Arab Social Media Report

كلية محمد بن راشد للإدارة الحكومية
MOHAMMED BIN RASHID SCHOOL OF GOVERNMENT

Social Media and the Internet of Things

Towards Data-Driven Policymaking in the Arab World: Potential, Limits and Concerns

7th Arab Social Media Report 2017 Edition

Social Media and the Internet of Things

Towards Data-Driven Policymaking in the Arab World: Potential, Limits and Concerns

The Arab Social Media Report series was initiated by the Governance and Innovation Program at the Mohammed Bin Rashid School of Government (formerly the Dubai School of Government) in 2011. It aims to enhance regional understanding of the impact of social media on societies, development and governance in the Arab region. During the past years, the findings of the series have contributed to global policy and scholarly discourses. They have informed decision making across multiple disciplines by providing regional data and in-depth analysis on the role of social media in development and digital transformations in the Arab region. The key objective of the report is to explore the following questions:

- How are societies and governments using social media across the Arab region?
- What are the demographic, gender and language usage trends?
- What factors affect the adoption of social media in the Arab states?
- What is the impact of the phenomena on public engagement, participation and social inclusion?
- How is social media impacting governance and public policy in the region?

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Salem, F. (2017). The Arab Social Media Report 2017: Social Media and the Internet of Things: Towards Data-Driven Policymaking in the Arab World (Vol. 7). Dubai: MBR School of Government.

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To access additional datasets and charts, not published in this report, join the Arab Social Media Report (ASMR) community and register (at no cost) online at: **www.ArabSocialMediaReport.com** Non-registered members can download the full report, and follow ASMR social networking groups through the website.

Introduction

The power and influence of social media has continued to grow globally over the past decade. During this period, the scope and scale of usage have changed dramatically, from the early days when social media was primarily fulfilling social needs of connectivity, communication, socialization and entertainment, to the current era, where social media applications are seen as important tools of governing, development, diplomacy and business. More recently, informational flows taking place through social media have been informing—and misinforming—public opinion and influencing policy development and political communication. For example, in 2015 and 2016, social media played a critical role in shaping public opinion internationally and on national levels, during numerous major events with global implications. During the past few years, as applications of "big data" and artificial intelligence continued to mature, the level of sophistication and influence of social media expanded further. As societal penetration rates increased, these data-driven applications started to provide deep insights into public views, sentiments, needs, behaviors and activities in numerous countries at unprecedented granular levels. The newfound insights harnessed through social media created new opportunities, as well as new risks.

During the past year, social media also played a highly influential role in what has been described as a "post truth" era in policymaking, diplomacy and political communication[1]. For example, social media "bots" arguably played a key role in influencing public opinion globally, whether on the political or public policy levels. Such bots rely heavily on big data analytics, artificial intelligence and machine learning algorithms, not just in gathering and crunching public views and sentiments, but more so in pro-actively influencing public opinions, decisions and behaviors. These rising social media activities were coupled with a flood of "fake news" techniques, that may have played a role in manipulating public perceptions and beliefs at large scales. Facebook was a primary example during 2016, where highly influential "fake news" flourished and penetrated public opinion in the US and Europe, which arguably had influential outcomes on global policy and the world order. By early 2017, Twitter has also been utilized as an influential tool of governing in the highest public office in the US and beyond. These uses undermined traditional information mediums, triggered foreign policy crises, impacted political communication and disrupted established policy formulation cycles.

1. By the end of 2016, the term "post-truth" (or "post-factual") became mainstream in many languages. For example, the Oxford University Press Dictionaries, selected the term as the "word of the year" that year. "Post-truth" refers to circumstances in which objective facts are less influential in shaping public opinion than perceptions and appeals to emotion and personal belief. Social media was seen as the primary medium enabling this phenomenon to flourish and expand.

On the other hand, the digital revolution has expanded the horizon of possibilities for development, governance and policymaking. The ever-expanding Internet connectivity of people and objects, and the maturity of big data and artificial intelligence applications are together ushering what has been described as the "fourth industrial revolution". This new disruptive transformation is characterized by a fusion of inter-connected technologies where the digital, physical and biological worlds converge. This inter-connectivity is generating—and consuming—an enormous amount of data that is changing the ways policies are conducted, decisions are taken and day-to-day operations are carried out. Within this context, 'big data' applications are increasingly becoming critical elements of policymaking. Coupled with the rise of a critical mass of social media users globally, this ubiquitous connectivity and data revolution is promising major transformations in modes of governance, policymaking and citizen-government interaction.

In the Arab region, there are already numerous experiments and applications where data from social media and the "Internet of Things" (IoT) are informing and influencing government practices as sources of big data, effectively changing how societies and governments interact[2]. These two sources, among others, are already influencing policymaking, public engagement and other means of citizen-government interactions in the region.

The sources of big data are numerous. These include, open government data, financial transactions data, geo-spatial data, societal "lifestyle" data, social media data, data generated by Internet-enabled devices (IoT), sensors data, machine-to-machine data, data from security systems, among many other sources. In this edition of the Arab Social Media Report series, we explore the potential limitations and concerns related to this phenomenon by focusing on two key sources of big data: social media and IoT data. Observations and anecdotal evidence from public sector and decision-making organization in the region suggest that there is limited understanding of the real potential, the limitations, and the public concerns surrounding these big data sources in the Arab region. This report contextualizes the findings in light of the socio-technical transformations taking place in the Arab region, by exploring the growth of social media and building on past editions in the series. The objective is to explore and assess multiple aspects of the ongoing digital transformation in the Arab world and highlight some of the policy implications on a regional level. More specifically, the report aims to better inform our understanding of the convergence of social media and IoT data as sources of big data and their potential impact on policymaking and governance in the region. By using a triangulation of research approaches it digs into several critical dimensions of this phenomenon. Ultimately, in light of the availability of massive amount of data from physical objects and people, the questions tackled in the research are: What is the potential for data-driven policymaking and governance in the region? What are the limitations? And most importantly, what are the public concerns that need to be addressed by policymakers while they embark on next phase of the digital governance transformation in the region?

The report has two main parts. In the first part, we explore the questions discussed in the previous paragraphs through a regional survey spanning the 22 Arab countries. In the second part we continue the tradition set in the previous editions of the Arab Social Media Report series by exploring the growth and usage trends of influential social media platforms across the region, including Facebook, Twitter, Linkedin and, for the first time, Instagram. The findings highlight important changes—and some stagnation—in the ways social media is infiltrating demographic layers in Arab societies, be it gender, age and language. Together, the findings provide important insights for guiding policymakers, business leaders and development efforts. More specifically, these findings can contribute to shaping directions and informing decisions on the future of governance and development in the Arab region.

2. Definitions of "social media", "IoT" and "big data" as the key terms discussed in the paper, are included in Annex 3

1.

Social Media and IoT for Data-Driven Policymaking: Potential, Limits and Concerns of Big Data and Governance in the Arab Region

Based on a regional survey, this section presents some of the key findings on the uses of social media data, IoT data and their convergence as a source of big data. It also explores public views and perceptions on the potential role of this data in influencing policymaking. The findings primarily highlight the public concerns on personal data use by governments and businesses, the limitations facing data-driven policymaking and potential policy responses and actions to tackle these concerns and limitations.

1.1. Social Media Data and Public Policy

Despite the many promises, the value of social media in public policy in the region has numerous limitations. The section provides key findings of the survey related to these limitations.

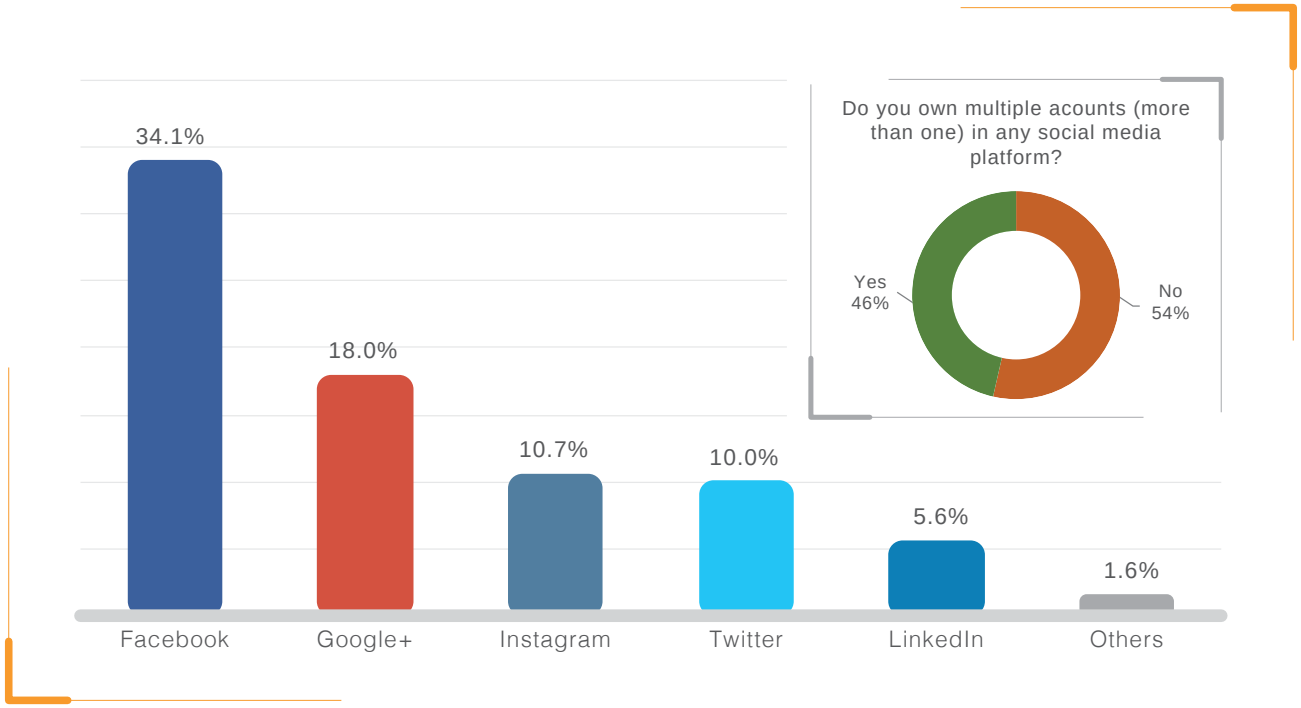
- **False Personal Information:** 15% of respondents said that they provide false information on social media.
- **Closed Social Media Accounts:** Around 44% of respondents in our survey said that they have closed down or abandoned at least one social media account in 2016.
- **Location services:**
  - A third of respondents actively disable location-based services when using all social media platforms.
  - Around 40% allow location services only on some social media platforms.
  - One in five respondents said that they intentionally allow location services on all social media platforms they use.
- **Multiple Accounts:** Across the Arab region, 46% of respondents said that they own multiple accounts in at least one social media platform.

