

THE DEVELOPMENT OF WEB-BASED PRODUCT CONFIGURATORS OVER THE LAST YEARS

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Abstract: 15 years after the initiation of the Configurator Database Research Project actually 1450 web-based product configurators could be identified in the internet. With the intend to give deeper insights into the various aspects of these web-based configurators different research foci have analyzed topics like product visualization types and device optimization over the last years.

This paper sums up some findings of the ongoing work since the initiation of the Configurator Database Project in 2007 and examines the status quo of the configurator landscape.

Key Words: Product Configurator, Configurator Development, Mass Customization, Industry Trends

1. INTRODUCTION

Web-based product configurators are software applications that enable a direct interaction between customers and companies online. They support users to design, create or put together their desired product by matching their needs with special components [1]. In 2007 the Configurator Database Project started with the aim to collect as many web-based configurators as possible online in order to monitor the development of configurators according to several categories and to give an insight into the status quo as well as trends [2]. Within the following years the collection of web-based product configurators has grown from some hundred entries to 1450 that are listed on the project's website www.configurator-database.com. Further during the last 10 years a printed Configurator Database Report has been published every year presenting the status quo of web-based configurators as well as the output of collected data to show patterns of growth or special trends concerning industries, product types or countries over the years.

1.1. Aim of this paper

Start-ups and companies that offer customized products should keep track of their competitors and follow up recent movements within the market. Knowing the status quo helps to identify opportunities and avoid barriers. For them it is crucial to follow technological and design developments in order to fulfill customers expectations and stay in business. The aim of this research is to sum up

findings based on the analyzed data of configurators listed in the Configurator Database within the last years and to have a look at the status quo of 2021/2022. The resume of the evaluated data may help companies, which are providing web-based configurators, in their decision making concerning planning further strategic steps.

1.2. Structure of the analysis

The first part of this article gives a brief insight into all the collected and crucial findings that were determined by means of a literature review and with a focus on the analyzed data of the Configurator Database Project. The second part of this paper compares the collected data of the Configurator Database Project from 2020 with that from 2021 to illustrate the status quo of the configurator landscape.

2. RESEARCH SETTINGS

First, a literature review of several papers and studies - using the data of the Configurator Database Project to evaluate different topics and trends - is used. The main emphasis of this part is to sum up interesting findings of web-based configurators to provide insights into various aspects like visualization or mobile optimization. The second part compares all web-based configurators of the Configurator Database Project of the years 2019/2020 with the years 2021/2022 and takes a closer look at the status quo of 2021/2022.

4. LITERATURE REVIEW

The Configurator Database Project is online available on www.configurator-database.com and clusters all listed configurators in 17 industries. Figure 1 depicts these 17 industries with a short description [3]. In the years 2017/2018 an increase of configurators in 10 of 17 industries was tracked compared to 2016 [4].

1 ACCESSORIES Everything that can be worn (except clothing and footwear) e.g. jewelry, bags, hats, belts, cases, glasses, watches, gloves	2 APPAREL All kinds of clothing & fabrics (except footwear) e.g. T-Shirts, pants, mixed clothing, underwear, socks, jackets, bikinis	3 BEAUTY & HEALTH Care products and cosmetics e.g. make up, lipsticks, shampoos, soaps, lotions, perfumes
6 FOOTWEAR Everything that is worn on the feet e.g. sneakers, flip flops, high heels, boots	5 FOOD & PACKAGING All kinds of food and beverages e.g. beers, wines, chocolates, cookies, candy, cereals, tea, coffee, snacks, labels	4 ELECTRONICS Electronic devices and applications e.g. computers, notebooks, usb sticks, cables
7 GAMES & MUSIC Everything for music and gaming e.g. musical instruments, boardgames, puzzles, playing cards	8 HOUSE & GARDEN All kinds of products for house and garden e.g. kitchens, garages, elevators, fences, furniture, doors, windows, saunas, tables, lamps, carpets, door knobs, light switches	
11 MOTOR VEHICLES Cars and other vehicles e.g. trucks, motor bikes, yachts, campers, trailers	10 KIDS & BABIES Products designed specifically for babies and children e.g. blankets, bottles, diapers, dolls, children's books, playgrounds, soft toys	9 INDUSTRIAL GOODS Different products mainly for manufacturers e.g. steel, chemistry, medicine, safety systems
12 OFFICE & MERCHANDISE All kinds of office supplies and merchandise e.g. folders, pens, business cards, stamps, pencils	13 PAPER & BOOKS Printed products and photo products e.g. books, cards, calendars, wallpaper, photo canvases, notebook, wrapping paper	14 PET SUPPLIES Products for pets e.g. pet food, pet accessories, aquariums, riding equipment
17 UNCATEGORIZED Products which do not fit in any other industry e.g. tissue boxes, swords, gemstones, signs, locks, coins	16 SPORTSWEAR & EQUIPMENT Equipment and clothes for sports e.g. skateboards, bicycles, snowboards, golf balls, diving suits, jerseys	15 PRINTING PLATFORMS Platforms which offer products of various industries e.g. giftware, photo products, 3D products, engraved products

Fig. 1. Industries of the Configurator Database [3]

Although *House & Garden* is the industry providing most configurators in the database, the product types that were offered most in 2017/2018 are *cars*, *T-shirts* and *shirts*, [4]. The reason for this may be that some companies do not offer just a single product but different product types. So products are aggregated into product groups like giftware or photo products [4].

