

Association for Information Systems

AIS Electronic Library (AISeL)

ECIS 2023 Research-in-Progress Papers

ECIS 2023 Proceedings

4-24-2023

I SEE NO FUN IN ENTERPRISE SYSTEMS: AN EXPLORATORY STUDY ON THE FIRST IMPRESSION USABILITY AND USER EXPERIENCE

Anika Nissen

University of Duisburg-Essen, anika.nissen@uni-due.de

Mareen Wienand

University of Duisburg-Essen, mareen.wienand@icb.uni-due.de

Reinhard Schütte

University of Duisburg-Essen, reinhard.schuette@icb.uni-due.de

Follow this and additional works at: https://aisel.aisnet.org/ecis2023_rip

Recommended Citation

Nissen, Anika; Wienand, Mareen; and Schütte, Reinhard, "I SEE NO FUN IN ENTERPRISE SYSTEMS: AN EXPLORATORY STUDY ON THE FIRST IMPRESSION USABILITY AND USER EXPERIENCE" (2023). *ECIS 2023 Research-in-Progress Papers*. 14.

https://aisel.aisnet.org/ecis2023_rip/14

This material is brought to you by the ECIS 2023 Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2023 Research-in-Progress Papers by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

I SEE NO FUN IN ENTERPRISE SYSTEMS: AN EXPLORATORY STUDY ON THE FIRST IMPRESSION USABILITY AND USER EXPERIENCE

Research in Progress

Anika Nissen, University of Duisburg-Essen, Germany, anika.nissen@uni-due.de

Mareen Wienand, University of Duisburg-Essen, Germany, mareen.wienand@icb.uni-due.de

Reinhard Schütte, University of Duisburg-Essen, Germany, reinhard.schuette@icb.uni-due.de

Abstract

Technology acceptance is crucial, if newly implemented enterprise systems (ES) in a company are to succeed. This is often addressed by end-user training during the implementation project. Perceived enjoyment and positive user experience (UX) have gained significant importance as technology acceptance factors. Yet, research on the design of such trainings is scarce, and literature with focus on perceived UX of ES even more so. This is in contrast to findings from other contexts which show that perceived UX may heavily impact user attitudes and learning motivation. As a first endeavour in this direction, this paper presents an exploratory pre-study on first impressions of main operating ES with regard to expected usability and UX. Results show that ES are rated low, especially when compared to a universal UX benchmark. We discuss how more positive first impressions may positively impact motivation to learn the system, which will be investigated in a follow-up study.

Keywords: Enterprise System, End-User Training, First Impression, Usability, User Experience.

1 Introduction

How much fun do you have when using your enterprise system (ES)? – A question that is surely too rarely asked in both academia and industry. Already the traditional technology acceptance model (TAM) has often been criticized for focusing only on cognitive appraisals, thereby neglecting the emotional experience during use (Agarwal & Karahanna, 2000). Works that tackled experiential factors in addition to the traditional TAM constructs show a clear picture: perceived enjoyment is a significant impact factor on user attitude toward the system (Abdullah & Ward, 2016; Agarwal & Karahanna, 2000; Hornbæk & Hertzum, 2017; Lu et al., 2009). This counts not only for hedonic systems which are mostly used in leisure time, but also for utilitarian systems that are used for work, too. Even more so, perceived enjoyment was found to have a stronger impact on user attitude toward the system than the classic TAM constructs of perceived usefulness and perceived ease of use (Hornbæk & Hertzum, 2017; Lu et al., 2009). A positive attitude toward the system leads to a higher motivation to use the system, and is therefore an impact factor on system adoption (Cronan & Douglas, 2013; Deranek et al., 2019; Mullins & Cronan, 2021). Given that ES have the highest number of, and most diverse user groups that have to work with the system within a company, these factors are of high relevance for ES adoption.

The attitude toward a system can be significantly toned by the first impression the user gets of the system. Research on the impacting factors of first impressions and how they influence further user behavior has been carried out by several researchers in the context of website design (Kim & Fesenmaier, 2008; Lindgaard et al., 2006; Thielsch et al., 2014; Tractinsky et al., 2006; Tuch et al., 2012). Thereby, several studies have identified that our first impressions can frame our attitudes through a “halo effect” which determines the further use of the website and purchase intentions in e-commerce

context (Lavalley & Umaphy, 2015; Tractinsky, 2004). In the context of ES, this halo effect on first impression might also be significantly impacted by the perceived experiential and usability-related (TAM) aspects of the ES, and might also have carry-over effects on system adoption (i.e., use intentions). Compared with ecommerce websites ES are more utilitarian, more complex and users usually do not use them on their free will, even though they need to work with them on an everyday basis (Chugh et al., 2017; Koh et al., 2011; Mullins & Cronan, 2021). Therefore, having a look on the impact the first impression has on the attitude can lead to new insights regarding the acceptance and success of ES implementation projects.

Besides first impression, another set screw to impact the attitude toward the ES is the end-user training (Knigge et al., 2017; Paa & Ates, 2013; Sadiq & Pirhonen, 2017). But even though a significant amount of ES implementation budget is spent on user training (Bingi et al., 2006; Chugh et al., 2017; Hanafizadeh et al., 2010; Kini, Ranjan & Basaviah, 2013; Koh et al., 2011; Umble et al., 2003), it is often stated that they do not sufficiently drive end-user adoption of ES. Against the prior outlined importance of not only usability-related aspects of ES (such as the TAM constructs), but also the expected and felt user experience (UX), one reason for this deficit in end-user training might be the lack of considering UX. Establishing positive UX already during first impressions, and therefore fostering a positive attitude toward the system might help to design more efficient ES end-user trainings. Subsequently, when the attitude is negative toward ES usage, the end-user training has to compensate more to achieve end-user adoption (Cronan & Douglas, 2013; Deranek et al., 2019; Mullins & Cronan, 2021). The framed importance of UX on ES learning and adoption has rarely been investigated by related literature. To close this gap and add further knowledge to this research stream, we investigate the first impressions of potential ES users for different operating ES, and against benchmarks from other products as a first exploratory step. This helps us to get the sentiment and general attitude toward common ES operated in industry. This paper therefore tackles the research question: *“how are expected usability and UX of common operating ES evaluated by potential users on first impression basis?”*

