

Digitalization Think:Lab

Marketing Center Münster & Roland Berger Strategy Consultants

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GERMAN DIGITALIZATION CONSUMER REPORT 2014

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FOREWORD

Without most of us taking notice, our world has gradually been digitalized during the last 20 years. Digital products and services can be found in almost all areas of our life. We communicate via digital phones and cell phones, we watch digital TV, we read digital newspapers, we inform ourselves digitally using the Internet, we shop digitally, we document our lives with social media, we work digitally with computers ... it is hard to find a part of our lives that has not been affected by the digitalization revolution. Even more, our social welfare, our jobs, our social order, on the medium run, everything is dependent on technical progress and digital innovation (Castells 2010).

An extensive study by Hilbert & López (2011), published in Science, calculated the exact progress of digitalization. Already 2007, 94% of all world's knowledge (information) had been saved digitally, more than 99% of worldwide long-distance communication (two-way communication) took place digitally, and 25% of all TV- and radio-broadcasting (one-way communication) were digital. If considering the recent technological progress, one gets to an almost complete digitalization for these three key areas for 2014.

All of this has been reason enough for making "Digitalization" the main topic of this year's consumer report. Having the German Federal Government proclaiming 2014 the science year of the "Digitale Gesellschaft" (= "Digital Society") is just one more reason to do so (Bundesministerium für Bildung und Forschung 2014). With last year's report we already made an important step toward measuring digital change by quantifying the impact of social media on consumers. This year, however, we intend to examine the digitalization from a somewhat broader perspective.

With this report we take you on a digital adventure: Our first stop is digitalization of communication. Did you know that already more than one third of all we say or write is through digital means (p. 19)? Or that German consumers have increased their surfing time by about one hour within the last $1\frac{1}{2}$ years (p. 20)? Our second stop is digitalization of consumption. Currently, 41% of all consumption-relevant information is digital for us Germans. How this information is exactly made up of different sources, we explain in our Shopping-Information Doughnut Charts (p. 32). Furthermore, Germans love digital shopping. For some industries, consumers in our representative sample of Internet-users already bought 80% of their first-time purchases digitally! In this report we tell you which industries are most digital distribution-prone yet (p. 42). And besides, what's new? Is social media usage in Germany affected by the recent privacy turmoil (p. 24)? How do German consumers view new digital technologies (p. 45)? You will find answers to all these questions in this report.

In this spirit, we wish you an inspiring and adventurous journey!

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EXECUTIVE SUMMARY 1

This annual report aims at measuring the impact of digitalization on our society by analyzing two broad areas of societal transformation: the digitalization of communication and the digitalization of consumption. Our research is based on a representative German consumer sample of 1,924 participants. For the consumption part of this report we analyzed 3,782 real transactions in 19 product, service, and retail industries.

Digitalization of Communication

- A Thirty-seven percent of all daily communication in Germany is digital. German consumers use phones, instant messaging, the Internet and many other digital devices for everyday communication. The digital share of private communication is 37%. The digital share of business communication is 35%.
- Average daily Internet surfing time increased by one hour over the last 1½ years. Most of this increase is the result of mobile surfing, which has grown by 27%. Every fourth minute spent online is now mobile.
- A Digital word-of-mouth through electronic product reviews on websites and social network communication has become a powerful source of independent consumer information. For 39% of all initial purchases, digital word-of-mouth is equally or more important than traditional face-to-face recommendations. In several industries, digital word-of-mouth exerts a stronger influence on consumers' buying decisions than traditional word-of-mouth.
- We find that fewer people use more social media today than 1½ years ago. Four percent of German Internet users have canceled all of their social media accounts since our last report, resulting in 11.4% of German Internet users having no social media accounts. However, for people who do use social media, their usage increased by 7.4%.

Digitalization of Consumption

Digitalization of Purchasing Decisions

- \checkmark For the 19 different industries that we investigated in this report, 41% of all decision-relevant shopping information comes from digital sources (Internet, mobile devices, digital television, digital newspapers, digital radio, telephone, etc.). For travel, entertainment electronics, and public utility services, digital sources provide more than 60% of all purchase-relevant information.
- \checkmark Twenty-five percent of all decision-relevant shopping information comes from online sources (Internet and social media). Online shopping information is particularly valuable. It is considered important or very important for 28% of all purchases.
- \checkmark Online shopping behavior is shapeable. Whether people use online shopping information is influenced only slightly by their personal characteristics. Instead, the strongest factors influencing the use of online shopping information is the result of marketing-channel design and industry-specific informational needs.

Digitalization of Distribution

Voverall, German Internet users make 41% of their first-time product and service purchases digitally. Strong differences exist among industries – whereas 80% of travel-related purchases are made through digital channels, this is true for only 7% of grocery purchases. For travel, public utility services, communication services, entertainment electronics, and media products, approximately half of all initial purchases are made online.

Digitalization of Products and Services

- \checkmark Thirty-three percent of Germans consider upcoming digital technologies as relevant to their personal lives. In Germany, voice recognition and command and cloud computing and storage are the most widespread technologies in terms of actual application. Data glasses and augmented reality are perceived to be of low relevance.
- \checkmark When considering only those people who have heard of a particular future technology, augmented reality, same-day delivery, and life-logging devices for health care purposes are the most relevant. However, most people who have heard of data glasses still do not find this technology to be value enhancing because the associated utility is too abstract.

Interesting Facts



Only 34% of all daily communication is professional. 66% percent is private.

Gamers are desperately seeking augmented-reality devices. Almost 100% of gamers consider this technology personally relevant.



In Germany, Facebook, Instagram, and Jappy are the social media platforms with the highest usage intensities. 78%, 55%, and 51% of their users log in at least once per day.

Only 2% of first-time purchases are ordered via a smartphone or tablet computer.



of all first-time entertainment electronics purchases are made online.

Shopping information from online sources is currently 2.6 times more influential than shopping information from television. However, media spending on television is still 2.9 times higher than media spending on online marketing.



Employees surf the least (230 minutes daily), whereas unemployed people and executive employees surf the most (343 and 304 minutes daily, respectively).



Music streaming is on the rise. Spotify has grown 171% since 2012 and barely missed making the list of Germany's top-10 social platforms (Rank 11).

On average, every German consumer with Internet access owns 2.5 Internet-ready devices.

People using Wikipedia are 113% more active on social media than the average German consumer.



For 60% of all first-time grocery purchases, online recommendations from family and friends are more important than offline recommendations.



Health-care customers love their phones. No other German industry receives more orders by phone.



54% of all first-time purchases are still made in-store. 29% are ordered through a computer.

Dating communities are a paradise for women. 60% of the users are male











2 INTRODUCTION: OUR WORLD IS DIGITAL

Digitalization transforms our society like only the industrial revolution did before in recent history. The invention of the electronic semiconductor during the second half of the 20th century was the precursor to a continuous series of technical innovations. Those innovations first peaked at the turn of the century, with the broad distribution of the stationary Internet and corresponding dotcom developments. Today, we are on the verge of a second and even more fundamental digitalization peak through the sudden abundance of data and the broad availability of mobile Internet and connected mobile devices. Global digital storage has recently been estimated at 2.8 zettabytes (2.8×10^{21} bytes; a figure with 21 zeros) and is predicted to rise to 40 zettabytes by 2020 (Gantz and Reinsel 2012). Furthermore, during the last year, annual sales of smartphones for the first time exceeded one billion devices (IDC 2013).

The second peak of digitalization will cause very serious changes in consumer behavior, with ripples that can already be noticed and measured. This development has persuaded us to extend our previous focus on social media and make digitalization-related changes in consumer behavior the primary topic of this report.



Figure 1: The Three Streams of Digitalization.

Digitalization has unfolded its disruptive powers in three distinct streams: the digitalization of information and communication, the digitalization of distribution, and the digitalization of products (Figure 1). The digitalization of information relates to the digital storage and broad accessibility of knowledge and consumption-related information. Digital communication contains many types of digitally mediated exchanges of information. We define digital distribution as purchasing and delivery through digital technology. Finally, digital products and services are products and services that either contain digital technology or are themselves completely digital.

