

A B2C Bias for the B2B World: A Case Study of Employees' and Customers' UX of a B2B e-commerce Site

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ABSTRACT

In our evaluation of the B2B e-commerce site of a global manufacturing company we conducted a user test with employees and customers. We found statistically significant differences in usability, user experience and NPS metrics between employees and customers, with the employees being more critical compared to the customers. We postulate and present some evidence that this difference is due to employees implicitly comparing B2B with B2C e-commerce sites and therefore expecting the experience of a B2C site for a B2B site. Such a comparison, fosters a bias, which has implications for businesses that host B2B e-commerce sites. We conclude by sketching recommendations for practitioners on how to go about such a bias.

CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); HCI design and evaluation methods; User studies.

KEYWORDS

UX, Usability, NPS, B2B e-commerce, differences between user types, Employees, Coworkers, Customers, Pulp and paper industry

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1 INTRODUCTION

One of the immediate and perhaps long-lasting implications of the Corona virus pandemic has been the increase in the use of e-commerce solutions for businesses. Although the broader public is probably more familiar with B2C e-commerce sites, the B2B, i.e., business-to-business e-commerce is many times larger [28]. Evaluating a site's usability and user experience (UX) is of utmost importance to its continuous improvement.

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The case of a B2B e-commerce site is a particular one, as employees, such as sales representatives are also regular users of the site itself. For example, employees, in the case of our colleagues, have their own, individual login credentials and regularly log in to check and communicate information to customers who do not have, or do not want to check the site themselves. Such information indicatively includes stocked products, production runs and samples.

In our effort to investigate the user experience of the B2B e-commerce site of Sappi, a global paper manufacturing company, we conducted a user test with 15 employees, colleagues of ours, and 14 customers. When comparing the usability, user experience (UX) and Net Promoter Scores (NPS) between employees and customers we found out a surprising difference. Our results showed that employees were more critical, when compared to customers, in all mentioned variables. In an effort to understand the reasons behind this difference, we discovered an implicit bias, which we report in this paper. We discuss the implications of this bias on the usage of B2B e-commerce sites. We expect that our case study will interest companies and practitioners, particularly ones that run their own B2B e-commerce sites.

2 RELATED WORK

2.1 Usability evaluation methods and UX

Usability is arguably one of the most important aspects of the quality of a user interface. Usability is a complex construct, which, according to the classical definition provided by the ISO 9241 [12], aims at supporting the development of interfaces that are effective, efficient and satisfying to use. In recent years, the more expanded concept of user experience (or UX) is being used to include also emotional factors [16]. The most direct way to measure usability and UX is through standardized questionnaires [16] that provide retrospective ratings of a user's experience. One of the most widely used standardized questionnaires is the System Usability Scale (SUS) [4, 15]. SUS, a 10-item scale that yields a single score, is considered a reliable and valid measure of perceived usability, even when translated in other languages [15, 16]. Similarly, for measuring UX, the User Experience Questionnaire (UEQ) offers a fairly comprehensive impression of UX [25, 26]. UEQ-S, a shorter version of the UEQ questionnaire [26], comprised of 8 items, has been specifically designed to be used along other questionnaires. The UEQ-S yields three scores, pragmatic (goal-directed) quality, hedonic (not goal-directed) quality, and an overall user experience score. Specifically

designed for market research, a customer feedback metric is the Net Promoter Score (NPS) [22, 32], which is used as an indicator of customer loyalty and growth potential by asking a single question concerning the willingness to recommend the firm in the future. Although NPS is facing critique among academics, it is nevertheless popular among managers [1].

Complementary to standardized scores, a variety of methods can help identify issues and areas of improvement in human interaction with an interface. Among them, a widespread method of user testing is the concurrent think aloud protocol (TA) [9, 16, 20], where users are asked to think aloud while performing test tasks [23]. The think aloud protocol is considered a productive method for problem discovery [20] that captures the user's immediate experience, although it might be difficult to generalize findings outside the TA tasks [16].

Generally, recruiting employees for user testing is not recommended, unless it is an application that is developed for them [17]. Furthermore, prior research leveraged user testing to compare employees and non-employees when it comes to aspects of usability and has found differences between the two groups [19]. In that study, employees were more critical in terms of the usability of competitors' products, which included websites and apps, compared to non-employees. However, both groups "*rated the company's own products similarly*", which means that usability practitioners could recruit their coworkers (i.e., employees) instead of participants recruited from the general population [19]. Usability in that study was measured with the SUS and SEQ [24] scales. However, it is important to mention that the "non-employees" were recruited through Craigslist, an American classified advertisements website. Locascio et al. [19] conclude by attributing the difference they found to employee brand loyalty, namely a bias towards their company when asked to rate competitors' products. The study we present in this paper is different in that it compares employees with customers of an e-commerce site of a company that they both know and use.