To address this question, we will perform three stages of analysis. In a first exploratory step we will investigate the first impressions of potential ES users for different operating ES and against benchmarks. This will help us to get the sentiment and general attitude toward common ES operated in industry. Building up on these results, we will carry out a follow up study with the goal to systematically investigate in how far attitudes formed during first impressions of ES will actually impact learner’s motivation and learning outcomes in end-user training. Additionally, we want to investigate the impact of different training styles on learning outcomes in ES training environments and on the perception and use of ES with the help of neuroimaging methods. This research in progress paper marks the first step of this analysis. The remainder of the paper is structured as follows: we first provide a literature overview on related works on first impressions of ES, as well as on how learner attitudes may shape learning outcomes. After that, we describe our survey that was carried out in an undergraduate enterprise systems course, and that was answered by students who highly likely use at least one of the included ES in their future work life. Before taking part in the survey, the students have been introduced to the concept of ES, its purpose and the goals of using these systems. Last, we discuss the findings of our survey and conclude the paper.

2 Background

2.1 First Impressions and their Impact on Attitude

“There is no second chance for a good first impression” - this quote is often stated and applies to systems with graphical user interfaces (GUIs) as well. In the context of website design, the impact of first impressions on user behavior has been researched well in the past decades (Saadé & Otrakji, 2007; Lim et al., 2000; Martínez-González & Álvarez-Albelo, 2021; Tella, 2019; Tractinsky, 2004; Tractinsky et al., 2006; Tuch et al., 2012; Weiss et al., 2017). Results show that the first impression of users toward a website can lead to longer lasting effects on the perceived credibility, user satisfaction, and attitude toward the system, as well as the intention to use the website (Ye et al., 2020). While this context reveals

the impact of first impressions on further use behavior, this perspective is scarce in the context of other systems such as ES.

When implementing an ES, it has been proved that the success of the implementation can strongly depend on user satisfaction (Deng et al., 2008). Therefore, it counts to impress users since the first moment they get in contact with the system; so that the formed attitude is positive and use intentions are increased (Deng et al., 2008). In line with the prior presented website design, there are studies suggesting that the attitude toward an interactive system is formed by the first impressions of a systems' visual appearance (Tractinsky et al., 2006). The further evaluation of the system is framed by the so called "halo effect" (Minge & Thüring, 2018; Tractinsky et al., 2006). Even though most of the studies focusing on this are in the context of e-commerce (Lavalley & Umapathy, 2015; Tractinsky, 2004) and website design (Hassenzahl & Tractinsky, 2006; Kim & Fesenmaier, 2008; Lindgaard et al., 2006; Thielsch et al., 2014; Tuch et al., 2012), there are a few studies that focus on ES (F. F. Calisir & Calisir, 2004; Y. Hwang, 2014). Compared to e-commerce and website design ES are more complex (Koh et al., 2011) and utilitarian. Whilst e-commerce and websites are used on a voluntary basis, ES end-users are somehow forced to use them for doing their jobs (Chugh et al., 2017). Furthermore, end-users have to work with ES on an nearly everyday basis, to make their implementation successful (Mullins & Cronan, 2021). Therefore, having a look on the impact the first impression has on the attitude can lead to new insights. In fact, it is proven that poor usability and an unintuitive user interface lead to decreased productivity and increased costs for companies (Babaian et al., 2006). This can be rooted back to the TAM, where perceived ease of use and perceived usefulness are two important impacting factors on use intention and actual use (Davis, 1989). Whether a system is perceived as useful and easy to use is also often investigated under the frame of usability. Usability can be defined as the extent to which a product can be used by specified users to achieve specified goals effectively, efficiently, and to the users' satisfaction in a specified use context (International Standards Organization (ISO), 2018). In this frame, the main characteristics of usability are also defined as learnability, efficiency of system use, frequency of user errors, and the subjective user satisfaction (Nielsen, 1992). Further extending the user satisfaction, Hwang (2014) state that the willingness of an individual to try out any new system is dependent on the UX. UX goes beyond the more cognitive aspects of usability (and the TAM), and also incorporates whether a system is fun to use and elicits positive emotion (Hassenzahl, 2008; Hassenzahl & Tractinsky, 2006). Therefore, it may be stated that the expected usability and UX on first impressions form the general attitude toward an ES, and that they can impact the willingness to learn the system use.

2.2 Attitude Impact on Learning Outcomes

As pointed out before, the system's learnability is a key characteristic of the system's usability. Calisir and Calisir (2004) carried out an empirical study and explored that the user interface can have a strong influence on the attitude of users toward an ES. This is related to the perceived usefulness and usability that have a strong influence on the user satisfaction. It is stated that user satisfaction is strongly related to the perceived usefulness of the ES as a user that perceives the system as useful is more willing to use it (F. Calisir & Calisir, 2004). Also in this study, it has been found that the learnability has an influence on end-user satisfaction. Therefore, it is stated that in order to be successful, ES need to be developed in a way they are perceived high in usability (F. Calisir & Calisir, 2004). This is supported by the findings of Babaian et al. (2006) who carried out a field study investigating how users interact with ES. They state that the system should be designed to act as the user's partner in the process of goal achievement. Furthermore, it is stated that improving the usability of the system can have a positive impact on the effectiveness of training, user satisfaction, and on the system usage (Babaian et al., 2006). Another factor influencing the user satisfaction might be the systems' flexibility. Scherrer-Rathje and Boyle (2012) investigated in their study that flexibility in ES can create the feeling in end-users that the ES is responding to their business needs (Scherrer-Rathje & Boyle, 2012).