These three streams of digitalization constantly shape our personal and consumption-related environment and continuously cause a series of very fundamental changes that we call market disruption. Much has changed al-ready. For example, since 2010, the American stock index Standard & Poor's 500 with 13% has undergone more changes than ever before. The beneficiaries of this change include digital-affiliated companies such as Netflix, TripAdvisor, Nielsen, and the media and entertainment conglomerate 21st Century Fox. Companies that have been relegated to the sidelines are long-established media leaders, such as The New York Times and the Chicago Tribune, along with tradition-rich retailers, such as Sears Holding Corporation and RadioShack. Furthermore, in 2013, venture capital investments in Internet companies reached their highest level since 2001 (PwC 2014), resulting in innumerable, rapidly growing start-ups with innovative ideas, products, and services.

From the consumer's perspective, very little is known about how consumer behavior is about to change due to digitalization. We intend to change that situation by shedding light on two important facets of consumer behavior: changes in communication behavior and changes in consumption behavior.

In the next chapter, we summarize our research approach. One of our research choices was to increase our sample size by 1,000 survey participants to obtain more stable results, especially in smaller subsamples. Chapter four details changes in consumers' communication behavior, first from a global perspective and then with a special focus on changes in Internet and social media use. Chapter five broaches the issue of digitalization-related changes in consumption behavior. We begin by analyzing the impact of different information sources and media types on consumption decisions and continue by measuring the importance of different distribution channels. Finally, we briefly examine how digitalization affects products and services and investigate customer opinions about upcoming future technologies that have recently received a great deal of media attention. As in last year's report, the Appendix to this report provides detailed information on each of the 19 investigated industries. For each industry, there are Shopping-Information Doughnut Charts and information on the importance of each distribution channel.



THE METHOD: 3 **SURVEY DESIGN**

3.1 Data Collection

The German Digitalization Consumer Report 2014 is based on a representative online survey of German Internet users, who currently account for 76.5% of the German population (Initiative D21 and TNS Infratest 2013)¹. Representativeness refers to gender, age, education, and location within Germany (federal state); these attributes were used as quota criteria. Data collection took place in December 2013 with the help of a market-research service. The survey consisted of two parts. The first part referred to general media usage, especially Internet and social media usage. It was used to discover information on stationary and mobile Internet usage, consumers' business and private communication behavior, awareness of future technologies, and social media usage. In addition, the first part was used to calculate the Social Media Index, our social media measurement score introduced in last year's German Social Media Consumer Report. The second part of the survey collected personal information from each respondent about past consumption experiences related to two industries. Nineteen product, service, and retail industries were covered by the survey. The second part also provided information on the relevance of digital shopping information and digital distribution along with the information necessary to calculate the Shopping-Information Doughnut Charts for each industry.



Figure 2: Data Collection Statistics.

¹ Hereinafter, the terms "German Internet users", "German population", and "Germans" are used synonymously.

We collected 4,986 observations from 2,493 survey respondents (Figure 2). To improve the data quality, we used a conservative approach and excluded all observations for which the time to complete the questionnaire was below a previously defined critical threshold. We also excluded observations that contained systematic response patterns or implausible answers. Data cleansing did not affect the character of our data. The main results of this report do not change substantially when including all observations. The results reported herein are based on the final dataset of 3,782 observations.

Overall, survey respondents considered the questionnaire very comprehensible and easy to complete. They rated its ease of completion as 5.55 on a seven-point Likert scale (standard deviation: 1.54).

To remove any remaining discrepancies between the sample and the German population, we weighted each respondent to obtain an accurate portrayal of the German population. Because of the thorough data collection process, the weights were very small, ranging only from 0.85 to 1.17 (Figure 3; weights from our last report were very similar, ranging from 0.85 to 1.12). Thus, the weighting had a negligible impact on the results reported in this document.

Variable		Total # of Unweigh	ted Cases	German Population	Weights
Gender	Male	1859	49%	52%	1.06
_	Female	1914	51%	48%	0.95
Age	16-24	757	20%	21%	1.04
	25-34	589	16%	18%	1.13
	35-44	1021	27%	29%	1.06
	45-54	773	21%	19%	0.91
	55 or older	633	17%	14%	0.85
State	Baden-Württemberg	388	10%	10%	0.97
	Bayern	482	13%	13%	0.99
	Berlin	248	7%	7%	0.99
	Brandenburg	137	4%	4%	0.97
	Bremen	30	1%	1%	1.17
	Hamburg	107	3%	3%	1.10
	Hessen	285	8%	7%	0.96
	Mecklenburg-				
	Vorpommern	79	2%	2%	0.92
	Niedersachsen	305	8%	9%	1.09
	Nordrhein-Westfalen	904	24%	24%	1.01
	Rheinland-Pfalz	191	5%	5%	0.95
	Saarland	43	1%	1%	1.03
	Sachsen	221	6%	6%	1.02
	Sachsen-Anhalt	103	3%	3%	1.08
	Schleswig-Holstein	144	4%	4%	0.94
	Thüringen	106	3%	3%	1.00
Educatio	n "Hauptschul-"degree	1352	36%	35%	0.97
	"Realschul-"degree	1178	31%	32%	1.02
	"Abitur"	1243	33%	33%	1.01

Weights:

0.85 - 1.17

Figure 3: Sample Description and Comparison with German Population.

The questionnaire contains cross-sectional data from 19 different product, service, and retail industries (3,782 observations in total). The analyzed industries and the sizes of the respective subsamples are listed in Figure 4.

Inc	lustry	# of Observations	Industry	# of Observations
Pro	oduct Industries	1,816	Service Industries	1,634
1.	Automotive & Private		10. Banking & Insurance	206
	Transportation (bikes, motorcycles, etc.)	209	11. Small Businesses (barbers, craftsmen, bakeries, etc.)	193
2.	Hardware Store Products	204	12. Recreational Services (entertainment	
3.	Home Appliances	200	parks, cinemas, gyms, etc.)	207
4.	Groceries	194	13. Health Care	211
5.	Media Products (books, movies,	202	14. Communication Services	208
	music, games)		15. Travel (providers, airlines, hotels,	193
6.	Apparel	189	etc.)	100
7.	Sports Goods & Leisure Wear	200	16. Restaurants & Bars	198
8.	Entertainment Electronics	206	17. Public Utility Services	217
9.	Furniture & Home Decoration	211	Retail Industries	332
			18. Offline Retailing	152
			19. Online Retailing	180

Figure 4: Analyzed Industries and Sample Sizes.

3.2 Calculation of the Social Media Index - SMI

To measure social media usage by German consumers, we introduced the Social Media Index (SMI) in our 2012/2013 report. The SMI reflects the extent to which German consumers use social networks. It considers both a consumer's number of registered social media platforms and his/her frequency of visiting these platforms. In our questionnaire, consumers could choose from a list of the 66 most popular German social media platforms. To maintain the index's timeliness, we extended the original list of 47 networks from our 2012/2013 inquiry to add 19 new platforms (most of them mobile). As in our last report, we asked respondents how often they used each of their social networks, with answers ranging from "Several times per day" to "At least once per month." To calculate the SMI, we summed up the social network usage frequency for each consumer across all 66 social networks. For example, the SMI equals one if a person has registered with one social network, which he uses once a month. The value two can be obtained either by the weekly use of a single social network or by the monthly use of two social networks, and so forth. The theoretical maximum of the index is 264, which would be reached if a consumer used all 66 social media platforms several times a day, although such behavior is prevented by time limitations (Figure 5).



Figure 5: The Social Media Index Measurement Approach.



3.3 Calculation of the Shopping-Information-Doughnut Charts

One of the major objectives of our research is to shed further light on the impact of online information on consumer behavior, with a special focus on purchasing decisions. This objective implies the comparison of different types of digital information with other, more established information sources, including face-to-face communication, in-store information at the POS (point of sale), and advertising. To explain the perceived importance of all major information sources to purchasing decisions, we produced Shopping-Information Doughnut Charts.

To calculate these charts, each respondent was asked to name his/her most recent purchase for two out of the 19 industries covered by our survey. This approach was preferred over general assessments to create a more realistic consumption setting. For the last purchase, each respondent retrospectively rated the importance of different information sources on a seven-point Likert scale ranging from "Not important at all – 1" to "Very important – 7". For each survey participant, the importance of a specific information source was determined by dividing the source's rating by the sum of all sources' ratings to thus represent the information sources considered. All further calculations were performed using these relative shares, which ensured the equal importance of each respondent in our questionnaire. Furthermore, we restricted the answers to products/services that the consumer had not previously purchased (to rule out decisions that were based predominantly on habituation and were thus measurement artifacts)



Figure 6: Exemplary Shopping-Information Doughnut Chart. (*Question: How important were the following sources of information for your decision to buy XYZ?)