2.2 Usability of B2B e-commerce sites

The overall B2B e-commerce market is enormous. Credible reports estimate its value to be above \$10 trillion, and it is many times larger in value compared to B2C e-commerce [28]. Examples of B2B e-commerce sites include Alibaba, Amazon Business (not to be confused with the Amazon.com B2C site), Walmart, and eBay. Moreover, during the Covid-19 pandemic, e-commerce in general is estimated to have grown even more due to global lockdowns [21, 30]. Before expanding on usability aspects, it is important to highlight that within the B2B e-commerce there are two distinct models: 1) the *direct* model and 2) the *marketplace* one [28]. In the *direct* model, companies have their own B2B e-commerce site, but in the *marketplace* one, companies sell their products in the same site with their competitors, with Amazon being the quintessential example of a *marketplace*. In this work we examined the usability and UX of a company using the direct model.

It is only natural that the usability of B2B e-commerce sites is important, since B2B e-commerce itself is of great importance. Usability in an e-commerce context is crucial to attract and retain customers [7]. However, prior usability research work has primarily focused on B2C e-commerce [13] and the B2B domain is

a less researched area when compared to B2C [31]. This focus is understandable, as B2C e-commerce sites are open to consumers, meaning that essentially anyone could subscribe to, and access the information displayed on B2C sites. However, in B2B systems and e-commerce sites, there are more formalities, as users are interacting with the e-commerce site as representatives of their respective companies. In many cases, registration is not automatic and users of B2B e-commerce sites must have a business relation already established with the company hosting the site. These characteristics lead to very different user experience in a B2B e-commerce context. Indicatively, B2B users are more concerned with security when compared to privacy [31]. When it comes to investigating usability in B2C e-commerce, researchers in the past have used quite common methods such as user testing, heuristic evaluation and usage log analysis [8].

3 METHOD

In this work, we followed a mixed-methods approach. More specifically, we conducted interviews, performed expert evaluation of the site's user interface, tested the site with users, analyzed the site's logs, and conducted an analysis of competitor and partner sites. The purpose of applying those different methods was to develop a holistic understanding of the site. However, given the scope of this article, in the remainder of this section, we will only focus on the user testing part.

3.1 Sappi's B2B e-commerce site

Before we describe the methods used, we will shortly present the company and the site itself. Sappi is a global company focused on providing dissolving pulp, paper pulp, paper-based and biorefinery solutions to its customers in over 150 countries. Sappi is headquartered in Johannesburg, South Africa, with over 12,700 employees and manufacturing operations on three continents and customers in more than 100 countries.

The first version of Sappi's e-commerce site was developed in 2000. The site's long history has led to extensive functionality. Apart from some functionality exclusive to the site itself (e.g., printing multiple documents at once, news & notifications, calculators and e-commerce help), the rest of the site has ERP¹-like functionality. Such functionality includes ordering Sappi products, tracking orders, printing documents, checking product availability and scheduled production, viewing financial information, submitting claims, and various calculators (e.g., calculating how many palletes are necessary when wanting to transport a certain order). This extensive functionality offers Sappi customers the ability to self-serve their needs.

3.2 User Testing

We conducted two rounds of user testing with different user groups: one with Sappi colleagues (N=15) who frequently use the site (we will refer to them as "employees" from now on) and one with Sappi's customers (N=14). Our users from the employees group were primarily sales and marketing colleagues. We covered all of the continents the company is present for both employees (5 Americans,

¹ ERP stands for Enterprise Resource Planning and refers to a type of software that accommodates the daily business needs and activities of an organization.