As stated before, the UX and user satisfaction are important factors when it comes to IT success (Babaian et al., 2006; Mullins & Cronan, 2021). In line with usability, UX and satisfaction can be formed by high learnability of the system (Babaian et al., 2006; Cronan & Douglas, 2013). In literature, learnability is

defined as how easy it is to learn the system use, so that users can start working with it quickly (Scott, 2005). Learning outcomes can improve when the attitude toward the system is positive (Cronan & Douglas, 2013), e.g., due to high expected usability and UX. This is supported, as learning system use through a “fun to use” ERP simulation game has shown to reduce the barriers and prejudices against the ERP system (Charland et al., 2015; Soellner, 2021), and thus, the learning effectiveness was significantly improved (Cronan & Douglas, 2013). The findings of Sun et al. (2008) contribute to this, who state that the attitude of a learner toward the system is an important factor for learning. To summarize related literature, the perceived usability and UX of an ES are crucial impacting factors on overall attitude formation. We suppose that in case of very positive usability and UX expectations, the end-user adoption through end-user training will be higher and associated with less barriers compared to when the expected UX and usability are low. Therefore, we hypothesize that:

H1: *A positive first impression (UX, usability) toward ES leads to a positive attitude toward ES.*

H2: *A positive attitude toward ES leads to a higher willingness to learn how to use the system.*

Before we investigate, if these assumptions hold true, we wish to get a general impression of how expected usability and UX are currently evaluated by future ES users. Thereby we inform H1 by “indexing” the first impressions on expected UX and usability for four operating ES. This first analysis is covered in this paper. We will then use this index as a benchmark to compare the self-reported results of our follow-up neuroIS study in which participants will then actually use the systems and the carry-over effects on learnability and learning effectiveness is tested.

3 Method

Sample. We distributed the questionnaire in an undergraduate enterprise systems class to approximately 300 students. Before handing out the questionnaire, the students have been introduced to the concepts of ES and its goals within the lecture. A total of $N = 109$ students filled out the questionnaire completely. The participants are in average $M = 21.8$ years old ($SD = 3.8$, $Min = 18$, $Max = 41$). The majority (75.2%) of respondents identified themselves as male, whereas 24.8% identified as female. Most of the students were enrolled in business administration/ economics (40.1%), followed by business information systems students (22%), and students enrolled in computer science/ systems engineering (23%). The remainder studied either macroeconomics (0.9%), or one of the named studies in a teaching degree for secondary schools (2.8%). Next to the demographics, we also wanted to get a feeling for the students’ familiarity with the shown ES. We included Microsoft Dynamics, Salesforce, Oracle NetSuite, and SAP S/4HANA as widely used ES (Ivanović & Marić, 2021; Katuu, 2021; Statista, 2022). It turns out, the familiarity with any of the included ES from SAP, Microsoft, Salesforce, and Oracle was rather low. In particular 61.5% did not know SAP ERP, 68.8% stated they do not know Microsoft ERP, 87.2% were not familiar with the system provided by Salesforce, and 89% with Oracle ERP. Thus, it can be stated that the familiarity with the systems was in most of the cases not given, and therefore the results of this survey represent the very first impressions of potential system users without prior knowledge about the system’s use.

Study Design. To receive first insights into the sentiment about operating ES, we selected the prior 4 presented ES as they are mostly utilized in industry until 2020 (Statista, 2022). To keep the GUIs comparable, we included the finance overview page of the respective systems named above as stimuli (Figure 1). We chose the finance overview pages of each system, because depending on the role the user within a company, a different landing page will be shown. For this study, we aimed at using a page that is largely consistent across systems and the financial overview page provided the largest level of standardization. Furthermore, finance is often subject to comparisons and benchmarks (Mayer et al., 2018). To get the first impressions of expected usability and UX, we used the standardized scales of the

System Usability Scale (SUS)¹ and the short version of the User Experience Questionnaire (UEQ)² (Laugwitz et al., 2008; Schrepp et al., 2017c, 2017a, 2014). The SUS is a simple ten item scale to use when doing usability evaluations (Brooke, 2013). It can be used to assess the usability of products, web sites, TV applications, systems etc. and has proven to be reliable and valuable (Bangor et al., 2009; Brooke, 2020). The UEQ aims at measuring the user experience in a fast and easy way (Schrepp et al., 2014). As the UEQ itself contains more than 26 items, we opt for the short version of it, containing no more than 8 items to reduce the effort for the participants (Schrepp et al., 2017c). Both – SUS and UEQ have been presented with a 7-point Likert scale. Upon opening the questionnaire, students were welcomed with a short introductory text about the goal of the questionnaire and asked for their consent to participate. When clicking on the “next” button and thereby giving their consent, they were randomly presented one of the 4 included ES with the questions from the SUS and UEQ. After that, the other three were similarly shown in random order and with the same questions each. After all four ES were evaluated, students were asked demographic questions, as well as which studies they are enrolled in, and if they were familiar with any of the systems. After that, students were thanked for their participation and the questionnaire closed. Students participated of their own free will – their answers were anonymized so that their participation in the study could not be rooted back to any of the students.

