increase profitability. This would allow organizations to focus on managing the safety of the employees who are returning to the office by using facility management. Companies also need to ensure space management with optimal investment in real estate and its utilization.

Space utilization trends for an organization can be arrived at on the basis of past data of office space occupancy. Space utilization trends will help organization to adopt Activity Based Working (ABW) approach in continuously evolving business

Related Content

Using CNN for Brain Tumor Diagnosis: An Overview
Shravani Kulkarni, Piyush Amol Bhosaleand Susanta Das (2024). *Future of AI in Biomedicine and Biotechnology (pp. 104-124).*
www.irma-international.org/chapter/using-cnn-for-brain-tumor-diagnosis/348512

Model-Based Analysis and Engineering of Automotive Architectures with EAST-ADL: Revisited
Ramin Tavakoli Kolagari, DeJiu Chen, Agnes Lanusse, Renato Librino, Henrik Lönn, Nidhal Mahmud, Chokri Mraidha, Mark-Oliver Reiser, Sandra Torchiaro, Sara Tucci-Piergiovanni, Tobias Wägemannand Nataliya Yakymets (2015). *International Journal of Conceptual Structures and Smart Applications (pp. 25-70).*
www.irma-international.org/article/model-based-analysis-and-engineering-of-automotive-architectures-with-east-adl/152377

A Fuzzy Clustering Model for Fuzzy Data with Outliers
M. H. Fazel Zarandiand Zahra S. Razaee (2013). *Contemporary Theory and Pragmatic Approaches in Fuzzy Computing Utilization (pp. 29-40).*
www.irma-international.org/chapter/fuzzy-clustering-model-fuzzy-data/67480

Facial Expression Recognition for HCI Applications
Fadi Dornaikaand Bogdan Raducanu (2009). *Encyclopedia of Artificial Intelligence (pp. 625-631).*
www.irma-international.org/chapter/facial-expression-recognition-hci-applications/10312

Groupwise Non-Rigid Image Alignment Using Few Parameters: Registration of Facial and Medical Images
Ahmad Hashim Aal-Yhia, Bernard Tiddeman, Paul Malcolmand Reyer Zwiggelaar (2019). *Handbook of Research on Human-Computer Interfaces and New Modes of Interactivity (pp. 361-384).*
www.irma-international.org/chapter/groupwise-non-rigid-image-alignment-using-few-parameters/228536