Social Media for Data-Driven Policymaking – Exploring the Limitations

1) Flawed Representation: Even when social media penetration reaches 90% of the population in some countries, social media data may still provide flawed representation of societal breakdowns. This is especially true if used in isolation in big data analysis as a source of representative voice online. One example is the common regional behavior among social media users of owning multiple accounts on a single social media platform with diverse usage trends in terms of sharing sentiments or opinions. For example, in our survey, 46% of respondents said that they own multiple accounts in at least one social media platform. These users may have different "voices" or varied representation of their views on each of these accounts. The reasons behind this behavior may be related to political and cultural restrictions or the contrasting objectives that may exist for people using social media platforms.

In terms of platforms, more than 34% of respondents said that they own more than one Facebook account (representing 73% of those who said that they own more than one social media account on a single platform). Other social media platforms have considerably less ownership of multiple accounts according to our survey respondents. Around 18% said that they own more than one account on Google Plus, 10% on Instagram and Twitter each, and just above 5% on LinkedIn. While this behavior differs from one country to another, this is one example of how social media demographic data can be misleading or non-representative.

More Than One Account: Which Social Media Platform Do You Own More than One Account in?

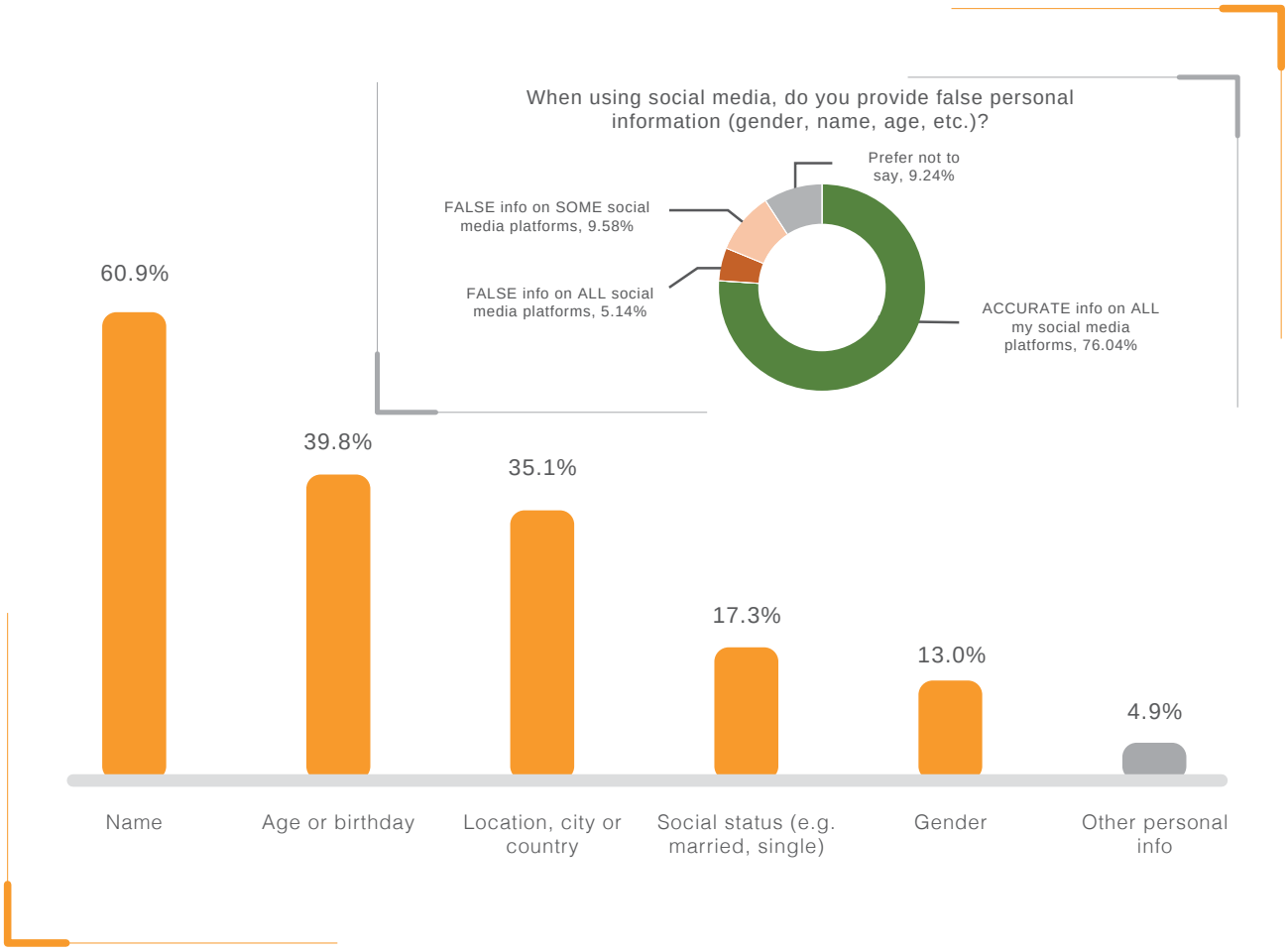


2) False Information: One of the key sources of insight data derived from social media is the ability to segment people's views, behaviors and sentiments based on their demographic information shared over social media. Such data includes age, gender, language and other demographic and behavioral data that is usually directly shared by social media users or can be easily extracted. However, in the age of mass online surveillance, "fake news" and large-scale privacy breaches, it is no secret that many social media users provide false information when using social media platforms. Moreover, the number of fake accounts, or even machine-operated accounts, or "bots", is difficult to assess but is arguably large.

One important question for social media-driven policymaking here is: how much false information is out there? And what personal information shared online is false? According to our survey, around 15% of respondents in the Arab region openly said that they provide false personal information on all or some social media platforms (10% on some platforms and 5% on all platforms). Meanwhile, around 76% of users said that they always provide accurate personal information when using social media platforms.

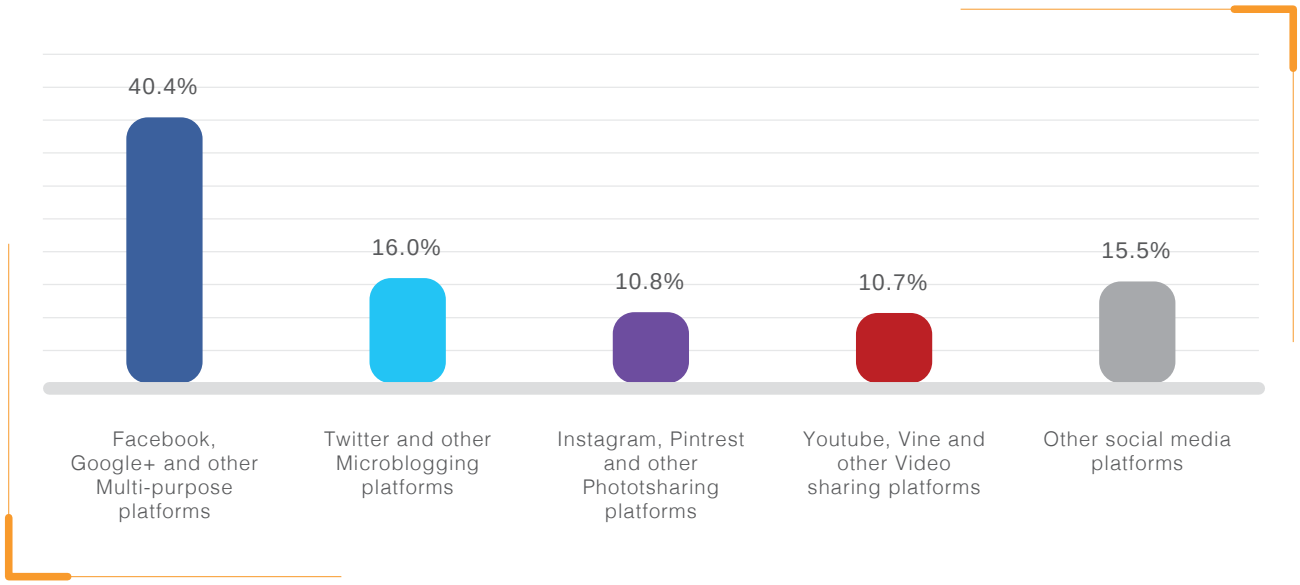
What false personal information do people provide? According to the survey respondents who said that they do provide false personal information on social media, the person's "name" is the top false piece of information provided in the Arab region. Around 61% of those respondents said that they provide a false name (9% of all social media users), followed by 40% who said that they provide false birthday or age (6% of all respondents). Around 35% said that they provide false location, such as the city or country (5% of total), 17% said that they provide false social status, such as if married or single (2.6% of total) and 13% said they provide false gender information (less than 2% of total social media users in our survey).