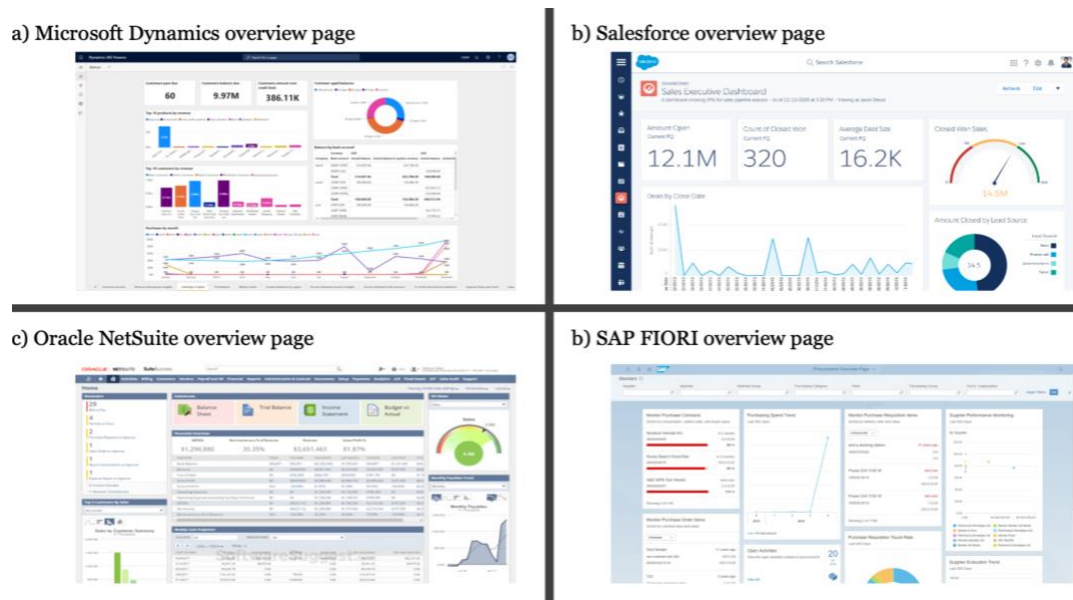


Figure 1: Used Stimuli in the Online Questionnaire

Data Analyses. The data were analyzed in jupyter notebooks using R, as well as the UEQ data analysis Excel sheets provided with the questionnaire that allow to compare the UX ratings to a benchmark established in related literature (Schrepp, 2019). Data were analyzed in 2 steps: *i*) we investigated if there were significant differences between the included ES GUIs in the expected usability and UX each, and *ii*) we use the UEQ benchmark established in related literature and compare the UX ratings of the ES GUIs to this benchmark. The UEQ benchmark is a synopsis of 163 UEQ and serves to answer the question how well the product assessed has been evaluated compared to other products (Schrepp et al., 2017b). To further reproducible science, the questionnaire, the raw data, as well as the data analyses are shared as a public repository on the author’s github (<https://github.com/AnikaNissen/attitude-EUT>).

¹ The original scales can be reviewed on the following webpage: <https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html>

² The original scales and data analysis Excel sheets can be reviewed on the following webpage: <https://www.ueq-online.org>

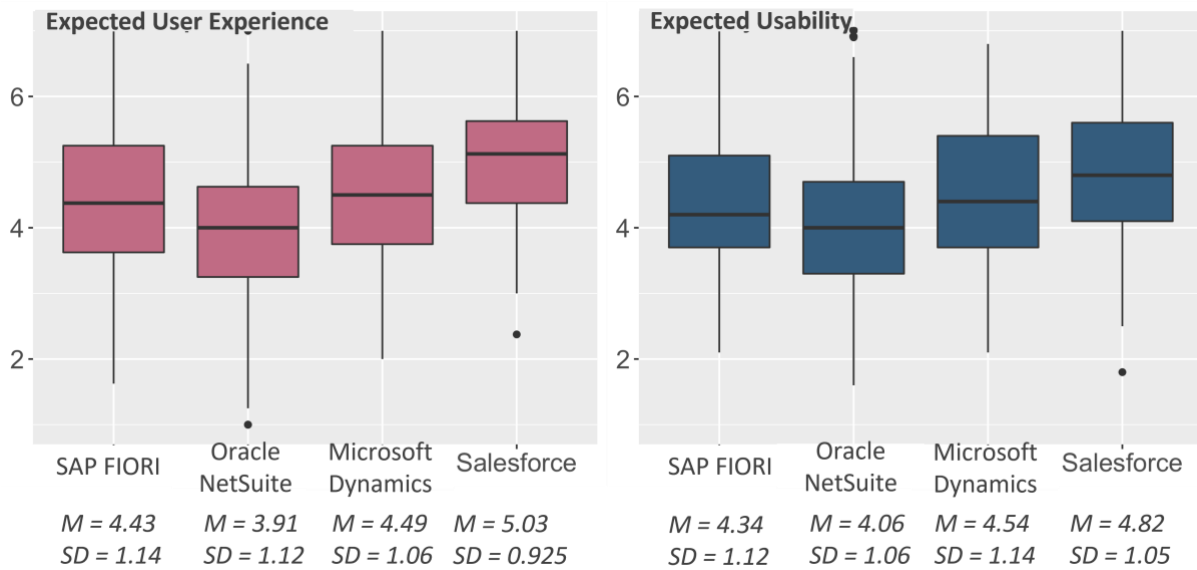


Figure 2: Barplots of UX and Usability Results per ES GUI

Results. At first, we ran repeated-measures ANOVAs for the expected usability and UX, and explored potential differences between the included ES.

Regarding their *expected usability*, significant differences between the vendors ($F(3, 432) = 9.486, p < .001, \eta_p^2 = .062$). Post-hoc tests reveal that once again, Salesforce was rated highest in expected usability ($M = 4.82, SD = 1.05$), followed by SAP FIORI ($M = 4.34, SD = 1.12$) and Microsoft Dynamics ($M = 4.54, SD = 1.14$) in the middle, and Oracle NetSuite as the lowest rated ES ($M = 4.06, SD = 1.06$). For expected usability, however, only the differences between SAP FIORI and Salesforce ($t(108) = -3.48, p_{Holm} = .003$), Oracle NetSuite and Microsoft Dynamics ($t(108) = -3.85, p_{Holm} = .001$), and Oracle NetSuite and Salesforce ($t(108) = -5.84, p_{Holm} < .001$) reached significance. The difference between Oracle NetSuite and both SAP FIORI and Microsoft Dynamics, as well as between Salesforce and Microsoft Dynamics were not significant (all p 's $> .05$).

The *analysis for expected UX* shows that there are significant differences between the included ES GUIs ($F(3, 432) = 26.1, p < .001, \eta_p^2 = .124$). Post-hoc tests reveal that while there was no significant difference in the expected UX of SAP FIORI and Microsoft Dynamics ($t(108) = -0.409, p_{Holm} = .683$), there were significant differences between all other vendors ($p_{Holm} \leq .001$). Overall, Salesforce was evaluated highest in expected UX ($M = 5.03, SD = 0.925$), both SAP FIORI ($M = 4.43, SD = 1.14$) and Microsoft Dynamics ($M = 4.49, SD = 1.06$) were somewhere in the middle, and Oracle NetSuite was rated lowest ($M = 3.91, SD = 1.12$) (see Figure 2 for a comprehensive overview of expected usability and UX ratings).

To get an idea of how the first impression evaluations of expected UX would compare to a benchmark, we also used the benchmark analysis option in the data analysis sheet that is delivered with the UEQ questionnaire. The results of this comparison are depicted in Figure 3. We can see that while the Salesforce GUI is overall rated slightly above average, all of the other included ES GUIs are ranked below the average of the benchmark and even may be labeled as “bad”.