A study carried out in 2021 evaluated the most popular web-based configurators listed in the Configurator Database based on the page views which each configurator page generated within one year. They identified 15 industries for these popular configurators, namely 35,1% in the industry *Motor Vehicles*, followed by 18,6% *Accessories* and 14,4% *Apparel* and *Footwear* each [5].

To sum this up the findings concerning the most popular industries from the study of 2021 [5] go hand in hand with the most offered product types in the configurator database namely *cars*, *T-shirts* and *shirts* [4]. In other words the industries covering most configurators are not necessarily the ones which offer the most popular product types. Furthermore the industries with the most occurring product types have been visited the most on the Configurator Database. Therefore the question occurs if these product types have been visited because they are popular and interesting for users or just because they are represented quantitatively most frequently.

Another interesting finding is that companies have started putting a focus on mobile optimization and have made their

web-based configurators mobile fit within the last years [4]. For example the study from 2021 found out that three quarters (75.3%) of the top 97 analyzed web-based configurators were responsive (device optimized) [5]. That may indicate that target groups are using smartphones to purchase configured products and that mobile usability is getting more important for companies.

Rogoll and Piller stated already in 2004 that product visualization is a key element of configurators regarding trust building and risk mitigation for users and a key factor for the willingness to purchase [6]. The study of 2021 evaluated that only 6 of the popular 96 web-based product configurators do not display the product at all. A photorealistic visualization is used by 79,4% of the configurators and only 14,4% show the product in an illustrative or schematic way. Most of the product visualizations, namely 73,2% depict the product in a flat, two dimensional image or combine multiple images based on the user's selection. Only 30,9% provide the visualization from only one perspective whereas 22,7% allow users to rotate the product 360° around at least one of its axis [5]. These outputs prove that visualization is an important element for companies and users within an online configuration process.

Nevertheless offering 3D visualizations on the one hand gives users a more intense experience, but on the other hand it is more complex to implement and may bring larger data sizes which can slow down configurator processes [5].

4. QUANTITATIVE ANALYSIS OF STATUS QUO

4.1. Development of web-based configurators

This chapter gives an overview of the development of configurators within the defined 17 industries from 2019/20 to 2021/22. Moreover it shows which industries registered a growth (added) or a loss (removed) of web-based configurators.

4.1.1. Ranking industries 2020 to 2021/2022

Figure 2 shows the number of listed configurators in 2019/20 compared to 2021/22 in each of the 17 industries. *Electronics* (+76%) as well as *Office & Merchandise* (+63%) are the industries with the highest growth from 2019/20 to 2021/22. Whereas *Food & Packaging* (-28%) and *Kids & Babies* (-26%) depict a decline from 2019/20 to 2021/22. As illustrated in Figure 2 more industries show a decline (9) than a growth (8) of configurators.

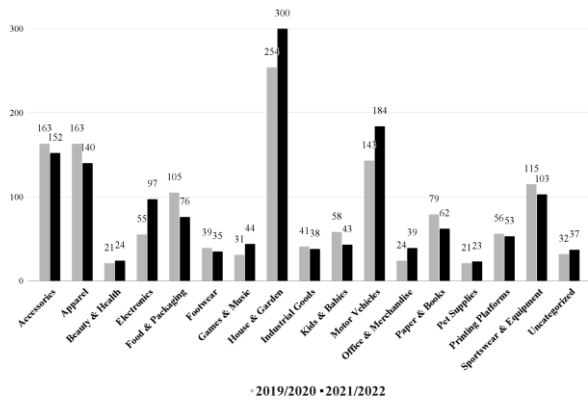


Fig. 2. Number of product configurators per industry in the Configurator Database in 2019/20 (n=1400) and in 2021/22 (n=1450)

4.1.2. Added configurators 2021/2022

The Configurator Database Report 2019/20 registers the amount of configurators which are added or removed within a year. The industry sector *Office & Merchandise* shows the biggest growth with 88%, followed by *Electronics* (84%) and *Games & Music* (68%). Figure 3 gives an overview of the growth rates of all 17 industries, whereas *Printing Platforms* is the industry with the least growth (2%) and *Paper & Books* with no growth (0%).