4 Germans, 2 Dutch, 2 South Africans, 1 Austrian, 1 Finish) and customers (3 South Africans, 3 Germans, 2 Americans, 2 French, 1 Belgian, 1 Spanish, 1 Egyptian and 1 Polish). Since the majority of our employee participants (12 out of 15) and customers (9 out of 14) regularly use the site, we started the user test by asking them to show us how they typically use it. We then asked them to complete specific tasks of similar character and observed how they went about doing those. In the case of the first-time users, we asked them to complete a series of tasks. One example of a task, was: “*You want to place a typical grade² you order at Sappi. Try to place that typical grade through the site, without actually submitting it. Please start with the site’s login page.*”

Before conducting the tasks, we asked participants to fill out a short pre-task questionnaire. In that questionnaire we asked them: 1) whether they had used the Sappi B2B e-commerce site before; 2) to rate the level of their experience with B2C e-commerce sites on a five-point scale (extremely experienced – extremely inexperienced); 3) to rate their experience with other B2B e-commerce sites on a five-point scale (extremely experienced – extremely inexperienced), and, finally, only for the 21 participants who had used the site before, 4) how likely they were to recommend the Sappi B2B e-commerce site to a friend or colleague (i.e. the Net Promoter Score [22]).

The user tests were conducted through Microsoft Teams and were screen-recorded. During our user tests with both employees and customers, we asked the participants to complete the tasks and to follow the think aloud protocol. All but three sessions were moderated by our team’s most experienced UX practitioner to ensure uniformity [2]. Because of the international composition of the customers group, two user tests were done in French and one in German, therefore these were moderated by French, and German-speaking members of the team under the supervision of an experienced briefer so as to eliminate effects that might arise due to the participants’ English language skills [5]. Each test session was voice- and screen-recorded and then each video was analyzed by annotating usability problems in Excel. For the employees group, each recording was annotated by a single researcher, and two researchers split the number of recordings. In the case of customers’ test, eight additional team members belonging to Sappi’s e-commerce research initiative, were recruited and trained as annotators, so that they would also have a first-hand experience of the issues the customers faced. In this case, annotations were performed either by one experienced annotator or by mixing experienced with novice annotators. Language and regional considerations were also taken into account: the three sessions in French and German were annotated by French- and German-speaking team members and recordings of American users by American team members.

After having conducted the tasks, we asked participants of both groups to fill out three questionnaires, administered through Microsoft Forms; the: 1) System Usability Scale (SUS) [3]; 2) short version of the User Experience Questionnaire (UEQ-S) [26]; 3) Net Promoter Score (NPS) [22]. All three of those are widely used in practice [1, 4, 25].

²Grade is an industry term, essentially meaning “product”.

4 RESULTS

4.1 Employees are more critical when compared to customers

Customers score markedly better than employees in the three measures used (Table 1). Employees evaluated the site’s usability as average (SUS(avg) = 71.3, SD=19.8), whereas customers evaluated the site’s usability as excellent (SUS(avg) = 88.9, SD=10.8). This means, for employees this e-commerce site ranks in the 64th percentile, and for customers in the 89th percentile [16]. Additionally, the difference between employees’ and customers’ SUS evaluation is statistically significant ($t(27)=2.93$, $p=0.0068$).

We observe an even bigger difference in the UEQ-S (Table 1) scores. More specifically, for UEQ-S, employees evaluated the site as “bad”, with an overall score of 0.475, i.e., in the range of the 25% worst results [11] whereas customers rated it as “excellent”, with the much higher score of 1.893, i.e., in the range of 10% best results. Additionally, the difference between employees’ and customers’ overall UEQ-S evaluation is statistically significant ($t(27)=3.71$, $p=0.00094$).

Finally, we observe a similar difference in the NPS scores. More specifically, for NPS, employees evaluated the site with an overall score of -6 whereas customers with a higher score of 79. Additionally, the difference between employees’ and customers’ NPS evaluation is statistically significant ($p<0.01$, Fisher’s exact test).

Concluding, we observe that for all three measures, employees score significantly less than customers, which means that employees are more critical of the site in its usability, pragmatic and hedonic qualities and net promoter score. The question which arises is why do we observe such differences?

4.2 User test findings

The analysis of the recorded sessions and the annotation of usability issues observed with the site yielded a total of 114 findings (i.e. usability issue) for the employees group and 150 findings for the customers group (Figure 1). Although there is some region-based adaptation of the site, i.e., some functionality in the site is slightly different between regions (e.g., Calculators and Product Availability are completely separate functions between regions) it is important to highlight that these findings are not necessarily unique. We kept duplicate findings, as those would allude to an issue that would be more frequently observed and therefore potentially more frequently encountered. Some portion of the larger total number of findings in the customers group could be attributed [10] to having more than one annotator per recording (Avg=2.14, SD=1.4), when compared to the employees’ recordings, each of which was examined by a single annotator.