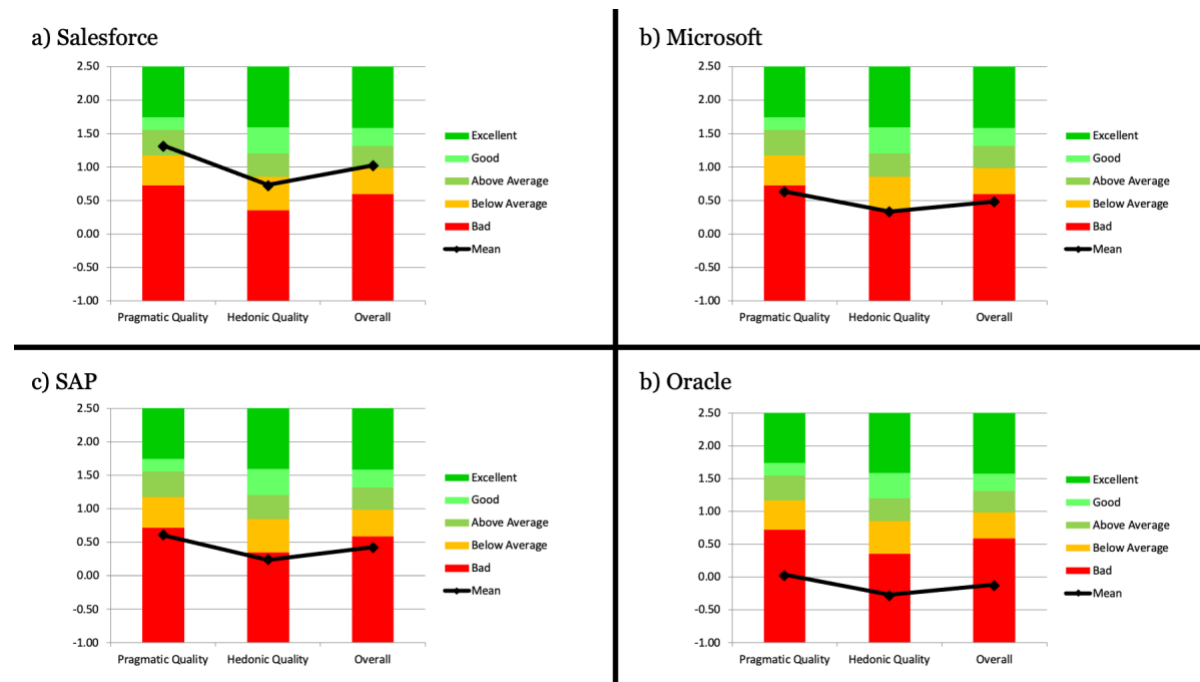


Figure 3: Results of Expected UX of ES in Comparison to the UEQ Benchmark

4 Discussion

Our results show that the expected usability and UX of main operating ES are rated rather poorly. While Salesforce was rated highest in both expected usability and UX, it was only slightly above the UEQ benchmark when compared to other products. All of the other platforms were rated around the Likert-scale's middle (4) and lay significantly below the benchmark average. It is noted that the investigated systems have high utilitarian, and rather low hedonic value due to their application context. Furthermore, the end-users have to use the systems due to their employers' IT landscape and cannot freely choose to use the systems as they would in leisure time. Even more so could low expected usability and UX pose barriers to end-user acceptance before even using the ES. This is supported in related works who found that perceived enjoyment and UX are significant impact factors for behavioral intentions in ES, too (Billyan & Irawan, 2021; Lin & Bhattacharjee, 2010). As a result, both a negative expected UX and poor expected usability has shown to be detrimental to productivity with the system (Babaian et al., 2006). As a consequence we question why expected usability and UX are not fostered more when designing ES?

Several works have shown how influential experiential factors are on behavioral intentions in ES (Billyan & Irawan, 2021; G. J. Hwang, 2014; Lakawathana, 2018). Other researchers that identified the significant learning challenges that come with the high complexity of ES, proposed gamification in the learning process as an approach (Léger et al., 2007; Léger et al., 2011). They showed that increasing perceived enjoyment through gamification, learning outcomes notably improved. While their approach is undoubtedly promising, we wonder if we cannot improve learning outcomes even before the actual training is started. Attitude theories such as the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) show how attitudes impact behavioral intentions. As we have elaborated in the background section, attitudes themselves can be significantly impacted by first impressions. While the here stated relations are still based on theory, we wish to tackle this in our follow-up study. More precisely, we will systematically investigate in how far there is a relationship between attitudes formed at first impressions, and attitudes after training for one of the operating ES vendors. Furthermore, we will explore the impact of attitude toward the system on learning effectiveness and outcomes to further improve end-user training for ES.

Although being a work in progress, this paper has significant impact for practitioners. ES cover nearly every part of the company and thus are used by a significantly high amount of users. Therefore, the attitude and acceptance of ES should be focused. Although significant improvements have been made in the past years, and the idea of UX and making interactions enjoyable has been increasingly acknowledged by large ES vendors, our results show that there is still significant advancement needed. Reasons for why implementing UX more into ES development has been neglected for too long and is still a sluggish process may be their high complexity, and the variety in user needs on the one hand, but also their long development history on the other. In line with this, it is noticeable that Salesforce as being the “youngest” software provider (est. 1990), compared to SAP (est. 1972), Microsoft (est. 1975) and Oracle (est. 1977), is ranked best within this study. It may therefore be a reasonable course of action to dismantle from old concepts, and focus on more user-centered design. A high focus on user-centered design has shown to increase end-users enjoyment, and therefore, end-user acceptance (Y. Hwang, 2014; Prasetyo & Soliman, 2021; Sharma & Chowdhury, 2021). Yet, its systematic investigation in related literature is still scarce, and ES often have interfaces that were not designed with the end-user in mind (Prasetyo & Soliman, 2021). As a consequence, we wish to show how significant this impact is on learning how to use the systems, given that this is a crucial prerequisite for ES acceptance and productivity when using the system. Next to this high practical relevance, we also contribute to the body of literature that brings website design/ interaction design, educational, and IS research in the context of ES together. By this, we will generate a better understanding of how first impressions and attitudes in ES impact learning motivation and learning outcomes. This will not only further the development of innovative training methods for end-user training, but also inform the design of ES in a way that has the end-user in mind.