Please note that, for two reasons, no direct comparison between this year's and last year's results is possible. First, based on respondents' feedback on our last report, we made certain adjustments to the descriptions of several items. In particular, the area covered by the item "POS Information" was considerably broadened; it now covers all information coming directly from the POS (instead of only brochures and displays at the POS). Second, we decided to move the data collection closer to the subsequent year. Therefore, the data collection for this year's report took place during the pre-Christmas period of 2013, whereas the data in last year's report had been collected in July 2012. However, many consumers' consumption patterns change during the last months of the year. For example, the average sum of the assigned rating points decreased significantly for the 2014 inquiry (t(4803.94) = 4.06; p < 0.01), a result of the generally higher shopping volume and increased stress levels of consumers during the pre-Christmas season. For these reasons, we adjusted the average sum of the assigned

rating-points and report only the direction and rough magnitude of change from the previous year through "++", "+", "±", "-", and "--", instead of absolute point results. Please note that we do not report any change-related information for the POS because of the empirical redefinition of this information source.



4 DIGITALIZATION OF COMMUNICATION

4.1 Overall Communication Behavior

We live in a digitalized world. Our dependence on digital technology becomes particularly clear when we look at consumers' communication behavior (cf. Figure 1). On average, 37% of our daily communication is already digital. We use phones, cellular phones, instant messaging, the Internet and many other digital devices for our everyday communication. In other words, approximately every third word we speak to our families, friends, and workmates during the day is articulated through digital devices! Interestingly, there is no major difference between the digital share of private versus business conversations (Figure 7): the digital share of private conversations (which capture two-thirds of consumers' communication budgets) is 37%, whereas the digital share of business conversations (which capture the remaining one-third) is 35%.



Figure 7: Share of Total Daily Communication Volume Comprising Digital Communication.

When looking at different means of communication, the telephone and the cellular phone are still the most important communication media (Figure 8). Almost half of German Internet users (47%) use them every single day for private conversations. The wide distribution of smartphones and inexpensive instant messaging tools such as WhatsApp also led to a strong increase (+61% vs. 2012/2013) in the use of instant messaging. Thirty-nine percent of Germans use instant messaging on a daily basis.

4.2 Internet Usage

Internet usage has grown significantly (t(4,875.16) = 21.95; p < 0.01) during the last 1¹/₂ years and is an integral part of consumers' lives (Figure 8). Only 1.4% of German Internet users surf less than one hour per day. The average consumer actively surfs the net for four hours and 35 minutes every day (standard deviation: 275.3). This finding is an impressive increase of approximately one hour over last year's report (median time spent online: 2-3 hours for 2012/2013 versus 3-4 hours for 2014). Internet usage has undergone a particularly large increase at the upper end of the scale. We found an increase of 106% in the group of people who were online for more than five hours per day. This group now constitutes the largest segment of German Internet users, with a 28.6% share.



Figure 8: Self-reported Surfing Time in Germany on an Average Day.

Is Internet usage different on weekdays than it is on the weekend? It is not - we find no significant difference between weekend and weekday surfing (t(3,780) = 0.73; n.s.; Figure 9).

However, there are significant differences in Internet usage among different professions. Figure 10 displays the average daily Internet time in minutes for different occupations. With an average surfing time of 230 minutes, employees surf the Internet significantly less than the next-largest group, laborers (t(808) = 2.83; p = 0.05). The unemployed consumers in our sample are the heaviest Internet users, closely followed by executive employees. Their daily surfing times average 343 and 304 minutes, respectively.

Weekday vs. Weekend Surfing



Figure 9: Weekday vs. Weekend Surfing of German Consumers.



Figure 10: Self-reported Internet Surfing Time by Profession.

As of October 2013, Germans owned 37.4 million smartphones (comScore 2013), which constitutes 59.8% of cell phone users (comScore 2014). The growing distribution of smartphones has fueled the mobile-surfing trend. Compared with last year, mobile Internet usage has increased by 27% (Figure 11). Today, 27% of Internet usage is through a mobile device. In other words, more than every fourth minute spent online is mobile.

Percentage of Mobile Access



Figure 11: Average Percentage of Mobile Surfing.

The increase in mobile surfing is in line with the trend towards having multiple devices to access the Internet. During the last $1\frac{1}{2}$ years, the number of Internet-ready devices has increased significantly (t(5,645.44) = 4.36; p < 0.01) to an average of 2.5 devices per consumer. Almost 80% of German consumers own more than one Internet-ready device. Thirty-six percent of consumers currently use two devices to access the Internet (Figure 12). However, the growing number of available technical devices that are capable of accessing the Internet (tablets, smart televisions, etc.) leads to more and more people using three or more devices - almost 43% of German Internet users already own three or more Internet-capable devices. When looking at current trends related to connected wearable devices, smart and connected home appliances, and connected cars, we expect this trend to continue, with even steeper growth rates in the near future.



Figure 12: Number of Devices Consumers Use to Access the Internet.

4.3 Social Media Usage

The Social Media Index (SMI), as a standardized measure of social media usage in Germany, reflects the width and depth of social media usage by considering both the number of enrolled social media platforms and the usage intensity of those networks (see chapter 3.2, p. 15 of this report). On average, the SMI increased slightly, but not significantly (t(5,330.80) = 0.62; n.s.), from 7.5 to 7.7 since our last inquiry $1\frac{1}{2}$ years ago (Figure 13). This small increase is equally distributed among different educational backgrounds. However, the distribution of social media usage among different age groups has changed: younger people (16-34 years) use significantly more social media, whereas the use of social media by older people (45-54 years) has decreased.



Figure 13: SMI of German Consumers According to Demographic Criteria.



Social Media Index for people with at least one account: Ø 2014 = 8.64 σ 2014 = 8.90 Ø 2012/2013 = 8.14 σ 2012/2013 = 8.76

Figure 14: Data Security Divide of the German Population

Figure 14 displays what we call the Data Security Divide among German social media users. During the last 11/2 years, the proportion of German Internet users with no social media account has increased by four percentage points, which equals approximately 2.1 million people. Our current survey suggests that 11.4% of Internet users now have no social media accounts (Figure 15). Most of these consumers are older. In our last report, 13.2% of individuals 45 or older had no social media account. With this report, the percentage has increased to 20.2%.

What are the reasons for this development? We speculate that it is a reaction to the debate on data security, particularly with respect to the latest revelations of large-scale surveillance by the National Security Agency of the United States. This debate has most likely provoked a reaction among specific segments of the German population who are concerned about privacy and data-security issues. This development is one of general concern because it causes people to abandon technologies that are very likely to have great influence on their future employability and participation in social life. Other studies have forecast an increase in global annual welfare from \$900 billion to \$1.3 trillion due to social technologies (Chui et al. 2012). An erosion of confidence in data security poses the question of whether this welfare potential can be unlocked and whether it will be equally distributed among all social strata.

On the other side of the divide, we observe a contrasting development. The intensity of social media usage has increased among individuals who are still engaged in social media activities (t(4,971.76) = 2.1; p = 0.04; Figure 14). The SMI for these people has increased from 8.1 to 8.6. Most of these individuals are younger, between 16 and 35 years of age. These people are experienced in dealing with digital devices and appear to have no difficulty extracting personal utility from networks and services based on collaboration and social intelligence. Because of these two opposing trends, Germany today has fewer people who utilize social media than it did $1\frac{1}{2}$ years ago, but those who do utilize it do so more intensely.



Figure 15: Distribution of Social Media Accounts Among German Internet Users.

Strong dynamics since our last report can also be found when analyzing social media from a platform-focused perspective. Figure 16 shows our ranking of the 15 most important German social media platforms. The first two platforms' rankings have not changed - Facebook is still the unchallenged number-one social media platform in Germany and will most likely hold that position for a long time. An impressive 71% of German Internet users have a Facebook account. Even more impressive, 78% of them log in every day, which is another increase of 1.6% from 2012/2013.

