# The Effect of Process Length on Process Acceptance

Lars Drewes[1] Volker Nissen[2]

**Abstract:** According to the process acceptance theory, the acceptance of processes can have an influence on their correct execution [Mü19]. If deviations and manipulations of processes of any kind are to be excluded, it is necessary to understand which factors lead to a change in acceptance. In the present paper, a large scale experimental study is carried out to investigate the influence of the number of process activities and the process throughput time on acceptance. A generic purchasing process is implemented online and executed in variants by the participants of the study. Process acceptance is measured using a questionnaire in three dimensions of attitude (cognitive, affective, conative). The analysis demonstrates that there is a significant difference in acceptance with regard to varying process throughput time as a measure of process length.

**Keywords:** BPM; Process; Acceptance; Experiment; Amazon's Mechanical Turk

## 1 Introduction

The functional orientation that prevailed in companies for decades has meanwhile often been replaced by process orientation to improve enterprise performance and competitiveness. However, good process design and active process management are essential prerequisites for achieving process innovation, cost reduction, and customer satisfaction [BK12], [HC06], [MN14], [Mü15]. Moreover, processes must actually be carried out as intended in the design. The decision to initiate and execute a process as required is based on the acceptance that the process executor (acceptance subject) attributes to the process (acceptance object) within a certain (acceptance) context. If this acceptance does not exist or is too low, modifications of that process occur or even a refusal of the execution takes place. It is also possible that unofficial processes, so-called shadow processes, arise as a result or that similar, already existing substitutional processes experience a much higher acceptance and for this reason are preferred [MN14], [Mü15].

Such process deviations can not only result in business disadvantages, such as loss of customer satisfaction and thus loss of sales but can also pose a potential risk to people and the environment. One example is the persistent outbreak of MRSA bacteria in hospitals, which is due to the lack of attention paid to hygiene processes. A deviation into illegality is also possible if, for example, embargo processes are circumvented, which may result in severe penalties [Mi08], [MN14], [Mü15].

[1] Technische Universität Ilmenau, Wirtschaftsinformatik für Dienstleistungen, 98693 Ilmenau, lars.drewes@tu-ilmenau.de
[2] Technische Universität Ilmenau, Wirtschaftsinformatik für Dienstleistungen, 98693 Ilmenau, volker.nissen@tu-ilmenau.de

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Based on the above, it is of great relevance to investigate and understand influencing factors of process acceptance. Müllerleile [Mü19] established a basic theoretical concept on the subject of process acceptance along with it's measurement. Furthermore, he identified influencing factors on acceptance by means of a qualitative study. However, in order to understand the mechanisms of process acceptance more precisely and to be able to derive optimization potentials and actions, further investigations are necessary to determine the effect strength of individual factors as well as potential interactions of the aforementioned factors. To this end, the present paper starts by investigating process length as a potential key factor of influence, taking into account the following research questions:

1. How can the variable process length be operationalized?
2. Which effects on process acceptance can be measured and which interactions occur?

## 2 Method

To investigate the effects and interactions of process length on process acceptance, an online experiment is developed to test a range of difference hypotheses. More specifically, an executable purchasing process was implemented which is accessible on a server. The participants actively and directly experience the process as if it would be delivered in a live business environment. The crowdsourcing platform Amazon's Mechanical Turk (MTurk) is used for the acquisition of participants. This platform allows conducting a cost-efficient study with a large sample size.

Before using MTurk, the basic comparability of the results generated there with those from a more conventional empirical field study should be checked. Such a comparability was previously shown by various researchers. In the field of political science, Berinsky et al. [BHL12] examined MTurk as a tool for the acquisition of study participants. Within this study, an experiment that was conducted by conventional means that was then replicated using MTurk. The authors concluded that the response of MTurk participants to variation of the independent variables in the experiment was consistent with previous research. Such comparative studies have also been conducted in the fields of decision making and experimental economics, demonstrating that study results are comparable and therefore MTurk is a suitable alternative to conventional empirical settings [HRZ11], [PCP10]. Apart from these comparisons, MTurk has already been successfully used in further behavioral studies (cf. [ES10], [MW09], [SW11]) [MS12]. Based on these results, and against the background of significant cost and scale advantages over classical field studies when using a crowdsourcing platform, MTurk is employed within this study for recruiting study participants. Nevertheless, future replications of the study in field experiments are planned to provide further validation of the results and ensure their generalizability.