What False Information do you Usually Provide on Social Media? (out of respondents who said they provide false information)



On what social media platforms do people in the region usually provide false information? Around 40% of those who said that they provide false personal information when using social media are doing so on multi-purpose social media platforms such as Facebook and Google Plus. Around 16% said they provide false personal information on Twitter and other microblogging platforms, 11% on photo-sharing platforms such as Instagram, and another 11% on video-sharing platforms such as Youtube.

On which social media platforms do you provide false personal information?

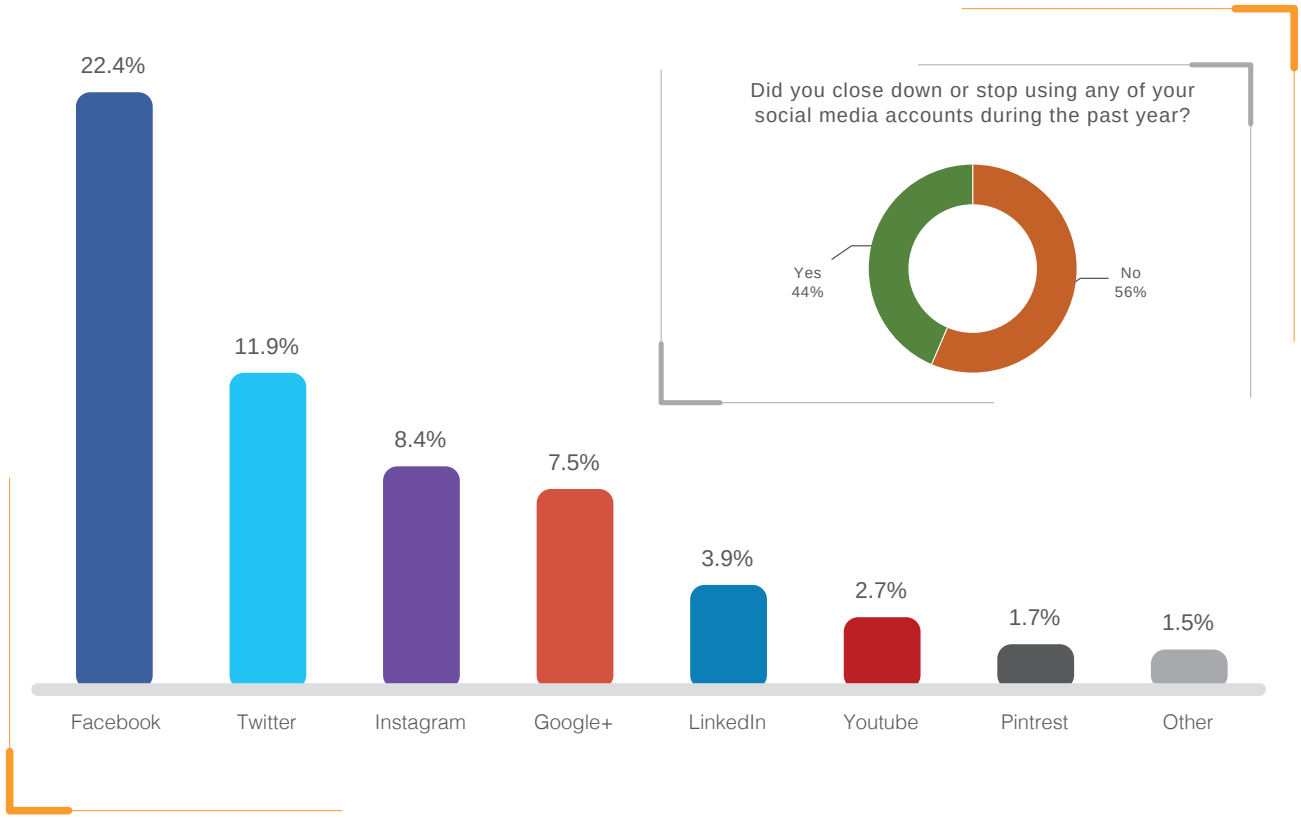


Such false personal information is usually fed into demographic analysis of social media data within electronic participation initiatives or big data-driven policymaking cycles. Accounting for and correcting for such misrepresentative demographic data is critical when social media data informs policy formulation cycles.

One important note to be made here, is that the data presented by the survey is self-reported. As such, it would be wise to consider the possibility of different levels of social desirability biases in responses provided in some countries or by some segments in society. For example, it is difficult to tell exactly how many of the respondents who said that they always provide accurate personal information on social media (76% of respondents) are being truthful and how many are trying to be politically or socially correct in their answers. Moreover, some—or arguably most—of the 10% of respondents who said that they prefer not to answer the question may very well opted to not give an answer because they do provide false personal information online, but prefer not to say this openly for obvious reasons.

3) Validity of Over-Time Data: In addition to the risk of under-representation (or over-representation) of societal voices, sentiments and opinions, actual possession and levels of activity of social media accounts are fluid and vary with time. People do change behaviors and activity, "migrate" to alternative platforms and even close or abandon social media accounts over time. When extracting longitudinal or panel data about certain segments in society at different points of time through social media platforms, considerable amount of noise can be introduced in the analysis. For example, no less than 44% of respondents around the region said that they have closed down or abandoned at least one social media account in 2016. More specifically, around 22% of respondents said that they closed or abandoned a Facebook account during that year, 12% closed or abandoned a Twitter account. Other accounts people said they stopped using include: Instagram (8%), Google Plus (8%) and LinkedIn (4%). Around half of those who said that they have closed or abandoned at least one of their social media account, said that they closed a Facebook account. Almost 1 out of 4 said that they closed or abandoned a Twitter account, 1 out of 5 an Instagram account, and 1 in 10 stopped using a LinkedIn account.

Users Who Closed (or abandoned) Social Media Accounts During the Past Year (of out Total Survey Respondents)