Finally, despite this great contribution, our research also comes with some limitations. In this work-in-progress we compared the results of the short UEQ to the benchmark included in the provided UEQ spreadsheet. It has to be noted that the benchmark was developed with the full UEQ scale and might therefore bias the results to some extent. The authors of the UEQ state, however, that the resulting bias is rather small and may be neglected. Furthermore, we only considered expected usability and UX on first impression basis in inexperienced users that are familiar with the concept and goals of ES and their implementation in a company. Depending on prior use experiences with one of the ES, the results may of course differ from our findings. In future research, we therefore need to re-run this study with participants that use ES on a regular basis and evaluate whether the here established index counts for experience ES users as well. In the direct follow-up study to this paper, we will assess the users’ knowledge prior to the training and after training. Furthermore, to test our hypotheses and to validate whether the proposed relationships between the concepts hold true, we will also run structured equation modelling (SEM). To also get insights into not directly observable processing of the learning materials and system use such as attention and cognitive load, we will complement questionnaire data with neuroimaging to get further insights.

5 Conclusion

This work in progress shows how inexperienced users rate usability and UX at first impression of the four main operating ES in industry. The results reveal that although there has been progress in the past years, this is still not enough and that more user-centered designs are required. We reference to several works that claim how perceived enjoyment and hedonic quality is crucial for behavioral intentions in ES as well and therefore, our initial results are strengthened. This has a high practical relevance, as higher expected UX leads to more positive attitude, which may increase system use motivation and productivity. To explore what this means for end-user training, we will systematically investigate the impact of first impression ES perceptions, different teaching styles to train ES use, and the actual learning outcomes in a follow-up study. This work-in-progress served as a first indexing analysis and has revealed that we might need to develop user trainings especially for complex systems such as ES more with the user in mind, focusing on increasing use motivation and thus, make them more fun to see and to use.

References

- Abdullah, F., & Ward, R. (2016). Developing a General Extended Technology Acceptance Model for E-Learning (GETAMEL) by analysing commonly used external factors. *Computers in Human Behavior*, 56, 238–256. <https://doi.org/10.1016/j.chb.2015.11.036>
- Agarwal, R., & Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*, 24(4), 665–694.
- Babaian, T., Lucas, W., & Topi, H. (2006). Improving ERP Usability Through User-System Collaboration. *International Journal of Enterprise Information Systems (IJEIS)*, 2(3), 10–23. <https://doi.org/10.4018/jeis.2006070102>
- Bangor, A., Kortum, P., & Miller, J. (2009). Determining What Individual SUS Scores Mean: Adding an Adjective Rating Scale - JUX. *Journal of Usability Studies*, 4(3), 114–123. <https://uxpajournal.org/determining-what-individual-sus-scores-mean-adding-an-adjective-rating-scale/>
- Billyan, B. F., & Irawan, M. I. (2021). Analysis of Technology Acceptance of Enterprise Resource Planning (ERP) System in the Regional Office of PT. XYZ throughout Indonesia. *Journal of Physics: Conference Series*, 1844(1). <https://doi.org/10.1088/1742-6596/1844/1/012008>
- Bingi, P., Sharma, M. K., & Godla, J. K. (2006). Critical Issues Affecting an ERP Implementation. *Information Systems Management*, 16(3), 7–14. <https://doi.org/10.1201/1078/43197.16.3.19990601/31310.2>
- Brooke. (2013). SUS: A Retrospective. *Journal of Usability Studies*, 8(2), 29–40.
- Brooke, J. (2020). SUS: A „Quick and Dirty“ Usability Scale. *Usability Evaluation In Industry, November 1995*, 207–212. <https://doi.org/10.1201/9781498710411-35>
- Calisir, F., & Calisir, F. (2004). The relation of interface usability characteristics, perceived usefulness, and perceived ease of use to end-user satisfaction with enterprise resource planning (ERP) systems. *Computers in Human Behavior*, 20(4), 505–515. <https://doi.org/10.1016/j.chb.2003.10.004>
- Calisir, F. F., & Calisir, F. F. (2004). The relation of interface usability characteristics, perceived usefulness, and perceived ease of use to end-user satisfaction with enterprise resource planning (ERP) systems. *Computers in Human Behavior*, 20(4), 505–515. <https://doi.org/10.1016/j.chb.2003.10.004>
- Charland, P., Léger, P. M., Cronan, T. P., & Robert, J. (2015). Developing and assessing ERP competencies: Basic and complex knowledge. *Journal of Computer Information Systems*, 56(1), 31–39. <https://doi.org/10.1080/08874417.2015.11645798>
- Chugh, R., Sharma, S. C., & Cabrera, A. (2017). Lessons learned from enterprise resource planning (ERP) implementations in an australian company. *International Journal of Enterprise Information Systems*, 13(3), 23–35. <https://doi.org/10.4018/IJEIS.2017070102>
- Cronan, T. P., & Douglas, D. E. (2013). Assessing ERP learning (management, business process, and skills) and attitudes. *Journal of Organizational and End User Computing*, 25(2), 59–74. <https://doi.org/10.4018/joeuc.2013040104>
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Management Information System Research Center*, 13(3), 319–340.
- Deng, X., Doll, W. J., Al-Gahtani, S. S., Larsen, T. J., Pearson, J. M., & Raghunathan, T. S. (2008). A cross-cultural analysis of the end-user computing satisfaction instrument: A multi-group invariance analysis. *Information and Management*, 45(4), 211–220. <https://doi.org/10.1016/j.im.2008.02.002>
- Deranek, K., McLeod, A., & Schmidt, E. (2019). ERP Simulation Effects on Knowledge and Attitudes of Experienced Users. *Journal of Computer Information Systems*, 59(4), 373–383. <https://doi.org/10.1080/08874417.2017.1373610>
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory*