In the context of online experiments, it is necessary to introduce control measures that prevent unwanted behaviour of participants, which could result in manipulations or distortions of the

results. The platform may be used by people to achieve monetary gains quickly and without any effort. For this purpose, bots are often used, which run through automated studies. From the researcher's point of view, these bots generate unusable data, because they are designed to maximize the benefit for the developer and therefore only try to solve the tasks somehow and trigger a payment. To counteract this, Mason and Suri [MS12] recommend adding an additional task that serves as a CAPTCHA[3], limiting the influence of bots and ensuring proper identification of unwanted records. They also advise that participants should be aware that payment will not be made until the CAPTCHA is successfully completed [MS12]. Moreover, there is always a tendency for participants to not conscientiously fulfil the required task. This results in inconsiderate answers, which in turn appear as outliers in the statistical evaluation. In addition, some participants may only skim the instructions or answer arbitrarily. Overall, this leads to a reduction in the test strength of the experimental study [OMD09]. As a countermeasure Oppenheimer et al. [OMD09] have developed a methodological tool, the IMC (instructional manipulation check). This tool identifies whether or not the participants read the instructions carefully. This is achieved through embedding a particular question in the experimental material, with it's length and format of the answers corresponding to the answer possibilities of previous/following questions. However, this particular question tells the participant to actually ignore the answer options, but instead extract the correct solution from the question text itself. If the correct solution is not chosen, the IMC is considered failed [OMD09].

## 3 Setup of the Online Experiment

### 3.1 Definition of the Theoretical Constructs

According to previous work, with regard to the factor 'process length', it can be expected that short processes experience a higher process acceptance [Mü15], [Mü19]. However, it remains unclear whether the length refers to elapsed time or the number of necessary activities in a process. Accordingly, this independent variable is to be divided into the following: Activity-related process length (APL) and Process throughput time (PTT).

The activity-related process length refers to the number of activities required to complete a defined process[4]. Therefore, it constitutes an observable variable [DB16]. Possible repetitions or built-in loops are to be taken into account in the measurement as far as they are intended by the process. The number of repetitions depends on the respective repetition parameters. Thus, this variable is defined as follows: *Activity-related process length is the number of activities that are necessary to execute a process in its entirety. Loops deliberately planned in the process are to be included with the intended repetition parameter.*

[3] A CAPTCHA is a test, regardless of its form, that can be generated automatically. Only one person should be able to solve this test and none of the currently existing computer programs [vBL04].

[4] Based on the Davenport process definition [Da93].

Throughput time in production systems is the sum of the time elapsed for activities plus the waiting times for certain required events. It too is an observable variable [DB16], which is defined as follows, based on the general throughput time definition by Voigt [Vo18]: *Process throughput time is the duration in time units required to fully execute all activities that must be performed within a process, aggregated with the sum of the waiting times for specific required events and decisions.* Consequently, the process throughput time varies with the individual duration of the summarized elements.

### 3.2 Experimental Design

Since two independent variables are to be investigated at the same time within this experiment, a multi-factorial experimental design is chosen [DB16]. However, before the experimental design can be established, the characteristics of the variables must be determined. Regarding APL, four different variants exist. The variation is achieved by eliminating one or two activities, as is described in more detail in section 3.3. The PTT constitutes two variants. Since the total throughput time of the experiment and thus of the process should be kept short, the variation of the variables must be in the range of a few seconds. The values 10 and 20 seconds are chosen. Thus, a $4x2$ design is used (cf. Tab. 1) and a total of $8(4 * 2)$ factor level combinations are formed. The sub-sample sizes shall be equal. Accordingly, $8 * n = N$ participants, which are randomly assigned to the experimental groups, are required.