The second-most important platform is the Google-owned YouTube network, where 39% of German Internet users have an account. One of the surprises of our inquiry is Google+. Although long criticized by the press and the Internet community, this network showed the largest growth in absolute users over the last $1\frac{1}{2}$ years. Google+ grew 25%, gained two ranking positions, and is now Germany's third-largest social media platform. However, this growth negatively affected usage intensity. Frequency in terms of daily usage went down for Google+ by 15%, but is still at a relatively high level at 42% daily usage. Overall, only four networks have higher daily access-rates than Google+: Facebook, Instagram, Jappy, and YouTube. For the first three, more than half of their users log in daily.

	Social Media	Percentag	ge of German In	Of These Percentage of Users Who Log In At Least Once a Day		
	Flationins	2014	Change vs. 2012/2013	Rank Change vs. 2012/2013	2014	Change vs. 2012/2013
1	Facebook	71.0%	-1.4%	±0	78.3%	1.6%
2	YouTube	39.2%	1.6%	±0	43.1%	3.7%
3	Google+	24.0%	25.2%	+2	42.3%	-15.1%
4	StayFriends	15.7%	-23.1%	-1	11.0%	-17.0%
5	Wikipedia	15.0%	n.a.	n.a.	40.0%	n.a.
6	Wer-kennt-wen	12.6%	-34.8%	-2	15.8%	-52.7%
7	Twitter	11.5%	9.1%	+1	38.9%	-13.8%
8	Xing	9.2%	-19.6%	-1	18.2%	-22.4%
9	MyVideo	8.4%	-11.5%	±0	25.9%	-0.1%
10	Instagram	6.7%	n.a.	n.a.	54.9%	n.a.
11	Spotify	6.5%	171.4%	+11	33.1%	-33.3%
12	Clipfish	5.5%	16.9%	+2	25.9%	-34.1%
13	Јарру	5.1%	-20.1%	-2	50.7%	0.0%
14	VZ-Netzwerke	4.9%	-58.1%	-8	28.3%	-4.8%
15	Picasa	4.3%	-23.3%	-3	22.4%	20.6%

SOCIAL MEDIA **TOP 15**

Figure 16: Distribution of Social Media Accounts Among German Internet Users.

Twitter also rose one ranking position, with 12% of German Internet users having an account and using it regularly. Figure 17 shows that Twitter has become particularly popular with younger user segments. The same result is true for Google+ and Xing, which compensated for the losses in the population of Internet users 45 years of age and older.

Another major development is the music streaming service Spotify. Since our last report, the Sweden-based company performed a noteworthy sprint, grew 171% and gained eleven ranking positions. It fell just short of entering the top ten German social media platforms (Figure 17).

The rise of international networks has resulted in strong negative consequences for most social media platforms of German origin. StayFriends, Wer-kennt-wen, Jappy, the VZ-Netzwerke, and Xing lost 20% to 58% in distribution and up to eight ranking positions on our list.

When looking at the full rankings of German social networks, three types of platforms are of interest: video, picture, and sound communities (Figure 18). As mobile Internet usage increases, the market opens to new platforms. Vine (rank 47), which features a six-second restriction on posted videos, is a good example of a video platform that perfectly fits current mobile usage behavior and data volume restrictions. People access the network while on the move and usually do not have enough time to watch several minute-long videos, which are also very data consuming. However, six seconds is a near-perfect length to consume while on the move. Perhaps this restriction is why the year-old start-up Vine, although still very small in terms of absolute users, is already ranked as the second-highest German video platform in terms of usage intensity (Figure 18). Moreover, Vine's user loyalty is also impressive, with 37% of its users visiting on a daily basis.



Figure 17: Relative Age Distribution Among Selected German Social Media Platforms.

	Vic	leo			Pic	ture		Sound			
Platform	% of Ge	erman Interne	et Users*	Platform	% of G	erman Interne	et Users*	Platform	% of G	erman Interne	et Users*
Flation	2014	Change vs. 2012/2013	Usage Intensity**		2014	Change vs. 2012/2013	Usage Intensity**	Flationin	2014	Change vs. 2012/2013	Usage Intensity**
YouTube	39.2%	2%	43.1%	Instagram	6.7%	n.a.	54.9%	Spotify	6.5%	171%	33.1%
MyVideo	8.4%	-12%	25.9%	Picasa	4.3%	-23%	22.4%	Sound-	2.6%		26.2%
Clipfish	5.5%	17%	25.9%	Flickr	2.1%	-23%	24.6%	last fm	2.070	200/	16 10/
Vimeo	1.9%	n.a.	25.7%	Pinterest	1.5%	151%		IdSL.IIII	2.3%	-30%	10.1%
Daily-				Photo-				Simty	0.5%	-68%	50.0%
motion	1.6%	n.a.	21.5%	bucket	0.6%	n.a.	27.0%	MyJuke	0.3%	5%	39.5%
Vine	0.6%	n.a.									

Figure 18: Distribution of Media Networks Among German Internet Users.

The strong trend towards mobile surfing also supports Facebook-owned Instagram (rank 10), which has become Germany's number one photo-sharing community (Figure 19). After Facebook, Instagram is the platform with the highest daily access rate, at 55%. In contrast, older and more traditional photo-sharing platforms such as Google's Picasa and Yahoo's Flickr had a difficult time. Both platforms lost almost 25% of their user base since our last report. Notwithstanding its hype at the time of our last report, Pinterest has failed to become the new all-star platform. Nevertheless, it gained 151% in highly active users and is currently at a 1.5% distribution among all German Internet users.

Flat-rate data plans and the option to listen to an individualized music stream for free have boosted on-demand online music consumption. In total, 9.7% of German Internet users are registered with a music-streaming service. This is a 44% increase over 2012/2013. In particular, platforms offering a great deal of freedom — such as a free choice of songs, a large assortment of songs, unique content, or low costs – showed strong growth. Thus, platforms such as last.fm or Simfy (which both offer limited customization elements) have come under pressure in Germany, whereas Spotify seems to have devoured the entire commercial music-streaming market (Figure 18), which constitutes another major challenge for the music industry because vendors such as iTunes have reported double-digit declines in paid music downloads (BillboardBiz BETA 2014).

What does a Spotify user look like? In our last report, we introduced profiles for six of the largest German social media networks, and these profiles have changed little since that report. However, because the sample for this year's report is considerably larger, we can now take a closer look at smaller platforms. Most Spotify users are quite young and have low incomes (Figure 19). Fifty-five percent of Spotify users are either pupils or university students, with students, who constitute 33% of users, comprising the largest share. Spotify's proportion of female users – 45% – is approximately average for social networks (48% of German social media users are women). Instagram has an even younger user base. The median age group for that platform is 16-25, and an impressive 70% of Instagram users are younger than 25 years of age. Forty-three percent of Instagram users are pupils.

		0		+
🌮 🛛 The Wikipe	dia User	The Dating Comm	unity Member	
Female Users	44%	Female Users	40%	Fe
Age*	36-45	Age*	36-45	Ag
Social Media Index	16.4	Social Media Index	19.8	Soc
Income*	1.000-1.999€	Income*	1.000-1.999€	Incor
Education*	"Realschul"- degree	Education*	"Realschul"- degree	Educati
Based	on 568 cases in sample.	Base	ed on 157 cases in sample.	
The Instagr	am User	The Spoti	fy User	F
Female Users	64%	Female Users	45%	Female
lge*	16-25	Age*	26-35	Age*
Social Media Index	19.3	Social Media Index	18.6	Social Me
ncome*	0-999€	Income*	0-999€	Income*
ducation*	"Abitur"	Education*	"Abitur"	Education
Bás	ed on 252 cases in sample.	Bas	ed on 247 cases in sample.	

Figure 19: Selected Social Media Profiles. (* = median)

Another group of much-discussed platforms are fitness apps, which use a smartphone's GPS tracking and motionsensor features to calculate various statistics related to one's personal fitness level. The Axel Spinger-owned Runtastic network is the most popular platform in this group. The average Runtastic user is highly educated, of average income, between 26 and 35 years old, and 2.6 times more active on social media than the average German Internet user. Figure 19 also shows average user profiles for Wikipedia users and members of dating and gaming communities.



5 DIGITALIZATION OF CONSUMPTION

The impact of digitalization on our society is not limited to communication but also affects consumption behaviors such as digital shopping information ("How do we consume consumption-relevant information? Which consumption-relevant information do we consume?"), digital distribution ("How do we purchase products and services?"), and digital products and services alternatives. These questions are essential to understand and measure how digitalization shapes our consumption behavior.