- and Research*. Addison-Wesley. <https://people.umass.edu/aizen/f&a1975.html>
- George Saadé, R., & Alexandre Otrakji, C. (2007). First impressions last a lifetime: effect of interface type on disorientation and cognitive load. *Computers in Human Behavior*, 23(1), 525–535. <https://doi.org/10.1016/j.chb.2004.10.035>
- Hanafizadeh, P., Gholami, R., Dadbin, S., & Standage, N. (2010). The Core Critical Success Factors in Implementation of Enterprise Resource Planning Systems. *International Journal of Enterprise Information Systems*, 6(June), 82–111. <https://doi.org/10.4018/jeis.2010040105>
- Hassenzahl, M. (2008). User Experience (UX): Towards an experiential perspective on product quality. *IHM '08: Proceedings of the 20th Conference on l'Interaction Homme-Machine*, 11–15.
- Hassenzahl, M., & Tractinsky, N. (2006). User experience - A research agenda. *Behaviour and Information Technology*, 25(2), 91–97. <https://doi.org/10.1080/01449290500330331>
- Hornbæk, K., & Hertzum, M. (2017). Technology Acceptance and User Experience: A Review of the Experiential Component in HCI. *ACM Transactions on Computer-Human Interaction*, 24(5), 1–30. <https://doi.org/10.1145/3127358>
- Hwang, G. J. (2014). Definition, framework and research issues of smart learning environments - a context-aware ubiquitous learning perspective. *Smart Learning Environments*, 1(1). <https://doi.org/10.1186/s40561-014-0004-5>
- Hwang, Y. (2014). User experience and personal innovativeness: An empirical study on the Enterprise Resource Planning systems. *Computers in Human Behavior*, 34, 227–234. <https://doi.org/10.1016/j.chb.2014.02.002>
- International Standards Organization (ISO). (2018). *ISO 9241-11:2018(en), Ergonomics of human-system interaction — Part 11: Usability: Definitions and concepts*. <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en>
- Ivanović, T., & Marić, M. (2021). Application of modern Enterprise Resource Planning (ERP) systems in the era of digital transformation. *Strategic Management*, 26(4), 28–36. <https://doi.org/10.5937/STRAMAN2104028I>
- Katuu, S. (2021). Trends in the Enterprise Resource Planning Market Landscape. *Journal of Information and Organizational Sciences*, 45(1), 55–75. <https://doi.org/10.31341/JIOS.45.1.4>
- Kim, H., & Fesenmaier, D. R. (2008). Persuasive design of destination web sites: An analysis of first impression. *Journal of Travel Research*, 47(1), 3–13. <https://doi.org/10.1177/0047287507312405>
- Kini, Ranjan, B., & Basaviah, S. (2013). Critical Success Factors in the Implementation of Enterprise Resource Planning Systems in Small and Midsize Businesses: Microsoft Navision Implementation. *International Journal of Enterprise Information Systems*, 9(1), 97–117. <https://doi.org/10.4018/jeis.2013010106>
- Knigge, M., Prifti, L., Kienegger, H., & Krcmar, H. (2017). Teaching enterprise organization and enterprise resource planning systems in schools: Playing a serious game with pupils. *IEEE Global Engineering Education Conference, EDUCON*, 486–495. <https://doi.org/10.1109/EDUCON.2017.7942891>
- Koh, S. C. L., Gunasekaran, A., & Goodman, T. (2011). Drivers , barriers and critical success factors for ERP implementation in supply chains : A critical analysis. *Journal of Strategic Information Systems*, 20(4), 385–402. <https://doi.org/10.1016/j.jsis.2011.07.001>
- Lakawathana, P. (2018). Factors affecting the enjoyment of ERP software learning for non-IT learners. *Proceedings of 2018 5th International Conference on Business and Industrial Research: Smart Technology for Next Generation of Information, Engineering, Business and Social Science, ICBIR 2018*, 602–607. <https://doi.org/10.1109/ICBIR.2018.8391269>
- Laugwitz, B., Held, T., & Schrepp, M. (2008). LNCS 5298 - Construction and Evaluation of a User Experience Questionnaire. In *LNCS (Bd. 5298)*.
- Lavalley, C., & Umapathy, K. (2015). *Conceptual Model of Website Design Elements that Influences Credibility and Trustworthiness*. <http://aisel.aisnet.org/sais2015/11>

