

# The Work Life of Developers: Activities, Switches and Perceived Productivity

This research was accepted for the Transactions on Software Engineering (TSE) Journal.

The journal is peer-reviewed and published monthly by IEEE Computer Society. Its main interest is in well-defined theoretical result researches and empirical studies that have potential impact on the construction, analysis, or management of software.

This research was published in January of this year and has been downloaded 125 times from the IEEE servers.

## **Problem Statement:**

Many software developers' daily work is often divided into a variety of activities such as coding, meetings and unplanned interruptions from coworkers. There is a need for understanding how developers' work can be quantified to optimize productivity. Unfortunately, most of the companies attempts into improving developers' productivity are done without fully understanding how these workers spend their day at work. This research strives to identify a developer's practices during work hours and its relationship with their own perception of productivity.

## **Paper Synopsis:**

The main purpose of this research paper is to study the developer's behavior during work and the relationship to their perception of productivity.

The researchers monitored 20 developers from 4 different companies. To do so, they created an application in charge of logging a wide range of digital activities from a developer's computer. The application registered an event for each mouse (click/movement/scroll) and keyboard (keystroke) action. Also, every 10 seconds the current activity process and window title was recorded, or an "idle" entry if there was inactivity for more than 10 seconds.

To analyze how developers perceived their own productivity, the researchers used experience sampling in the form of self-reports that appeared every hour in the developer's computer.

## *Research Questions:*

1. What does a developer's work day look like in terms of activities and switches?
2. Are there observable trends in how developers perceive their productivity?
3. What is the relationship between developers' activity and perceived productivity at work?

The monitoring application collected data from 2,197 hours of developer's computer use during 220 work days.

The results of this paper demonstrated that productivity is a personal matter, what works as productive for one developer can be unproductive for another. The researchers also found that a developer's work is fragmented and frequently interrupted by external factors.

Other remarkable results:

- Developers spend very short amount of time in one single task (0.3 to 2 minutes) before switching to another.
- Developers have an average of 2.5 short breaks (10.5 minutes) of unplanned time away from the computer during every work hour.
- Developers' observed productivity follows habitual patterns classified as morning / afternoon / low-at-lunch people.

**Future Work:**

*Improve the identification of "idle" records.*

Many of the logs were categorized as "idle" if the user was out for more than 10 seconds. It was difficult to map the activities the participants did during this period of time and this could affect some of the analysis results.