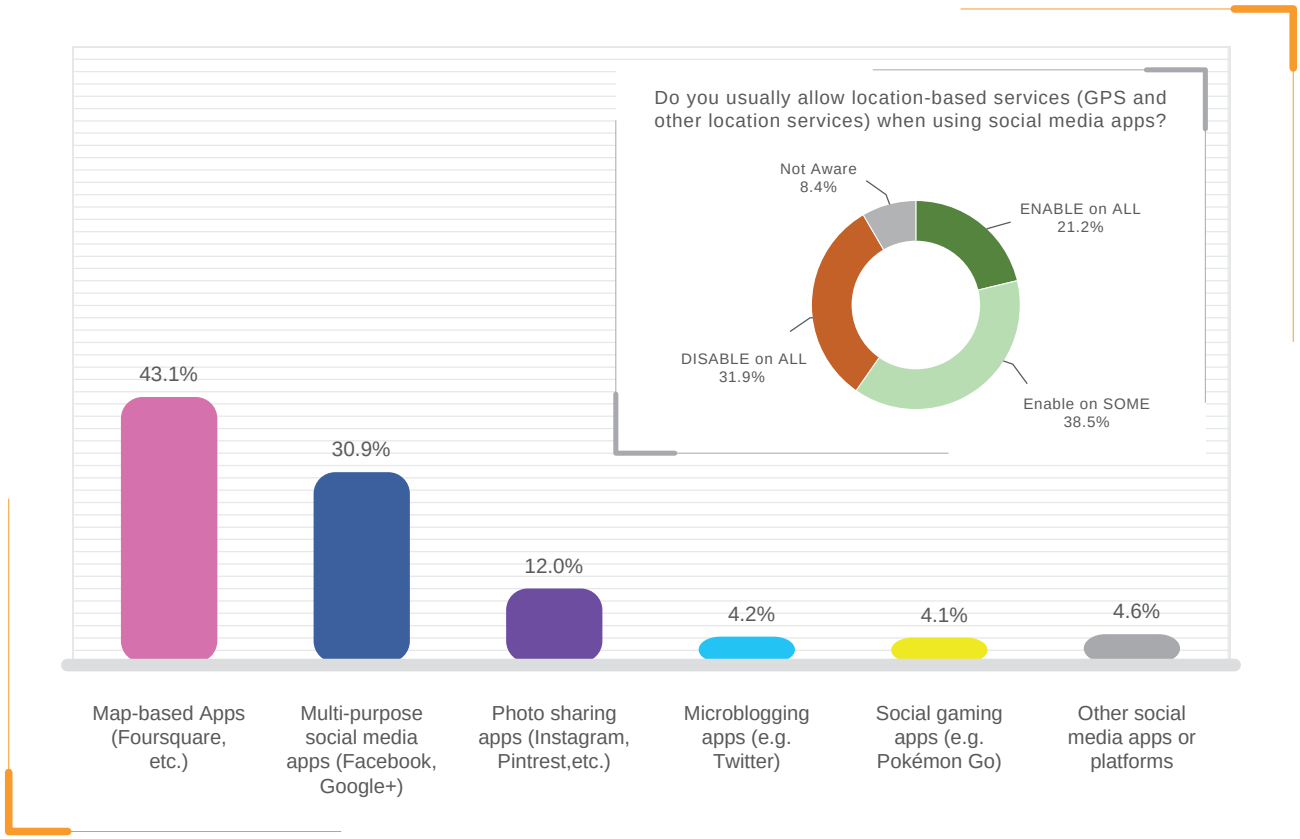


4) Geolocation: Much of big data-driven analyses, especially for development and policymaking, rely on location as a critical attribute. For example, geo-locating social media users is important when deciding on the weight that should be given to their views or sentiments with regards to government services in certain areas, their proximity to certain events and if they are living in the country, or one of its regions at all. Identifying geolocations of users is also as important for big data-driven decisions made in the private sector, such as customer service, investment options and advertisement decisions, among many other uses. However, locations on social media can be intentionally or unintentionally misguiding. For example, according to our survey a third of social media users in the Arab region intentionally and actively disable location-based services when using any social media platforms. Meanwhile, around 40% said that they consciously allow location services only when using some social media platforms while disabling location services on others. A fifth of respondents in the Arab region said that they intentionally allow their location to be identified, by enabling location-related services on all platforms.

Overall, the findings of the survey suggest the existence of a healthy level of awareness about the availability and ability to control location-services when using social media in the region. Only 9% of respondents said that they are unaware of the location services functions or how to enable or disable them on social media.

Additionally, the type of social media services seems to affect the behaviors and preferences of users when deciding on sharing their location. Expectedly, of those who said that they intentionally disclose their location when using social media platforms or allow their location to be shared, the majority enables this on location-driven or maps-based social media platforms, such as Foursquare. Meanwhile, only 30% said that they allow location services on multi-purpose social media platforms such as on Facebook or Google Plus. Around 12% of respondents said that they allow location to be shared when using photo-sharing apps, such as Instagram or Pinterest; and only 4% when using microblogging services such as Twitter.

When using social media (on mobile or other devices), on which platforms do you allow location-based services (e.g. GPS)? (out of respondents who said they Enable location services)



Finally, while public or private institutions and authorities can still identify and locate users through numerous complex methods, the users' behaviors highlighted in our findings add additional noise to the data and provide multiple layers of complexity, regardless of the methods used. Creating robust and segmented analysis on where public views or sentiments are coming from is important when analyzing social media data. This helps avoid voices becoming amplified or underrepresented among different segments of society. As such, it is critical to adjust and correct for such noise in algorithms or analyses that rely on social media as a big data source in decision-making or public policy design.

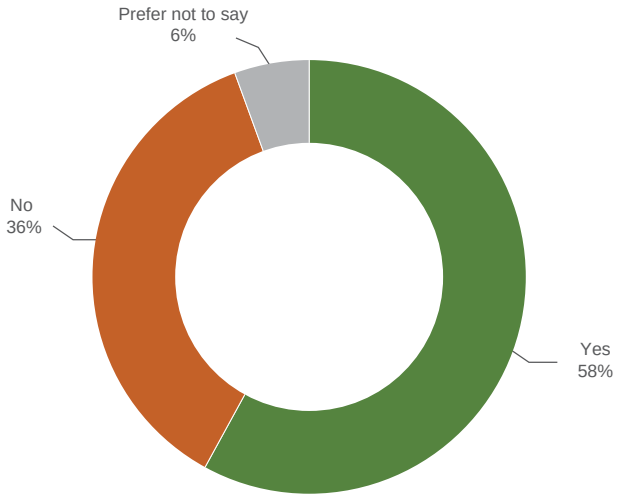
Sentiments and Views on Public Policies and Social Media – Trends and Limitations

According to the findings of the Arab Social Media Report series, people in the Arab region have adopted social media applications in all aspects of their lives, including interacting with their governments regarding public services[3]. However, beyond government services, do people in the region use social media to express their views and opinions on public policy issues?

According to our survey, a majority of social media users in the Arab region (58%) said that they express their views or sentiments regarding their government's policies using social media. This includes for example, expressing their satisfaction, happiness, anger and disapproval textually or visually. Around 86% of those who use social media to express views on government policies, said that they use Facebook to do so. Only 28% said that they use Twitter, and another 28% use messaging apps, such as WhatsApp to express view on government policies. Less than 10% of respondents said that they use each of the other categories of social media platforms, such as Google Plus, Linkedin, photo-sharing or video-sharing sites.

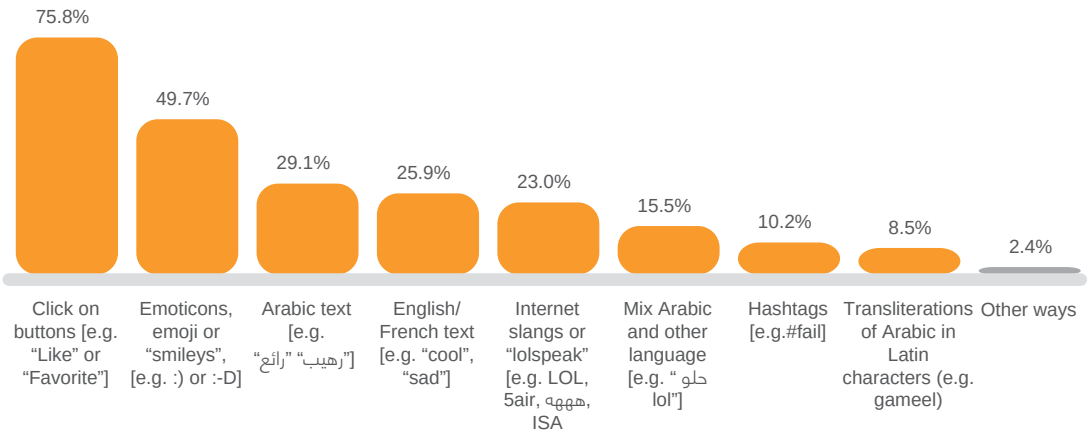
3. The Arab Social Media Report (Vol. 6), Citizen Engagement and Public Services in the Arab World: The Potential of Social Media. Dubai: Governance and Innovation Program, Governance and Innovation Program, MBR School of Government – Available at www.ArabSocialMediaReport.com

Do You Use Social Media to Express Your Sentiments or Views on Government Policies or Services?

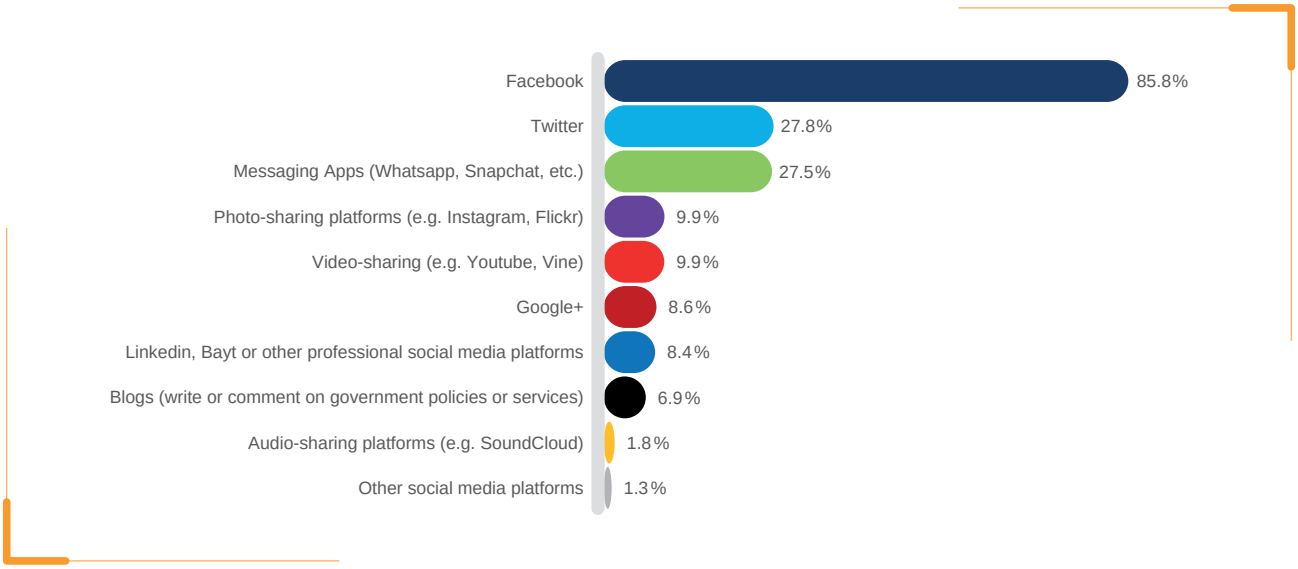


However, how do people usually express their sentiments on social media in the region in general? A large majority of our survey respondents (76%) said that they do so by clicking on corresponding buttons when available, such as “Like”, “Dislike” or “Favorite”. Around 50% said that they express views or sentiments on social media using “emoticons”, “emojis” or “smileys”. Across the region, around 30% express their views by typing expressions using Arabic text and characters, while another 26% do so using Latin characters, primarily in the English or French languages. Internet “slangs” or “lolspeak” come next in the ranks of how people prefer to express their views on social media in the region (23%). Meanwhile, around 15% said that they combine Arabic and English text while they express their views on social media. Only less than 10% of respondents said that they use “hashtags” as a way to express sentiments on social media. Transliteration of Arabic text using Latin characters, a formerly common practice during earlier days of Internet development, is still preferred by around 8% of respondents in expressing their sentiments on social media. These expression styles on social media in the region, especially in light of the diverse linguistic usage trends online, may increase the complexity of efforts to harness representative samples of voices or views online. On the technical level, the diverse styles of online expression in the region, which vary from region and country and even city to another, also make relying on big data algorithms and methods in sentiment analysis more complex and less reliable.

