labor_planner: A Python package for planning and visualizing staff labor allocation

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Summary

Labor planning, a.k.a. workforce planning, has an established importance in larger organizations due to the benefits of being prepared and aware of staff allocation gaps that may limit productivity (Louch 2014; De Bruecker et al. 2015; Schweyer 2010; Pynes 2004). Additionally, the organizational benefits of providing staff with a healthy work-life balance are widely published (Virtanen et al. 2011, 2009; Sparks et al. 1997). Labor planning is now one of the most difficult problems managers have to address (De Bruecker et al. 2015). Pynes (2004) states that for workforce planning to succeed, human resources personnel and managers must become strategic partners to develop new skills and competencies. In this paper, we present one such development to ameliorate the burden of labor planning on managers and human resources personnel alike to provide organizational workforce stability.

We developed the `labor_planner` Python package to provide insight into whether staff are currently over- or under-committed and who, and which projects, are the key consumers of staff chargeable hours. Our package also evaluates and visualizes projected labor allocation throughout a calendar year to ensure staff have time to complete existing project work and to assist staff who may not be projected to meet billable requirements. The `labor_planner` information for each staff member are provided by project managers who distribute work among their employees. We find that project managers often do not communicate with one another about staff time commitments when they create workforce plans for a fiscal year. `labor_planner` was created to elucidate this unintended miscommunication which is a common cause of limited productivity and resulting poor work-life balance among staff.

`labor_planner` was created to be used by project managers, human resource personnel, administrators, or staff that wish to evaluate current and future labor allocation to increase the efficacy of their projects. This package produces outputs in spreadsheet form that are easily navigable and informative. Outputs include staff-level individual summaries detailing project commitment monthly,

project-level summaries highlighting the number of staff and hours per project within an organization, a staff overview summary containing funding probability considerations and visualization, all staff rundown of monthly commitments tied to visual indicators for over- and under-commitment, and overall summary charts and data for all staff and all project and their interrelation. `labor_planner` was designed for extension and reuse and the authors encourage continued community development.

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