5.1 Digital Shopping Information

In this report, we distinguish between two types of information: digital and online. Whereas these two concepts are often used synonymously, they differ in terms of scope (Figure 20). Digital information encompasses all types of digital sources, which do not necessarily need to be related to the Internet. Digital information might also come from digital television (analog television broadcasting has been shut down within the last five years), digital cinemas, digital newspapers and magazines (the latter accessible via tablet computers, smartphones, email, or digital telephones), digital phones (Germany will terminate analog telephone service in 2018), and other digital sources such as digital billboards, vending machines, etc.



Figure 20: Digital vs. Online Information.

MARKET OVERVIEW

Information from digital sources accounts for 41% of all purchase-relevant information in Germany (Figure 21). In other words, two-fifths of all shopping information is received through digital media. On average, digital information is most important for choosing retailers (average 44%) and services (average 43%); for product purchases, it is only slightly less important (average 39%). Digital information is most important to consumer decisions regarding entertainment electronics, travel services, and public utility services. In these three industries, the share of digitally sourced information for making shopping decisions is more than 60%. In contrast, information from digital sources is of limited importance for groceries (14%) and services from small/local businesses (19%).

	Online Information
_	 Internet (Stationary & Mobile) Social Media



Figure 21: Digital vs. Online Information. (*Question: "Please estimate the amount of information from digital sources that you collected before you made the purchase." Respondents were provided with a list of digital sources.)

We also asked consumers from which specific sources and media types they received information and how important the different types of information were for making their purchases. The average distribution of purchaserelevant information among different information sources is shown in our Shopping-Information Doughnut Chart in Figure 22; please note that industry-specific analyses for each of the 19 analyzed industries can be found in the Appendix to this report.



Figure 22: Shopping-Information Doughnut Chart for Purchases in Germany. (*Symbols: (++) +10%, (+) +5%, (0) 0%, (-) -5%, (--) -10% vs. previous report; The category "POS Information" cannot be compared due to measurement changes.) Figure 22 reveals that consumers use three primary sources of information for making their purchasing decisions, all of which determine their decisions to a similar degree. These sources are:

(1) Stationary information "on site", namely POS information and personal salesmanship;
 (2) Online information collected on Internet sites or social media networks; and
 (3) "Offline" recommendations from family and friends.

Together, these information sources account for approximately of purchasing decisions. These results also illustrate the challenges faced by many German retailers. Because of their history, retailers are usually either strong in offline or online retailing, but very few cultivate both areas equally well. However, 59% of consumers use both online (2) and offline information ((1) and (3)) for making purchasing decisions, which we consider a valuable insight into the current debate on multi-channel retailing. Fifty-one percent of German Internet users both explicitly search for information online (2) and visit a store (1) before making a purchase. One implication of Figure 22 is that an efficient design and interplay between online and offline information channels can be considered an important success factors for retailing in Germany. For many products and services, it is insufficient to further improve either the online or offline channel alone because consumers look for solutions that help them extract maximum utility from a combined online and offline retail environment. The industries particularly affected by this combination are the automotive, communication services, public utility services, and entertainment electronics industries. For all four industries, more than 60% of consumers visit a store (1) and look for information online (2). In addition, the recreational services, banking and insurance, travel, home appliances, sporting goods and leisure wear, and furniture and home decoration industries strongly benefit from a harmonized offline and online retail experience. For these industries, more than 50% of consumers visit a store (1) and look for information online (2).

Figure 22 also shows that online information (i.e., from Internet and social media sources) now determines 24.7% of consumers' purchasing decisions, with 18.5% of information from the Internet comprising the large majority. Both Internet and social media information sources have demonstrated strong or very strong growth since our 2012/2013 report. What is special about online shopping information? Online sources provide particularly rich product and service information due to their great informational width and depth. Today, online sources cover not only the complete assortment of available products within a certain category (a phenomenon commonly referred to as the long tail of online shopping; Anderson 2004) but also very detailed information such as specifications, product testing, comparisons, user evaluations, etc.

In Figure 23, we examine the role of online information compared with important types of offline information at the individual-purchase level. We find that online shopping information is considered important or very important for 28% of all purchases. When looking at sub-groups of online information, the Internet is more important (24%) than information coming from social media (9%). In contrast, information coming from TV or print media is considerably less important for purchase decisions than information coming from the Internet with information coming from magazines and newspapers (9%) being at the level of social media and information from TV averaging at 6%.



Figure 23: Share of Purchases for Which Online Information is Important



Figure 24: Importance of Online Shopping Information Split into Internet and Social Media Information.

In Figure 24, we compare the importance of traditional Internet information and social media information across industries. The figure makes it clear that the importance of these two online sources is distributed in a highly heterogeneous pattern among industries; in other words, a high importance of Internet information does not necessarily accompany a high importance for social media or vice versa. For example, for the banking and insurance industry, Internet information (20.9%) is more than four times more influential than social media, whereas for recreational services, the Internet (14.0%) is less than twice as important as social media (7.5%). We assume that such differences among industries arise from their customers' different informational needs and different industries' provisioning of online information.

How does the importance of online shopping information develop over time? As seen in Figure 25, for approximately two-thirds of industries, both the Internet and social media have gained in importance since our last report. A strong decrease in importance was observed for social media alone and only in four industries – banking and insurance, online retailing, home appliances, and groceries. Overall, online information is becoming more important for most industries.



Figure 25: Change in the Importance of Online Information Since Last Report. (*Symbols: (++) +10%, (+) +5%, (0) 2%, (-) -5%, (--) -10% vs. previous report).

To shed even more light on the role of social media information in purchasing, we asked respondents a followup question to judge the relative importance of different social media sources: consumer reviews, recommendations from friends in social networks, and advertising in social networks. We find that the most important information within the area of social media is from consumer reviews (46%, which corresponds to a 2.9% share of purchasing decisions), followed by recommendations from direct social network friends (32%, or 2.0% of consumer decisions in general), and social media advertising (22%, which corresponds to a 1.4% overall share).

One of the most interesting trends caused by digitalization with respect to communication and information is the growing availability of word-of-mouth (WoM) information from other customers (cf. Hennig-Thurau et al. 2004). We find that comparing the roles of online and offline recommendations in purchasing decisions is a particularly interesting area of research. Specifically, we wanted to know how often online WoM was considered to be equally or more important than offline WoM. Figure 26 demonstrates that online recommendations are equally to or more important than offline recommendations for 39% of all initial purchases. For product purchases, online



recommendations are of almost equal importance to offline WoM, with online WoM being more informative for 48% of purchases. In service industries, online WoM is of somewhat less importance, and offline WoM dominates consumers' decisions.





Figure 26: Comparison Between the Importance of Online and Offline WoM by Industry.

What determines the importance of online WoM? Correlation analysis revealed that the relative influence of online WoM correlates positively with a product's involvement (r = 0.12; p < 0.01), purchase risk (r = 0.097; p < 0.01), decision complexity (r = 0.116; p < 0.01), consumer expertise (r = 0.036; p = 0.03), hedonic value (r = 0.080; p< 0.01), and functionality (r = 0.056; p < 0.01).

The most recent addition to the WoM landscape is information from other consumers made available through social networks such as Twitter and Facebook. Recently, scholarly research has provided evidence that microblogging WoM differs conceptually not only from offline WoM but also (to an even greater degree) from consumer reviews available on websites such as Amazon (online WoM; Hennig-Thurau, Wiertz, and Feldhaus 2014).

In the present study, we compared all three types of WoM - offline WoM (recommendations from family and friends), online WoM (from consumer reviews on shopping platforms), and microblogging WoM (recommendations from social media friends) - to determine their influence on consumers' purchasing decisions. The result is displayed in Figure 27. The gray number at the end of each bar describes the absolute importance of WoM in each industry (measured on a seven-point Likert scale with a theoretical maximum of 21). It is striking that the importance of recommendations varies strongly among industries. For some industries (recreational services and entertainment electronics), WoM is more than 30% more important than the overall industry average, whereas WoM is currently less than 50% as important as it is for other industries (groceries). In general, WoM is more

important for service industries than for product industries. The results for retail fall somewhere in between. The different types of WoM also vary strongly among industries. For example, offline WoM is of disproportionately high importance for restaurants and bars and for small businesses (i.e., they have relative WoM-shares larger than 60%). For entertainment electronics, public utility services, and online retailers, offline WoM is of disproportionately low importance. Instead, online WoM is extremely important for, e.g., home appliances, entertainment electronics, public utility services, and online retailers. What is most surprising is that microblogging WoM, on average, is only six percentage points less important than online WoM. For some industries, microblogging WoM is even more important than online WoM. Interestingly, many of these industries (restaurants and bars, small businesses, groceries, recreational services) also show high values for offline WoM. One reason for this finding might be that offline and microblogging WoM are very important in areas where sufficient structured recommendation approaches from online WoM are not yet in place.



