This project is in collaboration with BAM Energy Systems

Assessment of the effect of indoor climate quality on occupant productivity for in-use buildings

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Introduction

For most employers, the health and wellbeing of their staff is seen as an essential component of a productive and successful organization. Staff costs, including salaries and benefits, typically account for about 90% of the business' operating costs. As a result, modest improvements in employee health or productivity can have a significant financial implication for employers. (WGBC, 2014)

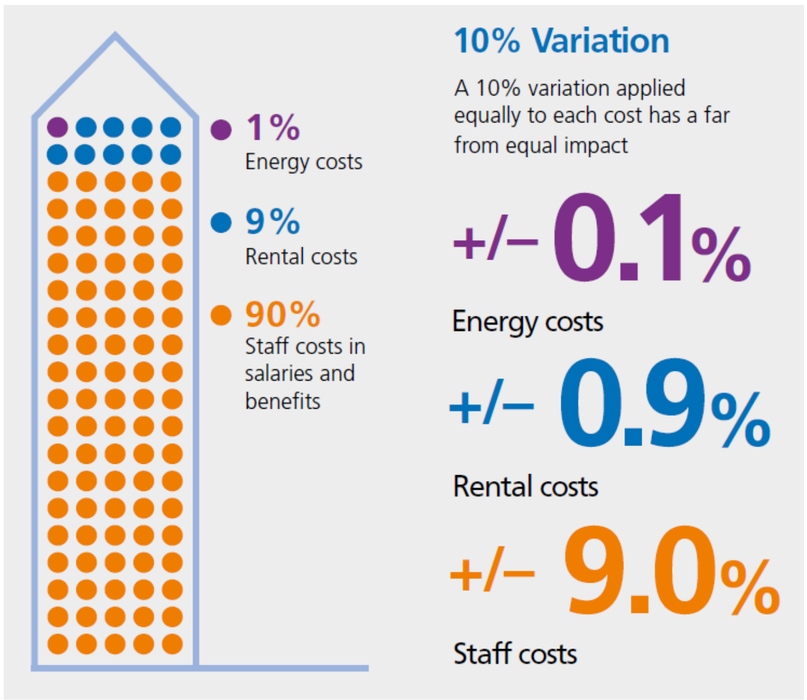


Figure 1. Typical business operating costs (WGBC, 2014)

Productivity means the ratio of output to input, including both quantity and quality of the product or service that is delivered. (Niemela et al., 2002) (Leaman&Bordass, 2000) There are several factors affecting productivity: social environment, organizational structure, indoor environment and personal characteristics. Research indicates that indoor environment has the biggest influence on productivity with respect to job dissatisfaction and job stress. (Stankevica, 2014) (Rolloos, 1997)