How Do You Usually Express Your Sentiments or Views When Using Social Media (e.g. satisfaction, happiness, disapproval, anger, etc.)?



When Expressing Your Views on Government Policies or Services, What Social Media Platforms do You Usually Use?



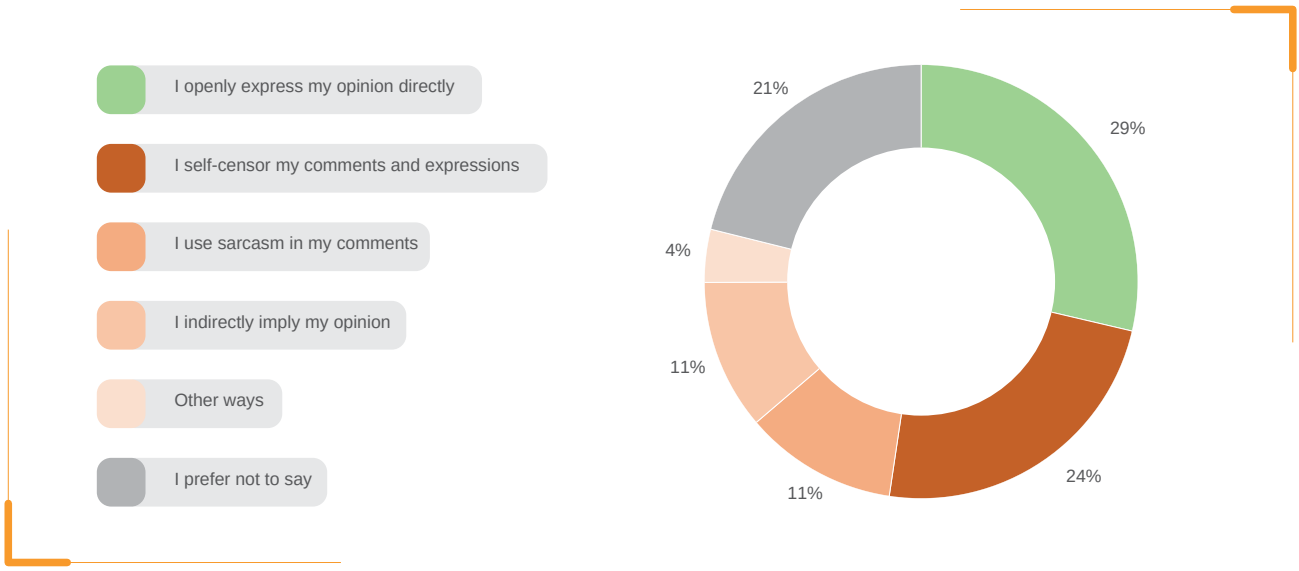
These findings shed light on people's general preferences while expressing their sentiments and views on social media in the region. However, a much more important question arises when considering online social media interactions as input into policymaking: How open are people in the region when they express their negative views on social media, specifically when unsatisfied or unhappy with government policies? In our survey, only 29% of respondents said that they openly and directly express their views on social media when unhappy or unsatisfied with government policies. Meanwhile, around a quarter of respondents said they self-censor their comments, expressions or opinions on social media in such cases. Around 11% said that they use "sarcasm" when expressing their negative views on social media about government policies or services, and another 11% said that they try to indirectly imply their views.

How open are people in the region when they express their negative views on social media, specifically when unsatisfied or unhappy with government policies?

These online behaviors are problematic when relying on social media as a big data source for analyzing public sentiments and opinions in the region. In light of these regional findings, the reliability of sentiment analysis algorithms across wide parts in the region should be questioned. Regardless of how sophisticated sentiment and behavior analysis algorithms are, the capability of such algorithms to peel away diverse cultural and linguistic layers and extract meaning from social media interactions in the region should be examined thoroughly, especially in policymaking circles. For example, it is difficult to imagine extracting meaningful outcomes from a tweet or a post when a social media user in the Arab region expresses a view indirectly using a sarcastic tone, through a combination or Arabic and Latin characters in a local dialect, combined with an Internet slang and a bunch of emojis. While some algorithms' accuracy may increase if they are fine-tuned and adjusted to behaviors of small populations, until textual big data analytics mature with advanced contextual abilities, the findings on these behaviors suggest limited potential of using textual big data analytics across the social media realm for policy development in the region.

Regardless of how sophisticated sentiment and behavior analysis algorithms are, the capability of such algorithms to peel away diverse cultural and linguistic layers and extract meaning from social media interactions in the region should be examined thoroughly, especially in policymaking circles.

When Unhappy or Unsatisfied with a Government Policy, How do You Usually Express Your Views on Social Media?



Public Concerns on Existing Government Practices on Social Media

Governments around the world are proactively experimenting with social media data and interacting with social media users in a variety of ways. The spectrum of uses varies from benign and positive uses, to manipulative and aggressive ones. For example, some governments may rely on social media data for trend and sentiment analysis, feeding into policymaking with the objective of aligning policy development with public needs, concerns and preferences. Others capture and store massive amounts of activities and personal data on social media users for profiling and behaviors analysis. One of the common practices in recent years, is moving beyond listening and analyzing; instead governments are utilizing artificial intelligence and machine learning through software "bots" with the objective of influencing public perceptions and beliefs, and direct policy outcomes. Similarly, in another growing practice, some authorities recruit social media users, whether widely followed "influencers" or large masses of unidentified users for the same purposes. We surveyed public views around the region regarding these practices by presenting them with brief descriptions and related scenarios.

Trends analysis, where general trends are extracted by analyzing public data available on social media, was the only big data-driven government practice supported by a majority of respondents. Around 51% percent either support this practice without concerns (17%) or support it with some concerns (36%). Meanwhile, a majority of respondents expressed their rejection in general to all other practices presented. Other government practices examined are listed from the least to most in terms of people's disapproval:

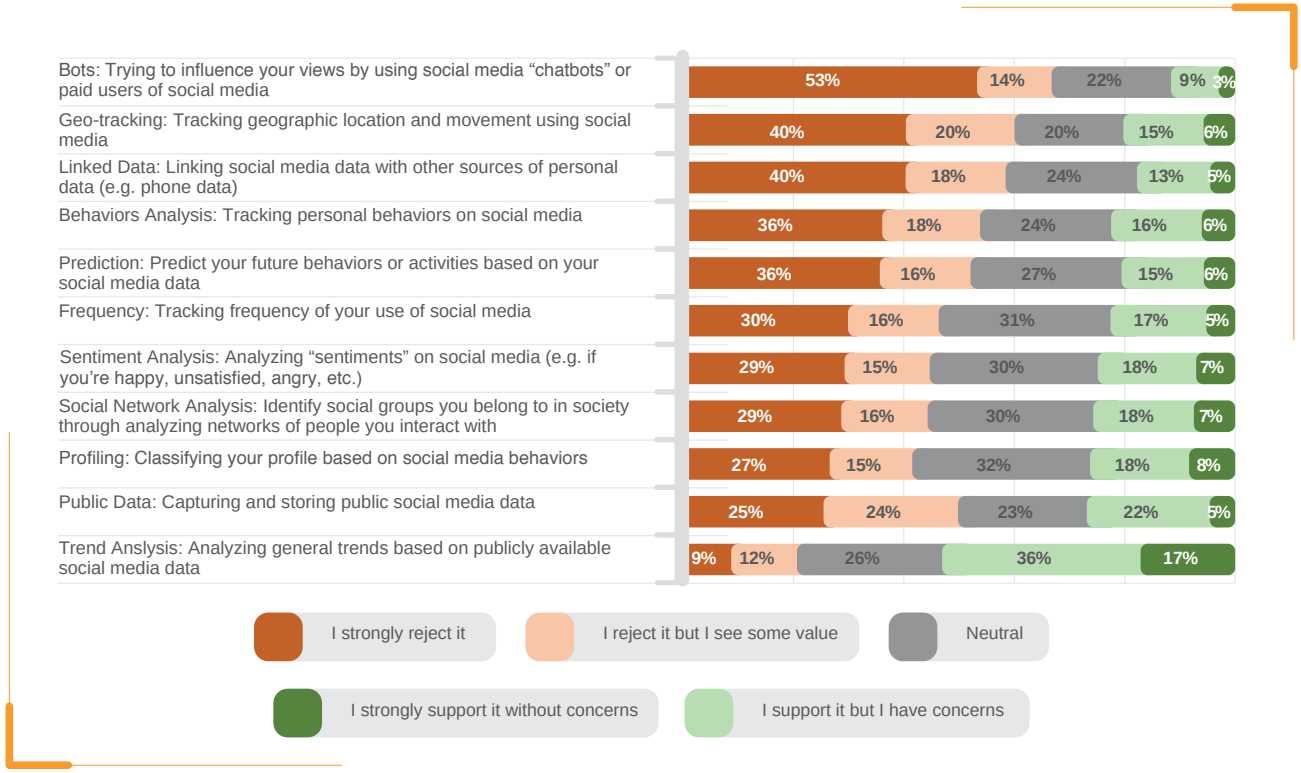
1. Capturing and storing public data from social media.
2. Profiling and classifying individuals based on social media behavior.
3. Identifying social groups the individual belongs to through analyzing their social networks online.
4. Analyzing social media users' sentiment, such as their level of satisfaction, disapproval, etc.
5. Tracking the frequency of social media use.
6. Predicting future activities based on social media data.
7. Tracking personal behaviors and actions of social media users.
8. Linking social media data with other sources of personal data.