Figure 27: Comparison of the Importance of Three Different Types of WoM for Purchasing Decisions.

Finally, returning to the topic of online shopping information in general, what can we say about its development over time? Figure 28 summarizes the changes in the importance of different shopping-information sources and industries. During the last 11/2 years, consumers have drastically changed their consumption-related information sources as the digital revolution has gained momentum. Online sources and high-quality offline channels (print and personal salesmanship) have gained influence, whereas mono-directional sources such as television, radio, public advertising and direct marketing have lost importance. The need for information also has shifted between industries-consumers' interest in grocery products-related information has decreased, whereas consumers' interest in information on entertainment electronics and recreational services has increased.

Change in importance of sec for purchase decision of sec	2L	Radio	Magazines & Newspapers	Social Media	Internet	Personal Selling	Direct Marketing Instruments	Recommen- dations from Friends & Family	Public Advertising
Total	4		+	+	+	+		0	
Product Industies	1	1	+	+	+	+			
Automotive	ł	I	0	‡	‡	+	I	+	
Hardware Store Products	ł	1	0		0	ŧ	I	ı	1
Home Appliances	ł	I	T	I	0	1	ł	1	I
Groceries	1	I	I	ł	1	ł	I	I	1
Media Products	ŧ	ŧ	0	+	4	+	ŧ	ŧ	+
Apparel	t	I	+	‡	+		I	+	
Sports Goods and Leisure Wear	1	1	+	+	+	ŧ	0	+	1
Entertainment Electronics	+	ŧ	‡	ŧ	‡		‡	+	ŧ
Furniture and Home Decoration	I	‡	+	+	E.	ŧ	I.	i.	ŧ
Service Industies	1	0	+	+	+	‡		0	+
Banking & Insurance	ł	I		J.	‡	‡	I		I
Small Businesses		1	‡			+	1	0	+
Recreational Services	ŧ	+	‡	ŧ	‡	+	+	+	‡
Health Care	I	ŧ	÷	ŧ	‡	ŧ	e.	5	
Communication Services	1	i.	‡	+	ŧ	ŧ			0
Travel	5	0	‡	ŧ	ŧ		+	ŧ	+
Restaurants	1	‡	0		‡	+	1	+	+
Public Utility Services	Ę	+	+	+	+	+	+	+	+
Retail Industies	ł	ł	0		+	Ĩ.			i.
Offline Retailing	t		‡	1	ŧ	0	•	1	
Online Retailing	I	1	1	1	1	1	0	0	1

Figure 28: Overview of Changes in the Importance of Information Sources for Purchasing Decisions.

Have the changes in the importance of consumption-related information sources also had an impact on advertising companies' allocation of media budgets? In our previous report, we called attention to the fact that media spending in Germany is not in any way coherent with the media's importance in purchasing decisions. This fact has changed little during the last 11/2 years. Figure 29 reveals that an imbalance still exists between the importance of an information source for purchasing decisions and the total marketing budget assigned to that source. Spending on online advertising is still low compared with advertising spending on television and print media. When compared directly, shopping information from online sources is 2.6 times more influential than shopping information from television. However, media spending on television is still 2.9 times higher than media spending for online marketing. It must be noted that directly triggering sales is not marketers' only advertising objective; building brand awareness and supporting a brand image are equally important goals that are not considered in this report. However, it is questionable whether this argument justifies the magnitude of the imbalance.



Figure 29: Media Importance for Purchasing Decisions vs. German Media Spending 2013. (*) Advertisement spending from Nielsen Media Research (2013) does not include agency and content production costs. ²⁾ Importance of information source for purchasing decisions.)

EXPLANATORY ANALYSIS OF FUNCTIONAL RELATIONSHIPS FOR THE USE OF ONLINE SHOPPING INFORMATION

Above, we discussed various aspects of consumption-related information in Germany and noted corresponding changes over time. In this part of the report, we now provide a deeper understanding of these observations by studying the functional relationships between the usage of online shopping information and its determinants.

Consumer involvement. Involvement describes how important a particular purchase is to a consumer and how strongly a consumer is cognitively and emotionally engaged with a purchase (Mittal 1995). Figure 30 displays the relationship between consumer involvement and the usage of (a) online shopping information and (b) the use of broadcast information, in this case from television. These functions show that the importance of both information sources increases with consumers' involvement. However, we find it striking that the slope in the online-

information diagram is substantially steeper than the television-advertising diagram. This difference indicates that the importance of online shopping information increases disproportionally with increasing involvement. For products with low consumer involvement, online information is 1.7 times more important than information from televisions. For products with high involvement, shopping information from online sources is 2.3 times more important than shopping information from broadcasting sources.



Figure 30: Importance of Online vs. TV Information Depending on Different Levels of Consumer Involvement. (r: Pearson Correlation Coefficient; *Significance level: p < 0.01; **Online information: Internet and social media information.)

Figure 31 displays the relationships among involvement and five further variables, namely purchase risk (a consumer's subjective evaluation of the likelihood of purchasing the wrong product), decision complexity (the difficulty of making a decision), consumer expertise (the level of expert knowledge a consumer has acquired for a specific product category), hedonism (products/services for which one of the major reasons for consumption is pleasure or fun), and utilitarianism (products that serve a clear and logical purpose), along with the consumer's usage of Internet information. The six determinants belong to the standard set of variables that marketing researchers commonly use to distinguish among different types of purchases. The figure shows that all six variables are positively linked to the use of online information for purchasing decisions: the more important the purchase, the higher the purchase risk, the more complex the decision, the more expert the consumer, the more fun the product is to use, or the more functional the product, the higher the use of online information for these purchases. Generally, these relationships are 1.4 times stronger for the Internet than for social media.



Figure 31: Correlation of Internet Information with Different Consumer and Product Characteristics. (r: Pearson Correlation Coefficient; *Significance level: p < 0.01)

We then integrated all of the variables into a joint model. We wanted to know which characteristics most strongly determine the usage of online information for consumption decisions. To answer this guestion, we first ran several stepwise regressions of usage intensity of online information for shopping decisions on each characteristic, other shopping information sources, and consumer characteristics. These statistical models explain whether and how the different groups of influential variables affect the amount of online shopping information a consumer seeks before making a purchase. In the final analysis, we ran a joint regression model that included all of the influential variables that were significant in the previous step.



Figure 32: Joint Regression Model on Usage of Online Shopping Information. (*Standardized coefficients | Stepwise regression model | Non-significant variables: automotive and private transportation, home appliances, apparel, sports goods and leisure wear, furniture and home decoration, banking and insurance, recreational services, health care, communication services, sex, age, urban environment, education, profession, daily communication units, number of Internet-ready devices, mobile surfing, number of social media accounts, lurking, past usage of future technologies, relevance of future technologies, TV, radio, newspapers and magazines, direct marketing, and public advertising.)

The final model explains 26% of the importance of online shopping information (Figure 32). Industry characteristics are approximately equally influential as marketing characteristics with respect to online shopping information. Personal characteristics are only approximately one-third as important as the other two groups. These results illustrate that the usage of online shopping information depends strongly on the current supply of online information. Some industries provide a greater amount of purchasing-relevant information online, whereas others disfavor consumer usage of online shopping information. In addition, the use of online shopping information depends on the relative quality of this information compared with other information sources. Finally, consumer characteristics have little to say about whether a person prefers online or offline information.

5.2 Digital Distribution

The second digital stream is digitalization of distribution. We consider a purchase digital if it is accomplished with the assistance of digital devices such as computers, mobile phones, tablet computers, telephones, or vending and transaction machines. As shown in Figure 33, 41% of all first-time purchases in our data are digital purchases. The figure also shows that services are ahead of products with respect to digital distribution; 46% of all initial service purchases are made digitally, whereas only 36% of first-time product purchases are made through digital distribution channels.



Figure 33: Digital Distribution in Germany.