| | | **APL** | | | |
|---|---|---|---|---|---|
| | | $APL_1$ | $APL_2$ | $APL_3$ | $APL_4$ |
| **PTT** | $PTT_1$ | $S_{11}$ | $S_{12}$ | $S_{13}$ | $S_{14}$ |
| | $PTT_2$ | $S_{21}$ | $S_{22}$ | $S_{23}$ | $S_{24}$ |

Tab. 1: Test Design

This field of research is still relatively unexplored. For this reason, it is not possible to determine the probable effect strength from the results of previous studies [HJ02]. Therefore, an small effect strength ($f = 0.1$ or a $\eta^2 = 0.0099$) according to Cohen [Co88] is postulated, so that further planning is adjusted to be able to prove at least this small effect. According to the tool G*Power[5] [Fa07] a total sample size ($N$) of 2191 participants ($n = 2191/8 = 274$ per group) would be necessary. With this information, the IT architecture necessary for the experiment could be planned. Nevertheless, it is more efficient to gradually increase the sample size. On the one hand for cost reasons, on the other hand, to reduce the runtime of the experiment. One of the advantages of MTurk is that the sample size can be increased dynamically without changing the experimental design, if you have basic web programming skills [PCP10]. For the initial phase, 400 participants could be found. 33 of the records were removed due to CAPTCHA and IMC violations, so that a total of 367 participants were taken into account regarding to the statistical analyses.

[5] Version 3.1.9.4.

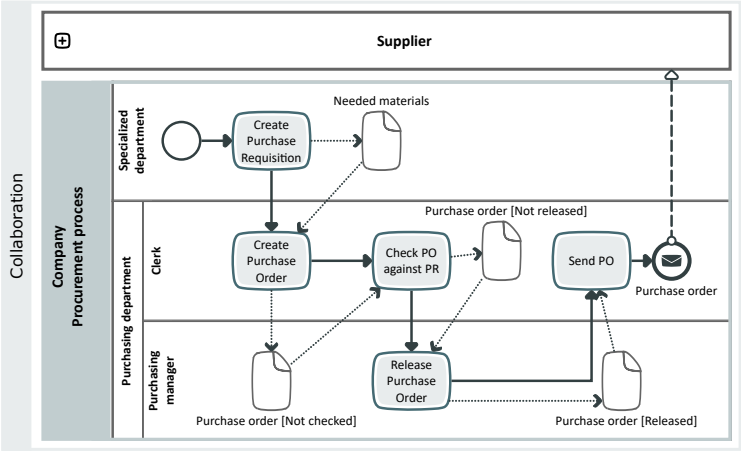


Fig. 1: Purchasing process used in the experiment

### 3.3 Process Design

A generic, fundamental purchasing process serves as the basis for the experiment (cf. Fig. 1). The goal is to achieve the closest possible proximity to the operational domain in practice to ensure external validity, which is often considered low for laboratory experiments, and thus allow a transfer of the results into practice. The process, including all variations, is implemented using the programming language JavaScript and a server architecture consisting of a JATOS[6] server and MTurk. Each experimental group is presented with one of the process variants outlined in Tab. 1.

Within the experiment, the variations of the independent variable APL is implemented as follows. Firstly, it is possible that the checking of a created purchase order (Check PO against PR) is omitted, which resembles an often occurring real-world problem. The omission is equivalent to the process optimization approach of 'omitting' according to Bleicher [Bl91]. Secondly, the manual sending of the purchase order could be omitted, as this is done automatically in the step following the release of the purchase order and can, therefore, be assigned to the activity 'Release purchase order'. This corresponds to the optimization approach 'Summarize' [Bl91]. The PTT is represented by a timer event after the release request, which automatically initiates the release after a previously defined time period ($t$). The values for $t$ are set to 10 and 20 seconds.