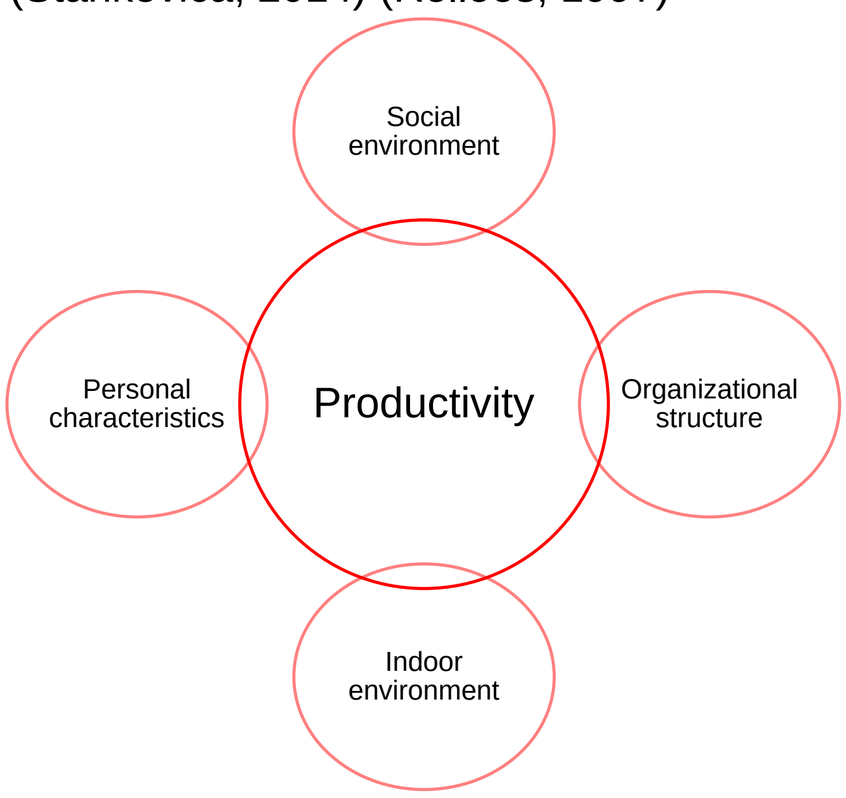


Figure 2. Factors affecting productivity of employees

Research plan

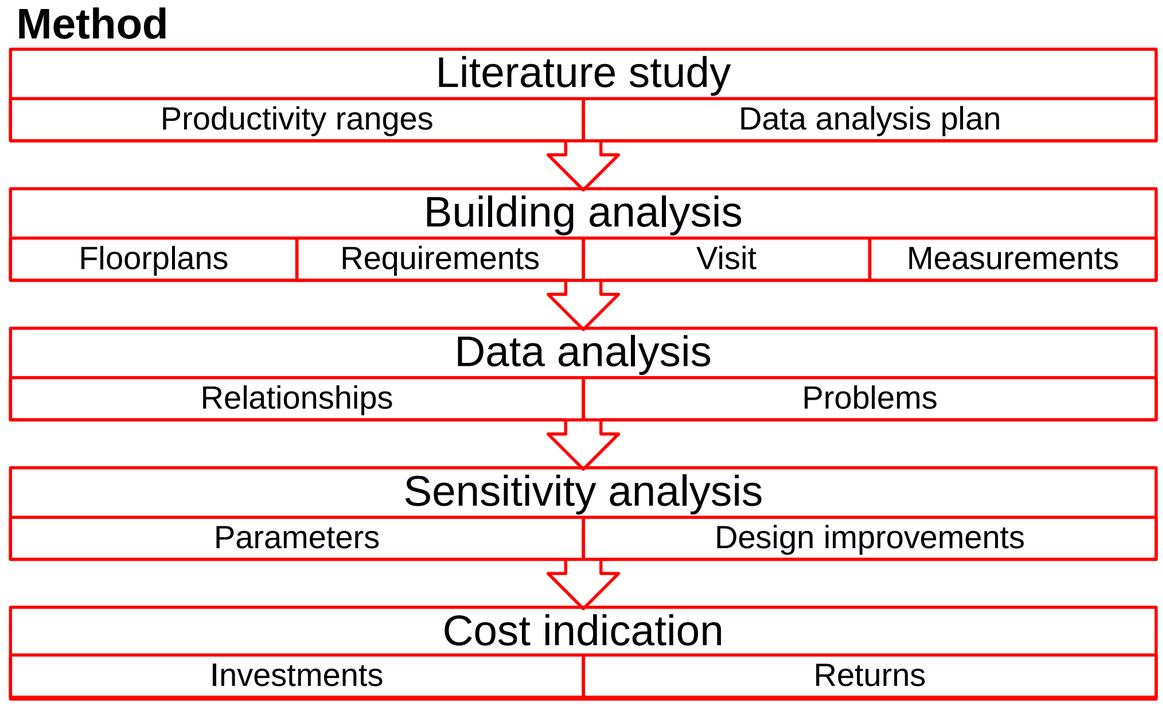
Research question

The main question in this study is: What is the performance of in-use buildings in terms of productivity and which parameters have the largest influence?

Research objectives

- To establish the range in which productivity falls as a function of thermal comfort and air quality
- To determine how a representative current in-use building performs
- To develop a method to evaluate in-use buildings on productivity
- To identify economic design and control improvements

Method



In this study, in-use office buildings will be assessed on current theoretical knowledge. With use of data from sensors the productivity of employees will be determined. Based on this analysis, design improvements will be established and the parameters that affect the productivity will be considered. Finally, cost-optimal solutions on thermal comfort and indoor air quality are determined to maximize the productivity of employees.

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