9. Tracking location or movement of social media users.
10. Using social media bots to try to influence public perceptions, views, beliefs or sentiments.

Other than general trend analysis using social media data, respondents who said that they support any of these practices without concerns did not exceed 8% for each. Government attempts to influence public views by using social "bots" or recruited users on social media received the highest percentage of negative views by our survey respondents (53% strongly reject this use, and 14% reject it while seeing some value). In general, around 20 to 30 percent of respondents said that they have no opinion on these practices. This response may be reflective of lack of full understanding of these practices, or because the respondents in this case intentionally preferred not to comment and held back their opinions on these practices. Overall, taken collectively, the findings strongly suggest that the public across the Arab region is generally concerned about the use of personal social media data by governments, and the activities some government take on social media.

Government attempts to influence public views by using social "bots" or recruited users on social media received the highest percentage of negative views by our survey respondents

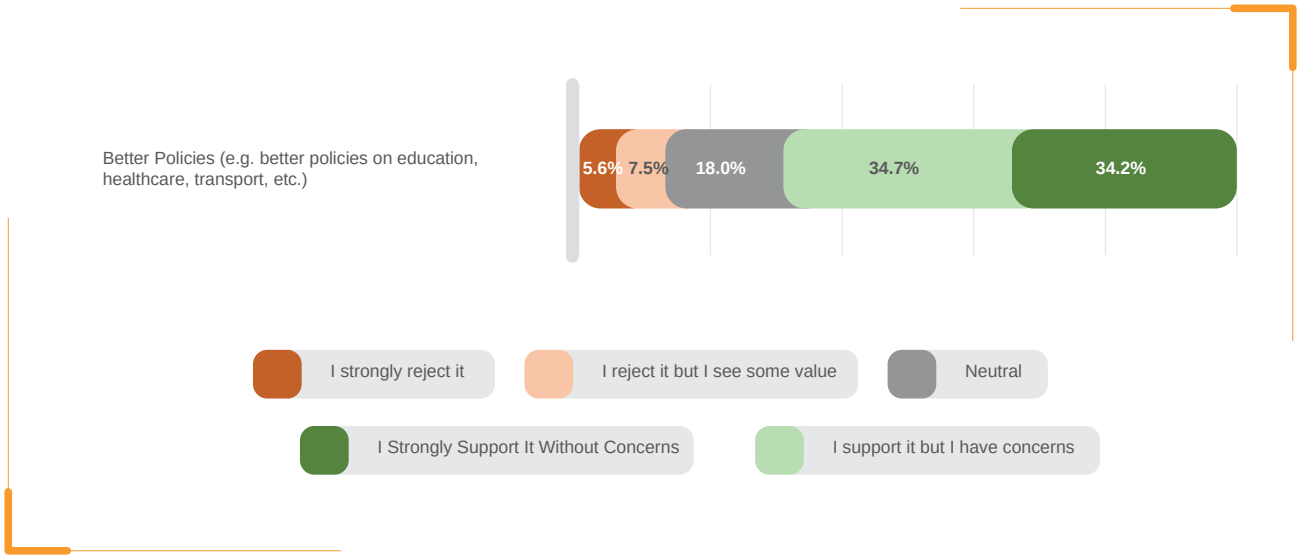
Views on Governments' Practices on Social Media



However, despite the clear negative views about using personal social media data by governments, our survey respondents' views changed if the usage of personal social media data by the government led to positive policy-related outcomes. When asked about their level of support for using personal social media data in some scenarios, a majority of respondents supported government use of their social media data if it leads to positive policies. Around 34% of respondents supported, without concern, using personal social media data by government, if this leads to better education, healthcare or transport policies. Another 35% also supported this, but with some concerns. In total, 69% of respondents support the use of their social media data if this leads for example, to better policies.

It is noteworthy that the level of support for using social media data in policymaking among our survey respondents is slightly higher than their support for using personal social media data for government service delivery. On the other hand, only 13% rejected using personal social media data by government, even if it leads to better policies.

If the use of your personal social media data by governments leads to any of the following beneficial outcomes, would you support it?



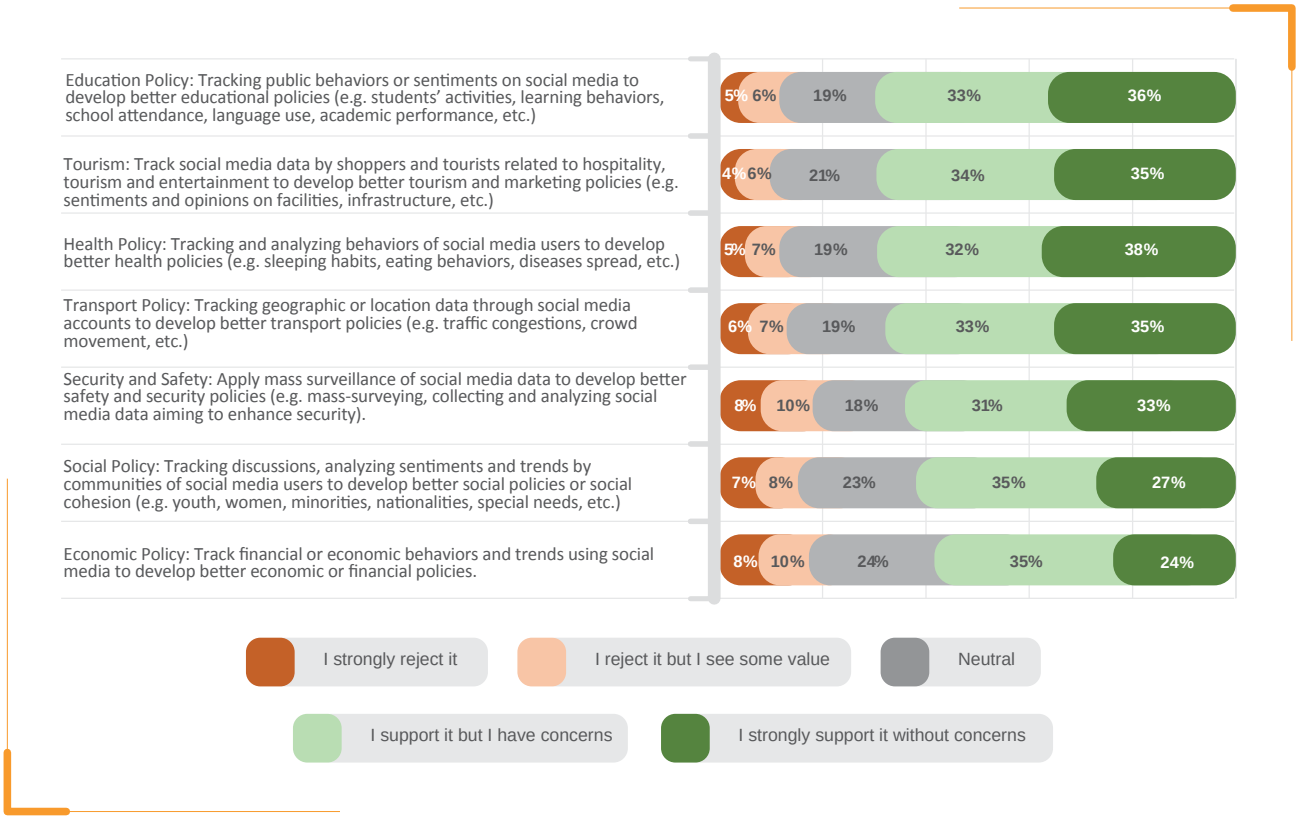
What Policies? Data-driven Public Policy Formulation by Governments

Survey respondents were presented with some practices where social media data interact with public policies in different government sectors. The scenarios presented were suggested based on existing practices of using social media in data-driven policy formulation globally, whether such practices existed in the region or not.

In general, there is a wide support for using social media in all public policy development scenarios presented. Around 60 to 70 percent of respondents in general supported the use of their social media data by governments in most categories of public policy formulation. Based on the scenarios presented, respondents supported the use of social media in the development cycle of the following policies respectively: health policies (70%), education policies (69%), tourism policies (69%), transport policies (68%), and security and safety policies (64%). However, while most respondents supported the use of social media data in security and safety related policies, these types of policies also received the largest share of negative responses. Around 20% of respondents said that they reject the use of their social media data in security or safety related policy formulation. Across the board, out of those who supported the use of social media data in public policy formulation, almost half of them said that they support it but they have concerns.

Meanwhile, scenarios where social media is used for social or economic policies—while still largely viewed positively—received less support by respondents. Around 59% of respondents said that they support the use of their social media data in developing economic policies, and 62% in social policies.

Government Policies and Social Media: In each of the following scenarios, how would you describe your views about the following uses of social media by government for public policy formulation?