4.3 Why are employees more critical when compared to customers?

A potential explanation for why the employees are more critical, namely that they are using different, more complex parts of the site, can be ruled out. During the user tests and when asking employees whether they were using a subset of the functionality of the site, that was not the case. Employees did more frequently use some of the site’s functionality (e.g., checking product availability, ordering samples and calculators) and used some of the site’s

Table 1: Detailed comparison of SUS, UEQ-S and NPS scores (averages) between employees and customers.

	SUS		UEQ-S		Net Promoter Score ^a
	Avg	Std	Avg	Std	
Employees	71.3	19.8	0.475 (1.150 pragmatic, 0.200 hedonic qlty)	1.148	-6 (4 promoters, 6 passives, 5 detractors)
Customers	88.9	10.8	1.893 (2.304 pragmatic, 1.482 hedonic qlty)	0.882	79 (11 promoters, 3 passives, 0 detractors)

^a The NPS score is measured on a scale of -100 to 100

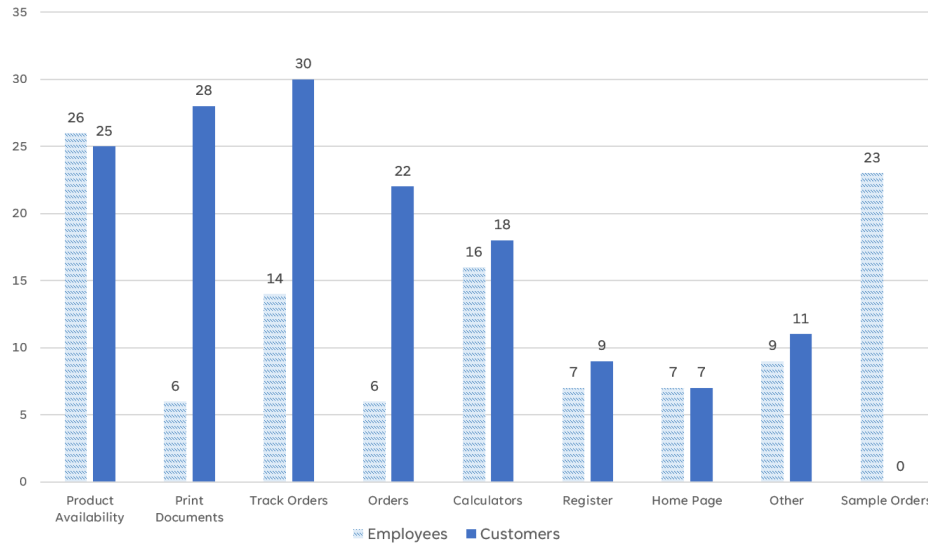


Figure 1: Comparison of findings between customers and employees from the respective user tests.

functionality less frequently (e.g., ordering products on behalf of a customer). Nevertheless, the employees that did frequently use the site did mention that they were aware of all the functionality of the site, even if they would infrequently use some of it. Furthermore, it should be highlighted that some functionality is exclusive to employees (e.g., ordering samples) and not available for customers.

As a follow-up investigation, we reached out again to the 15 employees and presented to them this difference. We emailed them Table 1 and asked them: “Why, in your opinion, are Sappi colleagues (on average) much more critical of the usability and generally the user experience of Sappi’s eCommerce site, when compared to Sappi’s customers?”. Before asking this question, we did make sure to explain all three measures and the results pointing out the observed differences. We did also offer more detailed explanations in case they wanted them. Five employees responded.

Based on these responses, it became clear that a reason that was repeatedly mentioned is that employees tend to compare the B2B site with B2C e-commerce, whereas customers will tend to compare with other B2B (i.e., procurement) sites. We present two indicative responses:

Employee 1: “One possible explanation could be if the customers interviewed were specifically procurement professionals with experience from other B2B e-commerce systems, and Sappi people were

comparing more with our personal experiences with B2C e-commerce systems which might be in general more developed and user friendly.”

Employee 2: “. . . Sappi colleagues could have the impression that our e-commerce platform could be better than it actually is – maybe even closer to the giants we use every week, amazon.com, bol.com, etc. . . . Our customers most likely have more comparisons/benchmarks, which most of the internal colleagues don’t have. At least not from the competition. This may explain why customers are quite happy with our e-commerce, especially if none of the (direct) alternatives seem to make a better appearance / usability.”

We can corroborate these opinions, with data we collected before the user test. In the pre-task questionnaire, we asked our participants, both employees and customers, to rate their experience with B2C and B2B e-commerce sites, in a five-point scale (Figure 2).

