Abstract

Workforce planning is how an organisation analyses its workforce and determines the actions that must be taken to prepare for future staffing requirements. Workforce planning is future-focused, helps human resources offices make good hiring decisions, increase employees' productivity, increase profit for an organisation, and identifies and saves any extra costs. If not done correctly, workforce planning can result in bad hiring decisions, high employee turnover, low productivity, and surplus cost to the company. Our research uses the Markov chain model to forecast probability distributions for different cohorts in the given organisation. We then use these probability distributions to find the corresponding employee headcounts. Markov chain is a stochastic random process based on the transitions between states based on transition probabilities. The dataset used in our analysis is a human resource dataset consisting of employee records in an organisation. The dataset fields are generic, so the proposed solution applies to the majority of the human resource datasets belonging to various organisations. Our analysis considers only the outflows but is flexible enough to incorporate the inflows. The results reflect the workforce distribution in an organisation for the next ten years, starting from 2018, based on department, age groups and gender. We found that the rate of resignation and layoffs are increasing in all the cases and hence require attention to draft relevant policies that address current shortcomings. The research output of this study could help HR departments form their respective organisations' hiring, training, retention and retirement policies.

Keywords: Workforce Planning, Markov Chain, Shift Probability, Transition Probability Matrix, Transition Probability