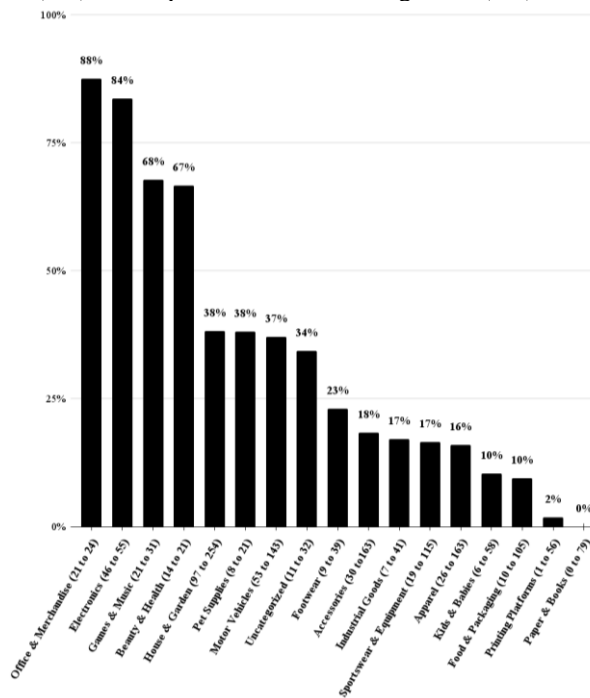


Fig 3. Added configurators 2021/22

4.1.3. Removed configurators 2021/22

Removed configurators are configurators that have been listed in the Configurator Database Report 2019/20, but are not available in 2021/22 any more. This may have various reasons which are not described in the report. However, *Beauty & Health* (52%), *Food & Packaging* (37%) and *Kids & Babies* (36%) are the industries with the most removed configurators.

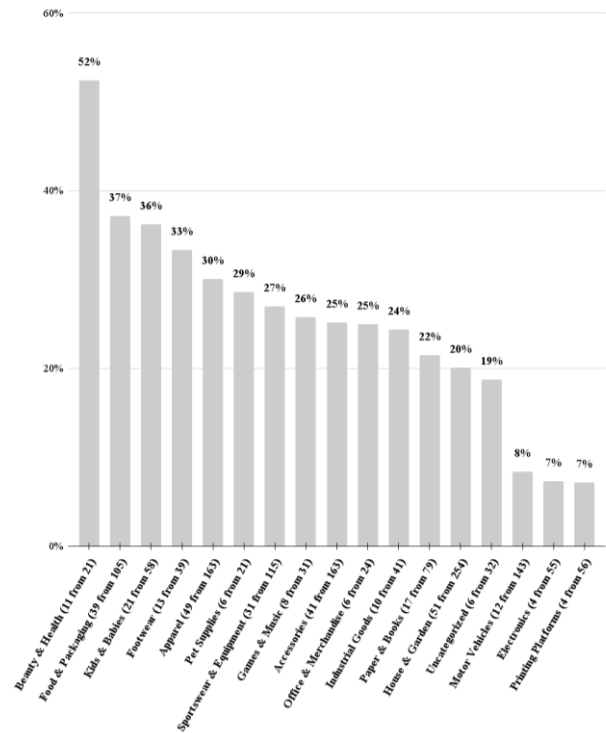


Fig. 4. Removed configurators 2021/22

4.2. Ranking of countries, industries and product types

The following part enables a deeper insight in the ranking of the top countries, industries and product types in 2021/22. It shall give a sense of which country, industry and product type is mainly used for customization purposes.

4.2.1. Ranking of top 5 countries in 2021/2022

Germany with 590 entries (41%) and the United States with 407 entries (28%) are the top two countries where companies, offering product configurators, are located.

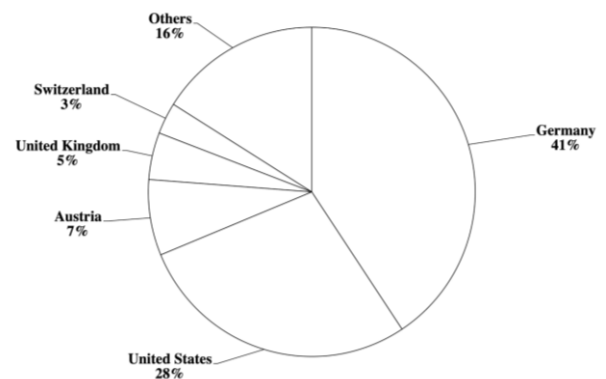


Fig. 5. Ranking countries (n=1450)

4.2.2. Ranking of top industries in 2021/2022

The industries covering most configurators are *House & Garden*, followed by *Motor Vehicles* and *Accessories*. Figure 6 depicts the ranking of all 17 industries and shows that *Beauty & Health* as well as *Pet Supplies* are the industries offering the fewest web-based configurators.