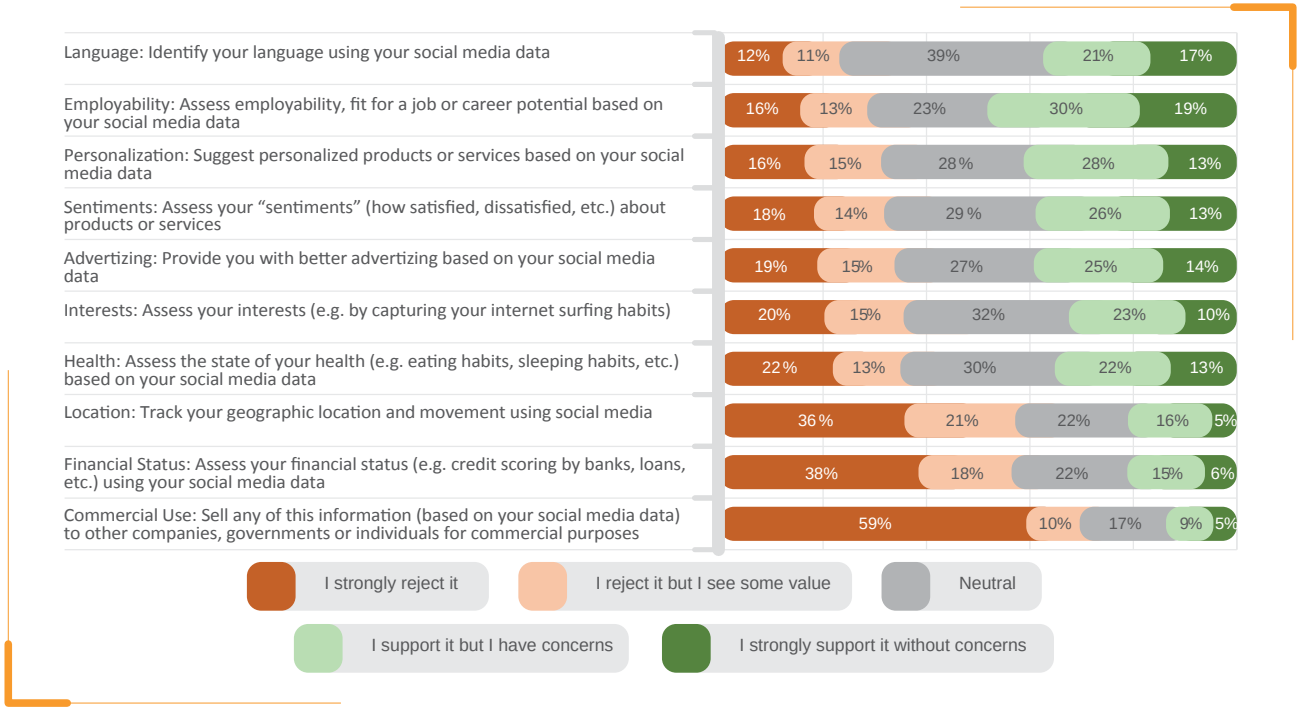


Private Sector Use of Social Media Data

For comparison, respondents were also presented with scenarios on the use of social media data by the private sector and businesses. These scenarios were also based on existing practices by private sector entities globally or in the region related to using of social media data.

The practices that received the largest support in terms of private sector use of personal social media data were: Assessing employability and fit for the job of social media users (49% supported and 29% rejected), personalization of services and products based on social media data (41% supported and 21% rejected). Public opinion was split regarding the following uses: sentiment analysis to assess customer satisfaction with products and services (39% support and 32% reject), advertising based on social media uses (39% support and 34% reject). Meanwhile, the largest share of negative views by respondents was expectedly related to the commercial use of social media users' personal data, where such data is sold or bought (69% rejected it with 59% strongly reject it). Assessing financial status and location based on social media data also received negative views by the respondents.

Views on Private Sector Practices on Social Media



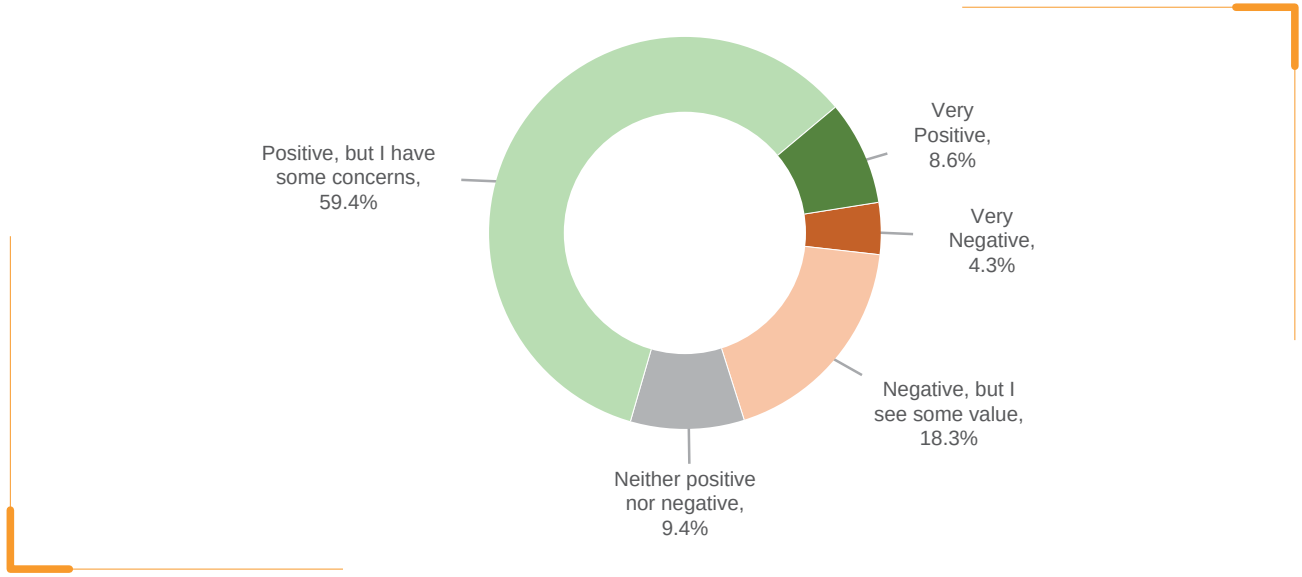
1.2. IoT Data and Public Policy

In addition to its numerous other promises, the Internet of Things (IoT) can also be a rich source for data for policy and decision-making. In the region, the rapid proliferation of devices and sensors that connect to the Internet are a key source of data that public and private entities are exploring, both for business and public policy objectives. Smart mobile phones, wearable devices, internet-enabled entertainment systems, home appliances, connected vehicles and sensors are just a few elements of the massive network of interconnected devices that generate enormous amount of rich data. The promises are huge, but so are the limitations, risks and public concerns.

- **Human-IoT Connectivity:** Half of the respondents in the Arab region (47%) have apps installed on their smart phones that interact with physical IoT devices
- **IoT Penetration:** Around 55% of households in the region have 2 to 5 Internet-enabled devices and another 25% have 6 to 10 internet-connected devices based on our survey.
- **Most Common IoT Devices:** Around 65% of respondents said that they own an Internet-enabled device that classifies as an entertainment device, with Internet-enabled TVs being the largest category (20%).
- **Wearable IoT Devices:** Only 8% own wearable devices such as smart watches, wristbands, etc. that connect to the Internet
- **IoT Appliances:** Less than 7% own physical appliances that connect to the Internet, such as security systems, smart meters and home electrical appliances
- **Connected Vehicles:** Internet-connected cars are owned by less than 4% of the respondents in the Arab region.

The majority of respondents around the region positively viewed the increased Internet-enablement of everything. However, around 60% said that while they view this growth positively, they also have some concern. Meanwhile, around 23% viewed the universal connectivity in negative light (18% had negative view but said that they see some value in this trend). This finding indicates a healthy level of awareness in the region about both the potential and risks associated with IoT. For example, the expansion of IoT infrastructure is increasing the likelihood of a magnitude of threats occurring. These range between breaches of privacy, mass surveillance, proliferation of ransomware and malware, to cybersecurity threats that are life-threatening on the personal level and highly risky for businesses and national interests. On the brighter side, the promises put forward by IoT implementations for increased government responsiveness, efficiency, and better adapted public policies are widely acknowledged as well.

How do you feel about a future where almost everything around you would be connected to the Internet and interacting with other devices?



The Limitations of IoT in Policymaking in the Arab Region

Internet connectivity is expanding rapidly in the Arab region. Mobile and smart phones penetration are among the highest globally in some parts of the Arab world[4]. With expanding smart city transformations, digital government and electronic participation initiatives, experiments with IoT applications are already taking place in the region. These experiments view IoT both as a source of big data for decision making, as well as an enabler of citizen-government interactions, customer-engagement and data-driven policymaking. Despite their widely acknowledged promises, there are still numerous limitations for IoT applications in public policy formulation. For example, how connected are individuals in the region in terms of IoT devices and objects? How feasible are IoT implementations as reliable sources of data and enablers of engagement?