The study proceeds as follows: The participant is assigned the role of a purchaser in a company. His/her task is to purchase certain materials. Before the start of each run, a description of the task is presented to the participant so that he/she receives all necessary information to be able to carry out the process (in its respective variant) correctly. Before

[6] Just another tool for online surveys (JATOS)

the participant starts the actual purchasing process, a CAPTCHA is presented. In this CAPTCHA, the participant must select the process that matches the previous description in the notation event driven process chain. If this fails, the participant is led back to the introduction of the study and can then try again. The failed attempt is recorded internally in the metadata of the study for further evaluation. The actual purchasing process begins in an order cockpit. In this cockpit, the participant receives new purchase requisitions. When a timer expires, four new purchase order items are displayed so that the participant is able to order them in his or her role as purchaser. Each position contains the name of the material, the quantity required, and details of the vendor and the recommended payment method. In this experiment, the vendor and payment method data are identical for all items. The required materials can now be ordered in the next step using an order form. Once the participant has selected the materials and chosen the necessary vendor and payment method details, the entries can be compared with the purchase requisitions. The purchase order must then be released by the purchasing manager, represented here by the server and a timer event. When the timer expires, the functionality of the send button is enabled. After sending, the participant receives a success message and is forwarded to the IMC, which contains the simple question 'What position do you have in the company?' The answer options should be ignored as indicated in the text and the title should be clicked. Failures in this test are also logged in the metadata and the participant can try again. If the participant features too many failures, the associated data set is eliminated, because this inattention calls into question the validity of the participant's answers. 33 records were removed as stated in chapter 3.2. If successful, the questionnaire will be loaded. Different variations of the process are created with regard to the aforementioned omissions of the check activity, the manual sending of the order and of both of these activities. In addition, changes were made to the timer event. The experiment runs until the desired sample size is reached. Potential confounding variables such as age, origin, education level, etc. are recorded and controlled using established mechanisms like randomization.

### 3.4 Research Hypotheses

In order to analyze the effects on the dependent variable with regard to the two defined factors (independent variables), research hypotheses must first be formulated. These were deductively derived from previous work on process acceptance according to Müllerleile et al. [MN14], [Mü15], [Mü19].[7] Results in this previous work indicate that a process is more accepted if fewer variables have a negative effect on it. However, this effect differs depending on the considered variables, and therefore must be defined individually. In the case of the activity-based process length, the negative effect rises the more activities the process contains. In the case of the process throughput time, it rises the longer the process takes. Consequently, the hypotheses to be tested are the following:

[7] cf. [HM94]

- $EIH_{APL}$: If the participants in the specified purchasing process are confronted with fewer activities (minus 1 and 2 activities), regardless of the content, the process acceptance increases, measured by the three attitude dimensions of the measurement construct described in [Mü19].
- $EIH_{PTT}$: With decreasing process throughput time varied by the waiting time for a release (10 and 20 seconds) in the specified purchasing process, process acceptance increases, measured by the three attitude dimensions of the measurement construct described in [Mü19].

The three dimensions reflecting process acceptance comprise cognitive, affective and conative attitude. The cognitive dimension describes the attitude towards the process constructed by the knowledge of the process executant. The affective dimension includes motivational-emotional sensations. The conative dimension describes the inner willingness to act according to the actual process [Mü19], [Gü03].

## 4 Data Analysis

The measurement model according to Müllerleile [Mü19], adapted to the process of this experiment, is used to record process acceptance in the three attitude dimensions (cf. Tab. 2, Tab. 3 and Tab. 4).

| Question | Scale | Loading |
|---|---|---|
| I think this way of managing purchases is useful. | Yes/No | + |
| I think this way of managing purchases is important. | Yes/No | + |
| I think this way of managing purchases is complicated. | Yes/No | - |
| I think this way of managing purchases is laborious. | Yes/No | - |
| I think this way of managing purchases takes a long time. | Yes/No | - |
| I think I'm happy with the result. | Yes/No | + |
| I think this way of managing purchases is decent. | Yes/No | + |

