use publicly available data, demonstrating "open research" (van der Aalst et al., 2016). We contacted all authors of the remaining papers twice, but did not receive software or data to use for comparative evaluation.

We use the same datasets as Breuker et al. (2016). The BPI Challenge 2012 dataset (van Dongen, 2012) is a real dataset from a loan application process in a Dutch financial institute with 13087 traces. It can be separated into three sub-processes concerning the application itself (A), the offer (O) and the work item (W) belonging to the application. The BPI Challenge 2013 datasets (van Dongen, 2013a,b) are real datasets from IT incident and problem management processes at Volvo Belgium with 7553 and 2300 traces, respectively.

In addition to separating the BPI 2012 data set by sub-process as done by Breuker et al. (2016), we also use the combined dataset. While Breuker et al. (2016) use only activity completion events for the BPI 2012 dataset, we also test our approach on all events (including the lifecycle transitions "Start", "Schedule" and "Complete"). However, only the "W" subset has events other than completion events. Furthermore, we include an experimental condition where we extract the activity name and lifecycle transition, and combine this with the name of the resource associated with the event (cf. Sec. 3.5). We simply concatenate the two character strings to form the composite word. This creates a larger vocabulary which increases the prediction difficulty, but also provides more information to the training algorithm. It also allows prediction of not only the activity of the next event but also the resource associated with the next event. Because the number of distinct resources in the BPI 2013 datasets is very large, we use the organizational group instead of organizational resource. Table 2 shows characteristics of the datasets.

The published datasets are transformed using XSL transformations to extract traces, events, and resource information in a suitable format.