(*Digital purchase channels: computer, cell phone, tablet computer, landline phone, transaction or vending machine; non-digital purchase categories: store, salesman, mail and fax.)

Inter-industry differences related to digital distribution are even stronger than they are in relation to the use of digital shopping information. For example, whereas 80% of all initial travel bookings involve digital purchases, only 7% of all first-time grocery purchases are digital. Overall, more than half of all initial purchases are made through digital channels for travel, public utility services, communication services, entertainment electronics, and media products. The Appendix provides more detailed information on the importance of the distribution channels for each of the 19 queried industries.

The largest share of digital purchases belongs to online purchases via stationary computers or mobile devices. Online purchases account for 33% of all initial purchases and approximately 80% of all initial digital purchases. Figure 34 shows how the distribution of products and services splits into different distribution channels. The vast majority of transactions are still conducted in-store – approximately 54% of all first-time product and service purchases. The second-most important distribution channel is stationary Internet. Twenty-nine percent of all first-time purchases are made via a computer. Mobile devices account for only 4.3% of all initial product and service orders, which is clearly less than their share of communication and information. Mobile shopping is responsible for just 13% of online purchases, whereas mobile surfing is responsible for 27% of total surfing time.







We assume that there are two reasons for this finding. First, mobile Internet is still quite new and many stores have not yet developed convenient and well-organized mobile shops. This reality is likely to change soon. Second, purchasing a product involves more risk than merely searching for information. We believe that many consumers do not trust mobile platforms as much as they trust stationary websites. We think that this is an important insight for marketers with respect to improving trustworthiness and, eventually, acceptance of mobile shopping platforms.

			53,5%
28,8%			
30.0%	40.0%	50.0%	6



Figure 35: Joint Logistic Regression Model for Consumers' Usage of Digital Distribution.

(*Odds ratio – Exp(B) | Logistic regression model| Non-significant variables: age – 45–54, age – 55 or older, furniture and home decoration, small businesses.)

With respect to digital information, we also ran several logistic regression models to find out more about what determines digital distribution. First, we analyzed the impact of industry characteristics, information sources, and personal consumer characteristics on digital distribution (buying in-store vs. buying online) in three separate models. In these models, the consumer's chosen information sources for the purchase had the strongest explanatory power (an increase in hit rate of 14.5 percentage points; hit rate of 73.6% vs. 59.1% for the base model) followed by the particular industry to which the purchase belonged (an increase in hit rate of 11.4 percentage points; hit rate of 70.5% vs. 59.1% for the base model). As in previous regression models, consumer characteristics again have very little – here, almost no – influence on whether a person chooses to purchase online (increase in hit rate of 0.8 percentage points; hit rate of 59.3% vs. 58.5% for the base model).

Next, we included all of the significant variables from these three models into one joint logistic regression model (Figure 35). This final model is able to estimate 77% of all cases correctly, which means that the model correctly assigns 77% of all of the cases in our sample to either the group of online or in-store buyers. The result can be interpreted as follows: If consumers search thoroughly for information online (Internet and social media), they are very likely to purchase online. Consumers that heavily consume POS information are more likely to buy offline. Those industries with a strong imbalance between online and offline purchases exert the strongest positive (travel, communication services, public utility services, media products, entertainment electronics) or negative (groceries, hardware store products, restaurants and bars, automotive) influence on the likelihood that a consumer will choose digital distribution.

5.3 Digital Products and Services – Future Technologies

The third stream of digitalization covers the digitalization of products and services themselves (cf. Figure 1). There are different ways to digitalize a product. One way is to add digital technology that enables the product to use digital information or to communicate with other technology. For example, the share of digital technology (by value) built into cars has risen from approximately 9% in 2003 to 30%–35% today (Chitkara and Ballhaus 2013). This share is forecasted to increase to as high as 50% by 2030. In other words, in a few years, half of the cost of car production will be attributable to digitalization is that the product itself is completely digitalized already, such as Wikipedia, an MP3 song, or a streamed movie. The media industry has most likely undergone the most radical changes due to digitalization. Studies estimate that digital products account for approximately 34% of total media sales (by value) worldwide and will rise to almost 40% by 2016 (Wilkofsky Gruen 2012). In Germany, 58% of initial media purchases (by volume) are made online, according to our data. Twenty-seven percent of media purchases (by volume) are completely virtual and consist of only the download of a file or the purchase of usage rights.

For digital products and services to be successful, consumer acceptance is *a conditio sine qua non*. To learn about consumers' acceptance of new digital technologies and features, we asked consumers about their attitudes towards eleven upcoming technologies that have been intensively discussed by industry and media experts: voice recognition and command, mobile payment, household robotics, 3D printing, cloud computing and storage, life-logging devices for fitness purposes, life-logging devices for health-care purposes, data glasses, intelligent apparel (also known as wearable computers), same-day delivery, and augmented reality. For each of these technologies, we asked whether consumers are aware of these technologies, whether they have already used them, and how relevant they consider these technologies to their personal lives. Figure 36 shows the results.



Figure 36: Consumer Perception of Near-Future Technologies.

Consumer Perception of Near Future Technologies

Except for same-day delivery, life-logging health-care devices, and augmented reality, more than 50% of consumers had previously heard of the remaining technologies (aided awareness). With respect to actual usage, four technologies stand out as having been used by more than 10% of consumers: voice recognition and command, cloud computing and storage, mobile payment, and life-logging fitness devices. Voice recognition has by far the highest distribution of these new technologies among German consumers – 48% have already tried this technology in the past, whereas only 29% of consumers have at least once used cloud computing and storage, and only 19% have tried mobile payment or life-logging devices for fitness purposes.

At the lower end, data glasses have been tried by fewer than 1% of German consumers. Given the strong hype and widespread awareness of this technology in the press and media, we find it surprising that data glasses received the second-lowest relevance score. These results indicate that the success of this technology depends on reducing its abstractness level and clarifying its benefits for consumers. We also suspect that several consumers are skeptical of the idea of constantly filming one's personal environment. Thus, there is still a great deal of consumer information and education for Google to provide before this technology is ready to launch.



Figure 37: Future Technology Hit List. (*R/A Index: Relevance/Awareness Index; technology relevance as evaluated only by those people who have heard of the technology.)

Evaluations of upcoming technologies by consumers who have not heard of those technologies might result in a distorted picture of their relevance. Accordingly, we created the Relevance/Awareness Index, which divides the relative relevance of a technology by its relative awareness. The result is displayed in the future technology hit list in Figure 37. When considering only people who have heard of a particular new technology, the ranking changes drastically. In this case, augmented reality, same-day delivery, and life-logging devices for health-care purposes are the most relevant innovations for consumers. Augmented reality in particular is an interesting phenomenon. Although only 14% of consumers have heard of this technology, virtually all of them consider it relevant. As we looked at our data more closely, we learned that these people are primarily gamers who appear to be waiting for this technology to enhance their gaming adventures.

What does a prototypical consumer who is aware of future technologies look like? To answer this question, we ran a regression with "Future Technology Awareness" as the dependent variable. Figure 38 displays the result of this model. Unlike previous regression models, consumer characteristics explain almost one-fifth (adapted $R^2 = 18\%$) of the variance in our data in this model.



Figure 38: Regression Model of Future Technology Awareness. (*Standardized coefficients | Stepwise regression model | Non-significant characteristics for this calculation: age, rural vs. urban habitation, mobile surfing, all other professions, Hauptschul-degree.)

We learn that consumers who are aware of future technologies have a higher level of education (either "Abitur" or "Realschul"-degree) and are more likely to be male than female. A significant share is composed of students. They are highly communicative (= total communication units), but prefer face-to-face over social media-bounded communication (= negative correlation with SMI). They make use of current technology (= number of Internet-ready devices) and are generally interested in new social media platforms (which they do not, however, use intensively). Furthermore, they spend a disproportionately small amount of time online and do not use their various social media accounts intensively.



6 CONCLUSION

For the last 20 years, digitalization has constantly shaped our environment. After the broad distribution of stationary Internet caused a first digitalization peak at the turn of the century, mobile Internet and the sudden ability to collect, store, and analyze a sheer abundance of new data are causing a second, even more fundamental digital societal change. This report highlights the two main areas of consumer behavior that have been the most strongly influenced by digitalization: communication and consumption. We provide evidence that there have been substantial changes in both of these areas in the recent past. In addition, this report sheds light on the digitalization of products and services as a third path (see Figure 39). Along these three streams, this report provides important insights into how digitalization affects our daily lives. Thirty-seven percent of our daily communication is already carried out via digital technology, with mobile Internet playing an important role. The broad distribution of smartphones has contributed to a one-hour increase in our average daily Internet surfing time over the last 1½ years.