Tab. 2: Cognitive Dimension

| Question | Scale | Loading |
|---|---|---|
| I would feel comfortable during the process. | Yes/No | + |
| I would feel included. | Yes/No | + |
| I would feel informed. | Yes/No | + |
| This purchasing process is troublesome. | Yes/No | - |
| This purchasing process is stressful. | Yes/No | - |
| I consider the purchasing process unpleasant. | Yes/No | - |
| I consider the purchasing process inconvenient. | Yes/No | - |
| I would feel insecure working the purchasing process. | Yes/No | - |
| I would feel annoyed working the purchasing process. | Yes/No | - |

Tab. 3: Affective Dimension

| Question | Scale | Loading |
|---|---|---|
| I would stand up for the maintaining of this purchasing process. | Yes/No | + |
| I would purchase materials exactly like this again. | Yes/No | + |
| I would have a proposal for modification. | Yes/No | - |
| I would like to delegate the process to another co-worker. | Yes/No | - |
| I would complain about this way of purchasing materials. | Yes/No | - |
| I would prefer another way of purchasing materials. | Yes/No | - |
| I would stand up for this purchasing process. | Yes/No | + |

Tab. 4: Conative Dimension

Each dimension contains a set of items that have been operationalized according to the DLF IIST Binary approach by Rossiter [Ro11]. In this regard, the participant can choose between the answer options Yes and No. An answer option n/a (not available) is intentionally not offered here since an answer based on the personal inferenced threshold of satisfaction is to be enforced [Ro11]. Additionally, each dimension concludes with a bipolar single-item scale with 5 levels [Mü19]:

- Cognitive: [Overall I reject this way of purchasing material] -2 -1 0 1 2 [Overall I approve this way of purchasing material]
- Affective: [Overall I had a bad feeling] -2 -1 0 1 2 [Overall I had a good feeling]
- Conative: Overall I would like to purchase materials like suggested in this scenario [unlikely] -2 -1 0 1 2 [likely]

As already shown, the single-item scales are coded by means of a uniform interval $[-2;2]$. The DLF IIST items are coded according to the effect coding. Which means, the values 1 and $-1$ are used. In the case of a regression, the regression coefficients can be interpreted as estimates of the treatment effects. This type of coding is commonly adopted within the General Linear Model for variance-analytical evaluations [BS16]. The loadings within the tables above indicate in which case the answer Yes is coded with 1 and No with $-1$ (Loading: +) and in which case Yes is coded with $-1$ and No with 1 (Loading: -). For each dimension, the response codes are aggregated according to Rossiter [Ro11] and thus provide the indicator of acceptance in this dimension and thus the input for the analyses. The statistical tests are carried out individually for each dimension.

The hypotheses presented are directed hypotheses. For this reason, a one-sided significance test is conducted. Prior, a descriptive-statistical test is carried out to assess the hypothesized direction of the effects. If the effects point in the wrong direction, a significance test is no longer necessary, since the alternative hypothesis cannot be accepted anyway [DB16]. The direction of the effects is analyzed by comparing the mean process acceptance of each dimension and variant. In the case of PTT, the mean acceptance must increase as the time decreases. As can be seen in Tab. 5, the average acceptance per acceptance dimension increases when time is shortened. Thus, the direction corresponds to the predicted one.

| PTT | Cognitive | Affective | Conative |
|---|---|---|---|
| 10 sec. | 5.04 | 5.88 | 3.76 |
| 20 sec. | 3.64 | 4.20 | 2.48 |

Tab. 5: Mean effects on the process acceptance per dimension (PTT)

For the variable APL, the hypothesized direction is confirmed if the average acceptance increases when the number of activities decreases. Two groups exist in which only one activity is omitted. The mean (cf. Tab. 6) between these two groups only differs slightly. The basic direction of the effects is noticeable and does not contradict the predicted one.

| APL | Cognitive | Affective | Conative |
|---|---|---|---|
| Full variant | 3.85 | 4.44 | 2.94 |
| -1 Activity (w/o Check) | 4.48 | 4.80 | 2.90 |
| -1 Activity (w/o Sending) | 4.30 | 4.85 | 3.18 |
| -2 Activities | 4.64 | 5.90 | 3.38 |

Tab. 6: Mean effects on the process acceptance per dimension (APL)

