- Supplementary Material -
An Experimental Study of Intuitive Representations of Process Task Annotations

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1 Descriptive Statistics

1.1 Sample description

Table 1 shows descriptive statistics on the 50 study participants in the sample. Since the data was collected in presence of the investigator, we could avoid missing values on single items. We classified subjects having already created or read process models for specific purposes as having prior knowledge, regardless of the type of modeling language used. In our sample, we ended up with 26 persons with and 24 persons without experience in process model creation or execution.

Variable	Scale	Mean/Count	SD/Percentage
Age	-	35.2 (21 to 66)	11.4
Gender	male/female/diverse	24/26/0	48%/52%/0%
Highest level of education	primary/lower sec./secondary/ high school/university	1/3/10/ 9/27	2%/6%/20%/ 18%/54%
Job position	student or none/employee/ executive position/head	7/30/ 10/3	14%/60%/ 20%/6%
Working experience	-	10.8	10.3
Focus of education	engineering and IT/health/ economics and politics/media/ crafts/other	13/13/ 12/6/ 3/3	26%/26%/ 24%/12%/ 6%/6%
Instruction preference	text-based/image-based/ diagram- or list-based	7/29/ 14	14%/58%/ 28%
Prior knowledge			
Created or read process models	yes/no	26/24	52%/48%
Years of experience	-	5.0	5.3
Context	model creation/execution/both	8/2/16	16%/4%/32%

Table 1: Prior knowledge and demographics of the study participants

1.2   Interpretative scope

The amount of additional instructions that the study participants read from task annotations depends strongly on the type of presentation. Per participant, we counted how many additional instructions the process annotation allegedly prescribes. As "additional instruction" we define, for example, when process participants indicate that a certain component position is prescribed by the task annotation, although the annotation does not explicitly contain this instruction (and is not intended by us). A maximum of 4 additional instructions and a minimum of 0 could be read from one task annotation. Our analysis showed that, on average, one additional instruction was read from the pictorial representations. Most additional instructions were read from the image version of the stack instruction (1.4). Much less was read from the other representation formats (smaller than 0.3).

1.3   Execution time

The time measurement of the process model executions revealed that study participants became 18 seconds faster on average from the second model onwards. Tasks with pictorial annotations were completed most quickly (79 seconds), closely followed by diagrammatic annotations (81 seconds) and finally textual annotations (99 seconds).

1.4   User preferences and Model Comparison

Overall, 58% of the study participants preferred image-based instructions, 28% preferred diagram-based instructions and 14% preferred text-based instructions to teach themselves new activities. From the participants who preferred image-based instructions, about half (48%) achieved highest values in our experiments in terms of effectiveness, efficiency and satisfaction when executing process models with pictorial annotations. From those who preferred diagram-based instructions, 71% performed best with diagrammatic annotations. Subjects preferring text-based instructions (14%), 14% achieved highest values with textual annotations.

In the side-by-side comparison of the three representation formats at the end of the study, text (37%) and image (42%) annotations performed best in terms of the placing task. For the stacking and sorting task, study participants preferred the image version (77%) and (62%).