We indeed observe (Table 2) that employees (i.e., employees of the customer sales department) seem to be more experienced with B2C sites, whereas customers seem to be equally experienced with both B2C and B2B sites. When comparing the differences within the two groups we find that in the case of employees the difference is statistically significant (paired t-test for employees: $t(14)=4$, $p=0.0013$), whereas in the case of customers it is not (paired t-test for customers: $t(13)=1.14$, $p=0.27$). When comparing between employees’ and customers’ experience with B2C e-commerce sites,

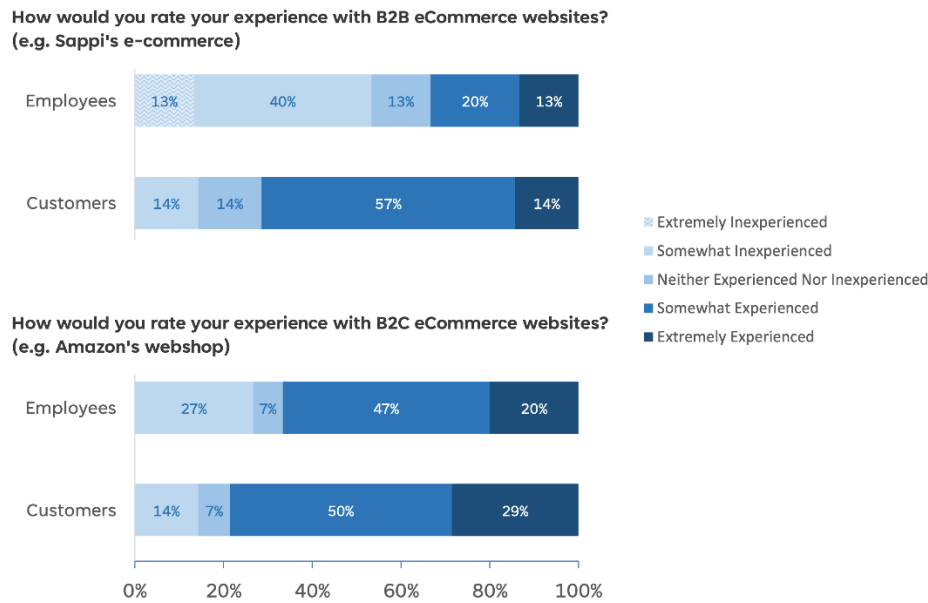


Figure 2: Responses to the questionnaire administered before the user test with employees. The responses confirm the impression that employees have more experience with B2C e-commerce sites than other B2B e-commerce sites.

Table 2: Responses to the questionnaire administered before the user testing.

	Experience with B2C e-commerce sites	Experience with B2B e-commerce sites
Sappi Employees	Avg=3.6, SD=1.12	Avg=2.8, SD=1.32
Sappi Customers	Avg=3.93, SD=0.99	Avg=3.71, SD=0.91

we do not find a statistically significant difference (unpaired t-test $t(27)=0.83, p=0.41$). Finally, when comparing between employees' and customers' experience with B2B e-commerce sites, we do find a statistically significant difference (unpaired t-test $t(27)=2.15, p=0.04$).

The previous analysis lends further support to the conjecture that employees are affected from their experiences of B2C e-commerce sites with B2B ones, whereas customers, who are also users of other B2B e-commerce sites (i.e., working in a procurement department of another company), are not affected from their experience of B2C e-commerce sites. In other words, there seems to be a bias exclusive to employees, a sort of implicit, unconscious comparison of the B2B e-commerce site with similar but then B2C e-commerce sites, a transfer of expectations from B2C e-commerce sites to B2B ones.

Other reasons that were mentioned were:

The B2B e-commerce site has less functionality compared to other internal systems, for example the company's ERP system. Finally, another reported reason is that employees might use the site less frequently when compared to customers. Two indicative responses:

Employee 5: "I guess the main reason for being more critical with the system is the fact that we as employees are aware of all information that is provided via <ERP system>. And the e-commerce site only shows a part of this information."

Employee 4: "From my perspective, the reason Sappi employees are critical of the usability is because we are trying to do more at once on the site than the customers. For example, when checking stock, you generally can only see one item on the screen at a time. Maybe if when searching for products it would be helpful if you could easily extract the information by being able to download it as an Excel document that can then be filtered?"