To test for significance, a two-way ANOVA is usually performed for a two-factorial design [DB16]. For an unbalanced experimental design as presented in this study, type III sums of squares must be used [BS16]. However, first of all, the requirements of ANOVA should be checked. The requirements are independence of the samples, the assumption of variance homogeneity and the assumption of normal distribution in each group [SR18]. The independence can be assumed as the participants have been acquired worldwide via MTurk and it has been technically ensured that each person can only participate once in the experiment. The variance homogeneity is to be demonstrated at this point by means of the Levene test [BS16]. The Levene test shows significant results for the affective dimension ($p_{Aff.} = 0,0020$). The results suggest that there is no variance homogeneity for this acceptance dimension. The cognitive and conative dimension show variance homogeneity ($p_{Cogn.} = 0,3970; p_{Con.} = 0,9540$). Since there is a violation of the prerequisite here, no two-factorial ANOVA should be applied, since it is not robust against this violation in an unbalanced design [MWT87]. Likewise, there is no normal distribution within the groups. The Shapiro-Wilk test for normal distribution yields a p-value $< 0.05$ for all dimensions. Normal distribution of the resulting measurement of acceptance for each group cannot be assumed. Since two requirements of two-factorial ANOVA have been violated, a non-parametric test, here an Aligned Rank Transform (ART) ANOVA, is performed [Wo11].

| | | Df | Df.res | F value | Pr(>F) | |
|---|---|---|---|---|---|---|
| 1 | APL | 3 | 359 | 0.15726 | 0.9250 | |
| 2 | PTT | 1 | 359 | 12.89487 | 0.0004 | *** |
| 3 | APL:PTT | 3 | 359 | 0.77340 | 0.5095 | |

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Tab. 7: ART ANOVA for the cognitive dimension

In all three dimensions, the PTT has a p-value < 0.01. This means that significant differences

| | | Df | Df.res | F value | Pr(>F) | |
|---|---|---|---|---|---|---|
| 1 | APL | 3 | 359 | 0.77047 | 0.5111 | |
| 2 | PTT | 1 | 359 | 7.55093 | 0.0063 | ** |
| 3 | APL:PTT | 3 | 359 | 1.71581 | 0.1634 | |

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Tab. 8: ART ANOVA for the affective dimension

| | | Df | Df.res | F value | Pr(>F) | |
|---|---|---|---|---|---|---|
| 1 | APL | 3 | 359 | 0.30814 | 0.8195 | |
| 2 | PTT | 1 | 359 | 7.31969 | 0.0071 | ** |
| 3 | APL:PTT | 3 | 359 | 1.07096 | 0.3614 | |

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Tab. 9: ART ANOVA for the conative dimension

between the groups are demonstrated. Since there are only two variants and thus groups (10 sec. and 20 sec.), post-hoc tests are not necessary. To evaluate the given hypothesis, the effect strength of the variables is still necessary [HM94]. This is given by Cohen's f and the eta-square (cf. Tab. 10) [Co88].

| Dimension | Cohens f | $\eta_2$ |
|---|---|---|
| Cognitive | 0.188 | 0.0341 |
| Affective | 0.144 | 0.0203 |
| Conative | 0.142 | 0.0196 |

Tab. 10: Effect strength per dimension for PTT

The differences between the APL groups are not statistically significant in any dimension. Consequently, the $EIH_{APL}$ hypothesis cannot be accepted. This can be due to various reasons, such as insufficient sample size, and will be discussed further in chapter 5. The experiment performed has shown that process acceptance differs significantly within the PTT groups, i.e. between a waiting time of 10 and 20 seconds. However, before the given hypothesis can be accepted, an evaluation of the measured effect strength is of relevance, since even small effects can show significance in large samples [BS16], [HM94]. As the field of research is new and no comparable studies exist, no meta-analyses can be used to assess the effect strength. In such cases, the mean effect according to Cohen [Co88] ($f = 0.25$) can be used as the minimum effect strength achievable, which is common in studies in the field of psychology. The results should be supported by replication or similar studies [SG89], [SR18]. In line with Westermann and Hager [WH82], a critical effect strength with an $f$ of 0.10 is assumed in this study, constituting a low effect when regarding Cohen's [Co88] definition. The critical effect strength has been chosen as a minimum threshold for the results of the analysis to be reasonable. With reference to these comparative values, the measured effect strengths ($f_{cognitive} = 0.188$, $f_{affective} = 0.144$, $f_{conative} = 0.142$) lead to a limitedly proven acceptance of the hypothesis $EIH_{PTT}$ in all dimensions [Ha87], [WH82].