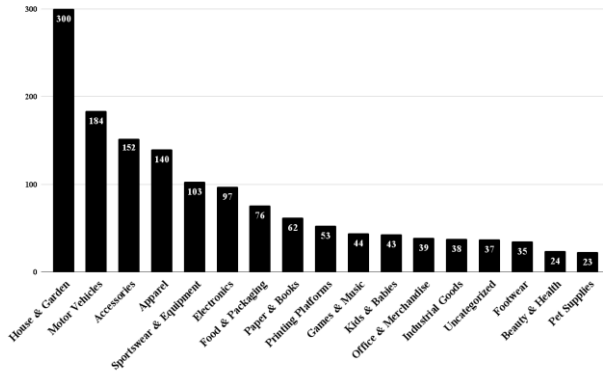


Fig. 6. Ranking industries 2021/2022 (n=1450)

4.2.3. Ranking of top 20 product types in 2021

Each industry cluster contains a number of products that are offered by the respective company. As illustrated in Figure 7 the analysis of particular product configurators detects that *car* is the product type that is found the most in the Configurator Database, while the industry *Motor Vehicles*, which it is part of, is also highly ranked in second place (see Fig. 6). Further top product types are *T-Shirts* and *PCs*.

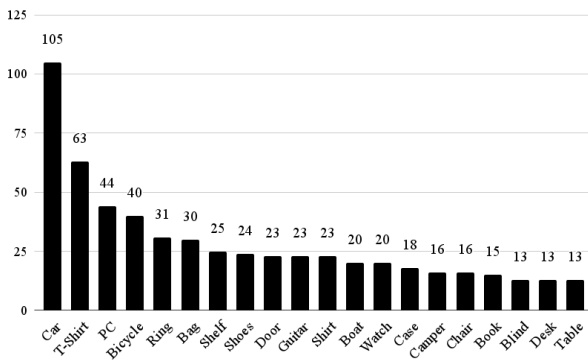


Fig. 7. Ranking product types (n=1450)

4.3. Device Optimized Configurators

The amount of device optimized configurators has highly increased from 2019/20 to 2021/22 which is depicted in Fig. 8. *Office & Merchandise*, *Beauty & Health* and *Accessories* are the industries with the biggest increase of device optimized configurators. The largest absolute increases of device optimized configurators by industry can be found in *Office & Merchandise* (50,6%-points), *Beauty & Health* (29,8%-points) and *Accessories* (29,5%-points). Regarding relative change we see an increase in *Games & Music* from 16,1% to 72,7% (+ 352%), in *Apparel* from 35,0 to 74,3 (+ 112%) and *Paper & Books* 36,7 to 67,7 (+ 84%). The industries with the smallest rate

of device optimized configurators in the 2021/22 period are *Industrial Goods* (55,3%), *Games & Music* and *House & Garden* both (72,7%).

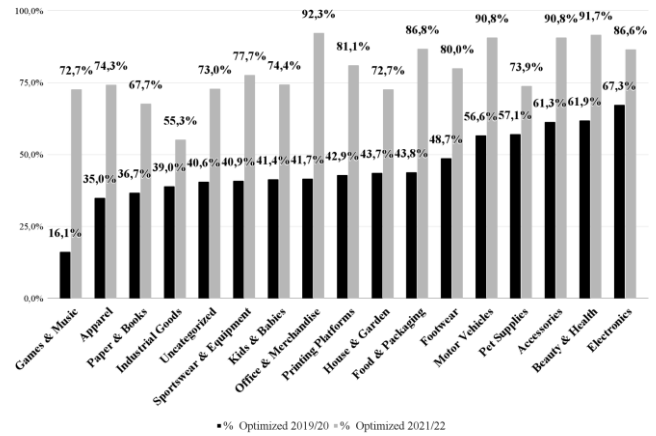


Fig. 8. Rate of device optimization by industry, comparison 2019/20 (n=1400) to 2021/22 (n=1450)

5. CONCLUSION

This paper sums up findings gathered from literature reviews with a focus of trends of analyzed web-based configurators. These findings show a positive development regarding mobile optimization of configurator interfaces, the importance of visualizations of the configured product as well as the deviation of the most popular product types in contrast to the industries that offer the highest amount of web-based products.

The evaluated data from the Configurator Database Project of 2021/2022 confirms the finding that mobile optimization of customizable products is becoming a standard as there is a high increase from 2019/20 to 2021/22. The product types *car*, *T-shirt*, *PC* and *bicycle* are listed the most in the Configurator Database even though *House & Garden* is the industry offering most configurators. Dynamics concerning removed and added configurators from 2019/20 to 2021/2022 show clearly that the field of mass customization is not steady and may entail fascination as well as challenges.

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