5 DISCUSSION

Locascio et al. [19] also found that employees were more critical in their usability score when compared to non-employees. However, in their research the critical scoring was towards competitors' sites. That is different to our case, in which we investigated the employees' own company site. Furthermore, in their study, the non-employee cohort was recruited through Craigslist - when that study was conducted that was a very common way to recruit general population participants in the Bay Area. In our case the non-employee cohort was a group of people who are already customers of Sappi, the company which has designed and hosts the e-commerce site.

Taking a broader perspective, one could look at the field of behavioral sciences, which study biases. We feel that a bias which seems related to our study is the *anchoring bias*. In their seminal work in the 1970's, Tversky and Kahneman showed that when people needed to make an estimation regarding a calculation, their

estimation was affected by a number that was shown to them just before they made that estimation [29]. This bias has been shown to impact many other aspects of life [18], varying from understanding other people [6], to decisions of economic nature [27].

We therefore posit that anchoring bias could explain why employees are more critical as compared to customers. It seems in our case, employees to have their B2C e-commerce experience as anchor and to expect a similar experience when using Sappi's B2B e-commerce site. Therefore, we assume that their experience with B2C e-commerce sites is superior compared to the one with the company's B2B site and that is why they score the site less favorably. Prior research documents that the UX of B2C sites is superior to B2B ones [14], thus our assumption of our colleagues' experience is most probably a safe one to make.

On the other hand, in the case of the customers group, they anchor their experience to other B2B procurement sites, with which they interact in the course of completing their daily tasks. Therefore, it would be not surprising that the customers group has a more favorable opinion of the Sappi B2B e-commerce site when compared to the employees group.

5.1 Recommendations for practitioners – implications for businesses

A possible implication of employees being more critical and transferring their expectations from B2C sites, is that they might not wholeheartedly promote the B2B e-commerce site. Their NPS score seems to be in-line with such an implication (Table 1). This implication is critical for the successful promotion of such an e-commerce site. If employees in the customer servicing department would not be willing to promote the site, then the word-of-mouth promotion of the site will be limited. Thus, a directly implication of our results, for other companies would be to measure the NPS score with their employees who are customer service representatives, or responsible for promoting the site. In case they find similar results with the ones we report in this paper, they would have to take action.

In our opinion, a first action would be to investigate and recognize such a bias. If it exists, then companies should make employees aware of such a bias. Companies should communicate their recognition that their employees are also consumers and users of B2C e-commerce sites. Furthermore, companies should highlight that comparing a B2C e-commerce site to a B2B site would not be entirely fair. The unfairness lies in that the case of a B2C e-commerce site, the company's sole purpose behind such a site is usually the site itself. However, in the case of a B2B e-commerce site, the company's main business is not the site itself – the site is another way of selling products and servicing customers.

On the other hand, companies who own B2B e-commerce websites should take into consideration this critical stance of employees and leverage it when designing user studies of their e-commerce solutions. In other words, a positive interpretation of our finding would be that the employees would have this rich experience from both worlds and therefore potentially have suggestions from their B2C experience on how to further improve the B2B site. Precisely those employees would therefore be a valuable source for designers to tap into.

Another, more practical and short-term suggestion we have heard from our colleagues is that naming the site *e-commerce* might not be right. According to our colleagues the overall name matters in the impression that it gives and they suggested that changing the naming of the site to something like *customer portal* would be clearer for them. Changing the name might also help in addressing the implicit comparison and bias we reported.

Finally, companies should make their employees aware of plans that they have to improve their B2B sites and make sure that they include employees in those. For example, employees could be included in the testing of early designs, in participating as observers in user tests with customers and when creating promotional material or tutorials for the site.

5.2 Future Work

This being one case study, we would encourage other companies especially in the manufacturing domain to report findings on such comparisons of their own B2B sites. We are also planning to reach out to customers to capture their opinions. Another potential direction for research is to what extent more broadly, consumer applications and not just e-commerce systems affect the use of enterprise ones (i.e., B2B systems). Furthermore, in future work we will be comparing the three metrics we used (SUS, UEQ & NPS) to examine potential correlations between those metrics.

6 CONCLUSION

In our effort to evaluate the B2B e-commerce site of Sappi, a global manufacturing company, we observed a significant difference on usability, UX and NPS metrics between employees and customers: employees were more critical across metrics. Further investigation with employees uncovered a potential unconscious employees' bias; namely employees unconsciously compare B2C, i.e., their personal experiences, when using B2C e-commerce sites with the company's B2B e-commerce site. That B2C bias raises implications for business that want to promote their B2B e-commerce sites. In this paper we layout some initial recommendations.

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