# 5 Conclusion and Discussion

## 5.1 Discussion of the Results

The experiment has shown that process acceptance in all three dimensions regarding a generic, fundamental purchasing process significantly depends on the process throughput time. The process throughput time was changed by varying a waiting time deterministically. According to the results, waiting times must be reduced in process optimization activities (optimization approach 'accelerate' [Bl91]) to increase process acceptance. This can be achieved, for example, through automating the release procedures by setting volume limits for releases that a system can check. The complete digitalization of the purchase process would be advisable if the decision for a release depends solely on algorithmically testable conditions. As a result, the process would have a much reduced throughput time, and thus, an even higher acceptance.

A significant impact of the number of activities in the process could not be proven. The impact of the reduction by one or two activities was too small for the sample size of this study. The power of the test ($(1-\beta) = 0.0788186$ for the lowest case (conative dimension)) leads to a high probability that the $H_0$-hypothesis is incorrectly assumed.

## 5.2 Limitations of the study

A number of limitations exist that have to taken into consideration when interpreting the results of this study. The experiment performed resembles a laboratory experiment, whose external validity (generalizability of the result) may be limited, which is mainly dependent on the artificially created environment it is conducted in. However, the traceability of the results to the variation of the independent variables is very high [DB16] in our case. The generalizability has been increased by the type of process serving as a basis of the conducted experiment. The purchasing process has been chosen to be as generic and fundamental as possible and largely reflects the standard ordering process of the widely used SAP ERP system. Nevertheless, it is important to verify the results by means of further studies, if possible with real field experiments, and thus make them more generalizable.

Furthermore, person-related confounding variables occur. These comprise for example the age, the level of qualification, the country of origin and language (the investigation was conducted in English). These have been controlled by means of randomization in group allocation. Nevertheless, it is useful to analyze the distributions of these variables among the participants. As far as age is concerned, the majority of participants are distributed in the interval of 24 – 37 years. This is probably because MTurk is more likely to be used by people with an affinity for technology and that they are more likely to be found in this age interval [Mü19]. With regard to the degree of qualification, the most common degrees have been recorded. 56.7% of the participants hold a bachelor's degree, closely followed by college

students (11.2%) and persons with a Master's degree (10.9%). Therefore, it can be assumed that, in terms of educational level, the participants were able to fully understand the required task and to perform the process as required. Although MTurk makes it technologically possible to acquire participants worldwide, 63.5% of participants currently live in the USA and 27.2% in India. Thus, as the underlying process of the experiment is delivered in English, questions and answers are likely to have been understood by the participants.

### 5.3 Implications for Further Research

The significant difference in process throughput time within this study is based on the variation of waiting time. Although this is by definition an essential part of the throughput time, further investigations should be carried out with regard to it. For example, it should be investigated whether the measured effects are based on the fact that the participants had to wait for an event without further activity. For this purpose, the duration of a single activity, can be tested for significant differences. Furthermore, regression methods can be used to explain the relationship between process throughput time and process acceptance and thus enable predictions. Regarding APL, the $EIH_{APL}$ hypothesis could not be accepted in the existing design. In further research, an experimental design could be chosen that contains a clearer reduction of the process activities so that the effect of the reduction is more noticeable. Moreover, the number of participants should be increased. Finally, our experiments focus on two independent variables, while other variables of potential influence on process acceptance in practice are excluded for reasons of complexity. Future studies will aim at measuring the importance of such other factors and also their possible interdependences.

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