Figure 39: The Three Streams of Digitalization.

In the area of consumption, digital information also plays an increasingly important role. Forty-one percent of all decision-relevant shopping information comes from digital sources. Online sources now provide 25% of all decision-relevant shopping information. In 44% of all cases, online sources even provide the most important piece of information.

The digitalization of distribution has also left its mark. On average, 41% of all initial purchases are made digitally. However, strong differences exist among industries. Whereas German Internet users book 80% of their first-time travels through digital channels, only 7% of initial grocery purchases are made digitally. Digital components play an increasingly important role in the provision of products and services. Germany is generally open to the inclusion of new digital technology in products and services. Thirty-three percent of Germans already consider upcoming digital technologies as relevant to their personal lives. However, our respondents did not consider all innovations equally important. Whereas voice recognition and command, mobile payment, household robotics, and cloud computing and storage are considered important by more than 40% of the German population, augmented reality, same-day delivery, and life-logging devices for health-care purposes are considered relevant by specific segments of the population.

What remains? Digitalization has begun to unfold its disruptive power over our communication and consumption behavior. We do not see any limit to this development; instead, the upcoming months and years will bring many changes for all of us along with fascinating new possibilities for both consumers and companies. We are excited to see what our society will look like next year, the year after that and in 2020. Digitalization, rock on!

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APPENDIX: 8 **INDUSTRY-SPECIFIC RESULTS**

The following pages provide industry-specific results for the importance of different information sources to purchasing decisions and industry-specific information on product and service distribution channels. Furthermore, this Appendix also contains an overview of moderators.

8.1 Industry-specific Determinants

Average Values (Likert Scale; Range 1-7)	Involvement	Perceived Purchase Risk	Decision Complexity	Expert Knowledge	Hedonism While Using Product	Functionality of Product
Total Average	3.65	1.91	2.23	2.72	3.92	4.01
Product Industries	3.64	2.19	2.37	2.80	4.23	4.21
1. Automotive & Private Transportation (bikes, motorcycles, etc.)	4.72	3.28	3.64	3.14	4.84	4.79
2. Hardware Store Products	3.34	2.08	1.98	2.80	3.54	4.35
3. Home Appliances	4.01	2.28	2.56	2.58	4.27	4.79
4. Groceries	2.39	1.39	1.68	2.52	3.33	3.04
5. Media Products (books, movies, music, games)	3.02	1.48	1.59	2.93	4.84	2.92
6. Apparel	3.20	1.68	2.03	2.37	3.55	3.54
7. Sports Goods & Leisure Wear	3.57	2.38	2.31	2.87	4.33	4.50
8. Entertainment Electronics	4.58	3.15	3.26	3.30	5.13	5.07
9. Furniture & Home Decoration	3.83	1.93	2.21	2.62	4.12	4.72
Service Industries	3.77	1.74	2.17	2.59	3.54	3.74
10. Banking & Insurance	3.96	1.65	2.59	2.56	2.89	3.65
11. Small Businesses (barbers, craftsmen, bakeries, etc.)	3.26	1.85	1.57	2.05	3.49	3.66
12. Recreational Services (entertainment parks, cinemas, gyms, etc.)	3.46	1.41	2.01	2.70	4.92	4.14
13. Health Care	4.24	2.02	2.43	2.77	2.87	3.71
14. Communication Services	4.38	1.92	2.73	3.23	3.61	3.95
15. Travel (providers, airlines, hotels, etc.)	3.50	1.47	1.74	2.56	3.47	3.72
16. Restaurants & Bars	2.75	1.35	1.38	2.20	4.36	3.51
17. Public Utility Services	4.50	2.19	2.75	2.56	2.74	3.60
Retail Industries	3.06	1.16	1.78	2.96	4.10	4.19
18. Offline Retailing	2.82	1.09	1.84	2.68	3.83	3.98
19. Online Retailing	3 26	1 23	1 73	3 20	4 33	4 38

8.2 Product Industries

OVERALL RESULTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 1,598



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.



TV

1,8%

	6	1,5%		
6				

40.0% 50.0% 60.0% 70.0% 80.0% 90.0% 100.0%

AUTOMOTIVE AND PRIVATE TRANSPORTATION (BICYCLES, MOTORCYCLES, ETC.) Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 196





Social Media - Advertising

Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

HARDWARE STORE PRODUCTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 167



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

					86,5%	
40,0%	50,0%	60,0%	70,0%	80,0%	90,0%	100,0%

HOME APPLIANCE INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 189





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

GROCERY INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 140



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be consider

					9	2,2%
40,0%	50,0%	60,0%	70,0%	80,0%	90,0%	100,0%
red caref	ully					

MEDIA INDUSTRY (BOOKS, MOVIES, MUSIC, GAMES, ETC.) Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 169





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

APPEREAL INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 159



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.



SPORT GOODS AND LEISURE WEAR PRODUCTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 187





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

ENTERTAINMENT ELECTRONICS INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 200



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

90,0% 100,0%

FURNITURE AND HOME DECORATION PRODUCTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 192



TV Radio Magazines & Newspapers Internet Personal Selling Direct Marketing Instruments Recommendations from Family & Friends Public Advertising POS Information Social Media - Consumer Reviews Social Media - Recommendations from Friends Social Media - Advertising

Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

8.3 Service Industries

OVERALL RESULTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 1,544





Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

- TV
- Radio
- Magazines & Newspapers
- Internet
- Personal Selling
- Direct Marketing Instruments
- Recommendations from Family & Friends
- Public Advertising
- POS Information
- Social Media Consumer Reviews
- Social Media Recommendations from Friends
- Social Media Advertising

60.0% 70.0% 80,0% 90,0% 100,0%

BANKING AND INSURANCE INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 200





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

SMALL BUSINESSES (BARBERS, CRAFTSMEN, BAKERIES, ETC.) Importance of Different Information Sources for Purchasing Decisions



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

72,4% 50,0% 80,0% 90,0% 100,0% 40,0% 60,0% 70,0%

RECREATIONAL SERVICES (ENTERTAINMENT PARKS, CINEMAS, GYMS, ETC.) Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 203





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

HEALTH CARE

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 188



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.



COMMUNICATION SERVICES

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 204





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

TRAVEL INDUSTRY (PROVIDERS, AIRLINES, HOTELS, ETC.) Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 178



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.



Due to the sample size, distribution values below 5% should be considered carefully.



100.0%

RESTAURANT INDUSTRY

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 189





Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.

PUBLIC UTILITY SERVICES

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 209



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

Importance of Different Distribution Channels for Initial Purchases



Due to the sample size, distribution values below 5% should be considered carefully.



 49,8%	

40.0% 50.0% 60.0% 70.0% 80.0% 90.0% 100.0%

8.4 Retailing Industries

OVERALL RESULTS

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 304



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.

OFFLINE RETAILING

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 140



TV Radio Magazines & Newspapers Internet Personal Selling Direct Marketing Instruments Recommendations from Family & Friends Public Advertising POS Information Social Media - Consumer Reviews Social Media - Recommendations from Friends Social Media - Advertising

TV

Radio

Internet

Personal Selling

Public Advertising

POS Information

Magazines & Newspapers

Direct Marketing Instruments

Social Media - Consumer Reviews

Social Media - Advertising

Social Media - Recommendations from Friends

Recommendations from Family & Friends

Symbols: (++) +10% (+) +5% (0) 2% (-) -5% (--) -10% The category "POS Information" cannot be compared due to measurement changes.

ONLINE RETAILING

Importance of Different Information Sources for Purchasing Decisions Number of cases in sample: 164



Symbols: (++) +10 % (+) +5 % (0) 2 % (-) -5 % (--) -10 % The category "POS Information" cannot be compared due to measurement changes.



- TV
- Radio
- Magazines & Newspapers
- Internet
- Personal Selling
- Direct Marketing Instruments
- Recommendations from Family & Friends
- Public Advertising
- POS Information
- Social Media Consumer Reviews
- Social Media Recommendations from Friends
- Social Media Advertising

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