- Léger, P.-M., Robert, J., Babin, G., Pellerin, R., & Wagner, B. (2007). *ERPSIM*.
- Léger, Pierre-Majorique, Charland, P., Feldstein, H. D., Robert, J., Babin, G., & Lyle, D. (2011). Business simulation training in information technology education: Guidelines for new approaches in IT training. *Journal of Information Technology Education: Research*, 10(1), 39–53. <https://doi.org/10.28945/1362>
- Lim, K. H., Benbasat, I., & Ward, L. M. (2000). The Role of Multimedia in Changing First Impression Bias. *Information Systems Research*, 11(2), 115–136. <https://doi.org/10.1287/isre.11.2.115.11776>
- Lin, C. P., & Bhattacharjee, A. (2010). Extending technology usage models to interactive hedonic technologies: A theoretical model and empirical test. *Information Systems Journal*, 20(2), 163–181. <https://doi.org/10.1111/j.1365-2575.2007.00265.x>
- Lindgaard, G., Fernandes, G., Dudek, C., & Brown, J. (2006). Attention web designers: You have 50 milliseconds to make a good first impression! *Behaviour and Information Technology*, 25(2), 115–126. <https://doi.org/10.1080/01449290500330448>
- Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in Human Behavior*, 25(1), 29–39. <https://doi.org/10.1016/j.chb.2008.06.002>
- Martínez-González, J. A., & Álvarez-Albelo, C. D. (2021). Influence of site personalization and first impression on young consumers' loyalty to tourism websites. *Sustainability (Switzerland)*, 13(3), 1–18. <https://doi.org/10.3390/su13031425>
- Mayer, J. H., Razaqi, T., Esswein, M., & Quick, R. (2018). Zero-quartile benchmarking - A forward-looking prioritization of digital technologies for a company's transformation. *International Conference on Information Systems 2018, ICIS 2018*, 1–17.
- Minge, M., & Thuring, M. (2018). Hedonic and pragmatic halo effects at early stages of User Experience. *International Journal of Human Computer Studies*, 109, 13–25. <https://doi.org/10.1016/j.ijhcs.2017.07.007>
- Mullins, J. K., & Cronan, T. P. (2021). Enterprise systems knowledge, beliefs, and attitude: A model of informed technology acceptance. *International Journal of Information Management*, 59(March), 102348. <https://doi.org/10.1016/j.ijinfomgt.2021.102348>
- Nielsen, J. (1992). The Usability Engineering Life Cycle. *Computer*, 25(3), 12–22. <https://doi.org/10.1109/2.121503>
- Paa, L., & Ates, N. (2013). Critical success factors of e-learning scenarios for erp end-user training. In *Lecture Notes in Information Systems and Organisation* (Bd. 4, S. 87–100). Springer Heidelberg. https://doi.org/10.1007/978-3-642-37021-2_8
- Prasetyo, Y. T., & Soliman, K. O. S. (2021). Usability Evaluation of ERP Systems: A Comparison between SAP S/4 Hana Oracle Cloud. *2021 IEEE 8th International Conference on Industrial Engineering and Applications, ICIEA 2021*, 120–125. <https://doi.org/10.1109/ICIEA52957.2021.9436697>
- Sadiq, M., & Pirhonen, A. (2017). Finding usability problems in ERP application help and end-user training material. *Proceedings of the International Conference on Interfaces and Human Computer Interaction 2017 - Part of the Multi Conference on Computer Science and Information Systems 2017*, 222–226.
- Scherrer-Rathje, M., & Boyle, T. A. (2012). An End-User Taxonomy of Enterprise Systems Flexibility: Evidence from a Leading European Apparel Manufacturer. *Information Systems Management*, 29(2), 86–99. <https://doi.org/10.1080/10580530.2012.660820>
- Schrepp, M. (2019). *Eine modulare Erweiterung des User Experience!estionnaire Hinweise zur Anwendung in praktischen Projekten*. <https://doi.org/10.18420/muc2019-up-0108>
- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017a). Construction of a Benchmark for the User Experience Questionnaire (UEQ). *International Journal of Interactive Multimedia and Artificial Intelligence*, 4(4), 40. <https://doi.org/10.9781/ijimai.2017.445>

- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017b). Construction of a Benchmark for the User Experience Questionnaire (UEQ). *International Journal of Interactive Multimedia and Artificial Intelligence*, 4(4), 40. <https://doi.org/10.9781/ijimai.2017.445>
- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017c). Design and Evaluation of a Short Version of the User Experience Questionnaire (UEQ-S). *International Journal of Interactive Multimedia and Artificial Intelligence*, 4(6), 103. <https://doi.org/10.9781/ijimai.2017.09.001>
- Schrepp, M., Hinderks, A., & Thomaschewski, J. (2014). Applying the user experience questionnaire (UEQ) in different evaluation scenarios. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 8517 LNCS(PART 1), 383–392. https://doi.org/10.1007/978-3-319-07668-3_37
- Scott, J. E. (2005). Post-Implementation usability of erp training manuals: The user's perspective. *Information Systems Management*, 22(2), 67–77. <https://doi.org/10.1201/1078/45099.22.2.20050301/87279.8>
- Sharma, Y., & Chowdhury, A. (2021). Evaluation and Redesign of SAP Portal for University Students. In *Smart Innovation, Systems and Technologies* (Bd. 221). Springer Singapore. https://doi.org/10.1007/978-981-16-0041-8_35
- Soellner, S. (2021). Digital elements for SAP ERP education and training results from a systematic literature review. *International Journal of Engineering Pedagogy*, 11(44), 115–128. <https://doi.org/10.3991/IJEP.V11I4.21843>
- Statista. (2022). *Enterprise-Resource-Planning-Software - Weltweit | Statista Marktprognose*. <https://de.statista.com/outlook/tmo/software/unternehmenssoftware/enterprise-resource-planning-software/weltweit>
- Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers and Education*, 50(4), 1183–1202. <https://doi.org/10.1016/j.compedu.2006.11.007>
- Tella, A. (2019). The determinants of library and information science undergraduate students' first impression of university library websites. *Education and Information Technologies*, 24(1), 277–294. <https://doi.org/10.1007/s10639-018-9769-4>
- Thielsch, M. T., Blotenberg, I., & Jaron, R. (2014). User evaluation of websites: From first impression to recommendation. *Interacting with Computers*, 26(1), 89–102. <https://doi.org/10.1093/iwc/iwt033>
- Tractinsky, N. (2004). *TOWARD THE STUDY OF AESTHETICS IN INFORMATION TECHNOLOGY*.
- Tractinsky, N., Cokhavi, A., Kirschenbaum, M., & Sharfi, T. (2006). Evaluating the consistency of immediate aesthetic perceptions of web pages. *International Journal of Human Computer Studies*, 64(11), 1071–1083. <https://doi.org/10.1016/j.ijhcs.2006.06.009>
- Tuch, A. N., Presslauer, E. E., Stöcklin, M., Opwis, K., & Bargas-Avila, J. A. (2012). The role of visual complexity and prototypicality regarding first impression of websites: Working towards understanding aesthetic judgments. *International Journal of Human Computer Studies*, 70(11), 794–811. <https://doi.org/10.1016/j.ijhcs.2012.06.003>
- Umble, E. J., Haft, R. R., & Umble, M. M. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research*, 146(2), 241–257. [https://doi.org/10.1016/S0377-2217\(02\)00547-7](https://doi.org/10.1016/S0377-2217(02)00547-7)
- Weiss, B., Wechsung, I., Hillmann, S., & Möller, S. (2017). Multimodal HCI: exploratory studies on effects of first impression and single modality ratings in retrospective evaluation. *Journal on Multimodal User Interfaces*, 11(2), 115–131. <https://doi.org/10.1007/s12193-016-0233-8>
- Ye, X., Peng, X., Wang, X., & Teo, H. H. (2020). Developing and testing a theoretical path model of web page impression formation and its consequence. *Information Systems Research*, 31(3), 929–949. <https://doi.org/10.1287/ISRE.2020.0924>