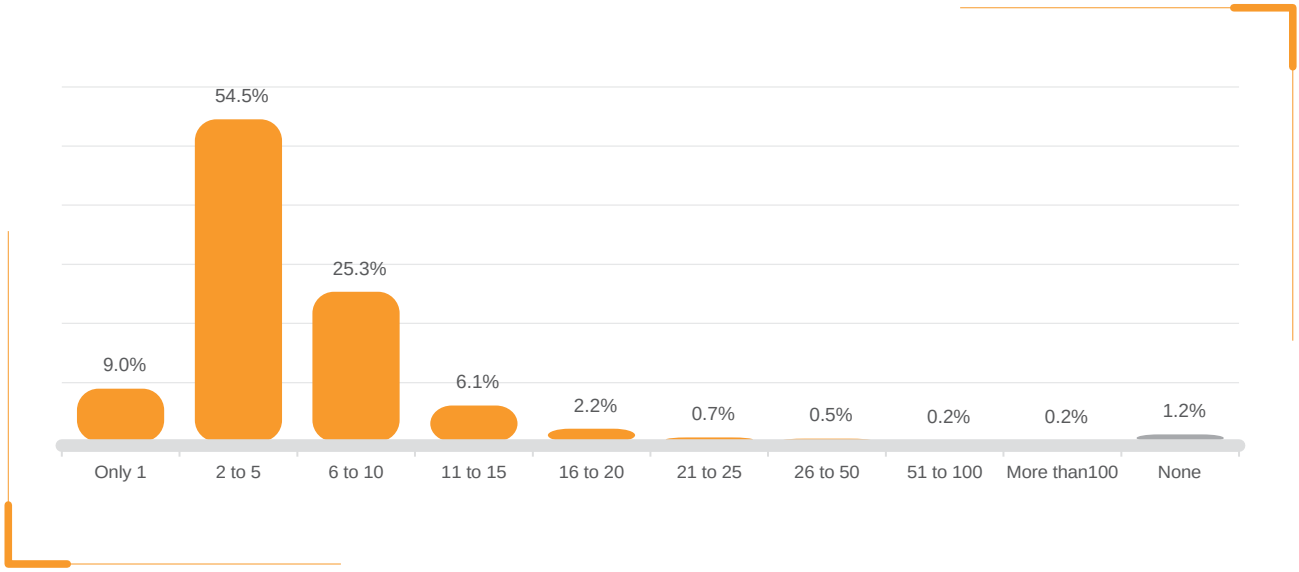
Scope of IoT Connectivity in the Arab Region

According to our survey of Internet users, around 55% of households in the region have 2 to 5 Internet-enabled devices (other than computers and laptops) and another 25% have 6 to 10 internet-

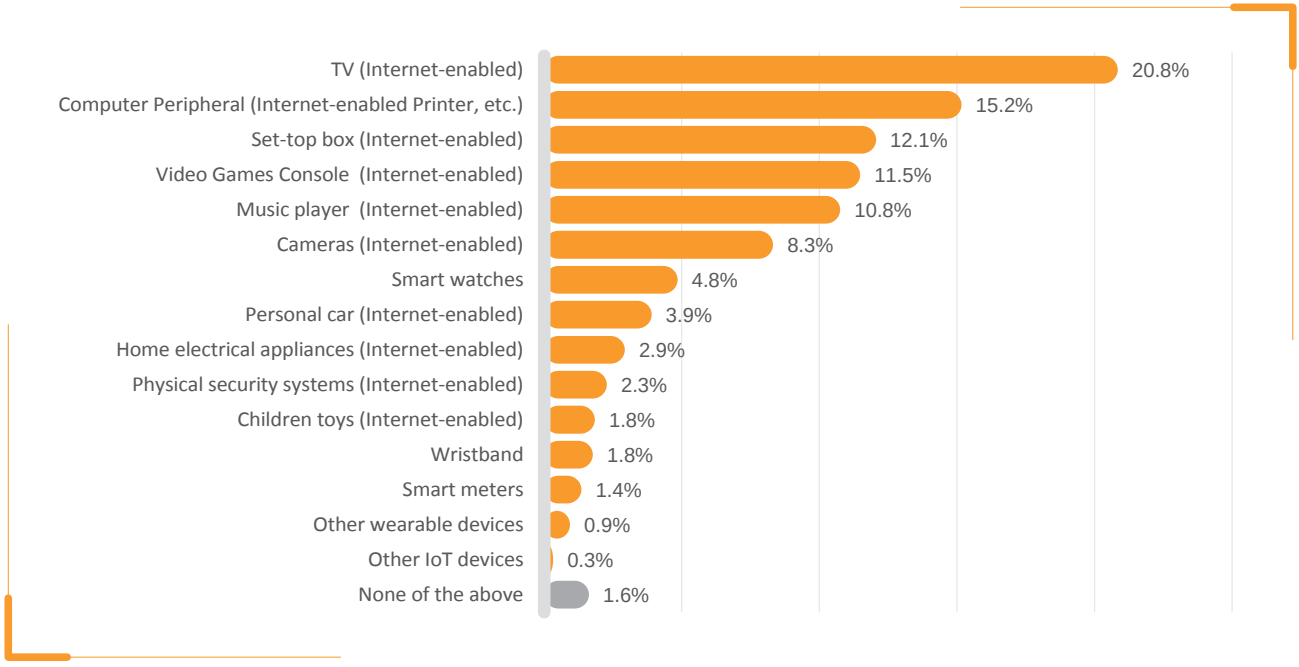
4. The Arab World Online 2017. Mohammed Bin Rashid School of Government, Dubai.

connected devices[5]. These include all types of Internet-enabled devices, whether personal or otherwise. Entertainment devices dominate most of the IoT devices in the region according to our survey respondents. Around 65% of respondents said that they own an Internet-enabled device that classifies as an entertainment device (TV, video games console, set-top box, cameras, music player, toys, etc.), with Internet-enabled TVs being the largest category (more than 20% of all respondents). This is followed by computer peripherals that connect directly to the Internet, such as printers, cameras and other devices. Only around 8% of respondents said that they own wearable devices such as smart watches, wristbands, etc. Meanwhile, less than 7% own physical appliances that connect to the Internet, such as security systems, smart meters, home electrical appliances and less than 4% own internet-connected vehicles. While uptake of IoT devices is increasing, the potential for utilizing the networks of personal IoT devices in data-driven policymaking is becoming more feasible. However, so far, the types of devices and ways of usage may limit the feasibility of utilizing the network of IoT devices as a meaningful and reliable source of societal big data in the region.

Internet-Enabled Devices Ownership per Household in the Arab Region 2017 (survey self-reported)



Internet-enabled Devices Ownership by Type in the Arab Region 2017 (survey self-reported)

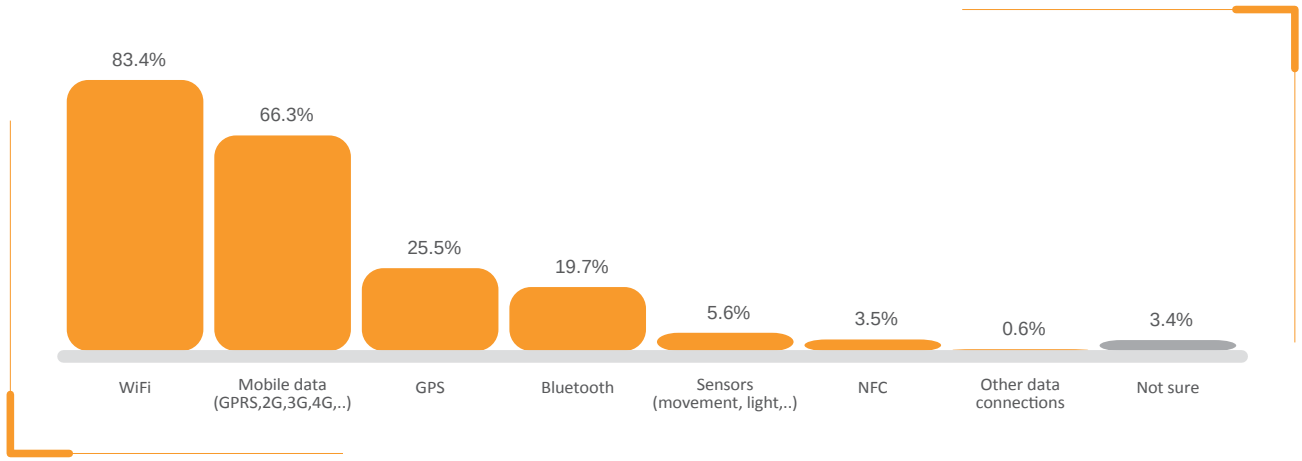


5. It is worth reminding that our research surveys Internet users in the region, which by definition are connected to the Internet one way or another.

Modes of Connectivity

According to the survey respondents, people in the region usually connect to the Internet through Wi-Fi (83%) when using Internet-enabled devices, such as phones, laptops, tablets, among others. Data connectivity over mobile subscriptions with service providers, such as through 3G, 4G or LTE connections, comes next with 66% of respondents. Other connectivity services or modes of connection that are usually enabled by users include GPS (25%), Bluetooth (20%), sensors such as motions and light (5%), and NFC connections (3.5%). On the positive side, these modes of connection can provide data that may feed into decision and policymaking. However, they do also increase the likelihood of privacy or security breaches for individuals if no sufficient technological or legal precautions are put in place. These findings may suggest that increasing the potential of harnessing personal IoT devices as sources of societal big data in policymaking can be better achieved if large-scale Wi-Fi coverage is available. Alternatively, if the coverage and cost of mobile data connectivity is made affordable across the region this potential will increase as well.

Connections or Services Usually Activated on Your Phone, Tablet or other Internet-enabled Devices You Use

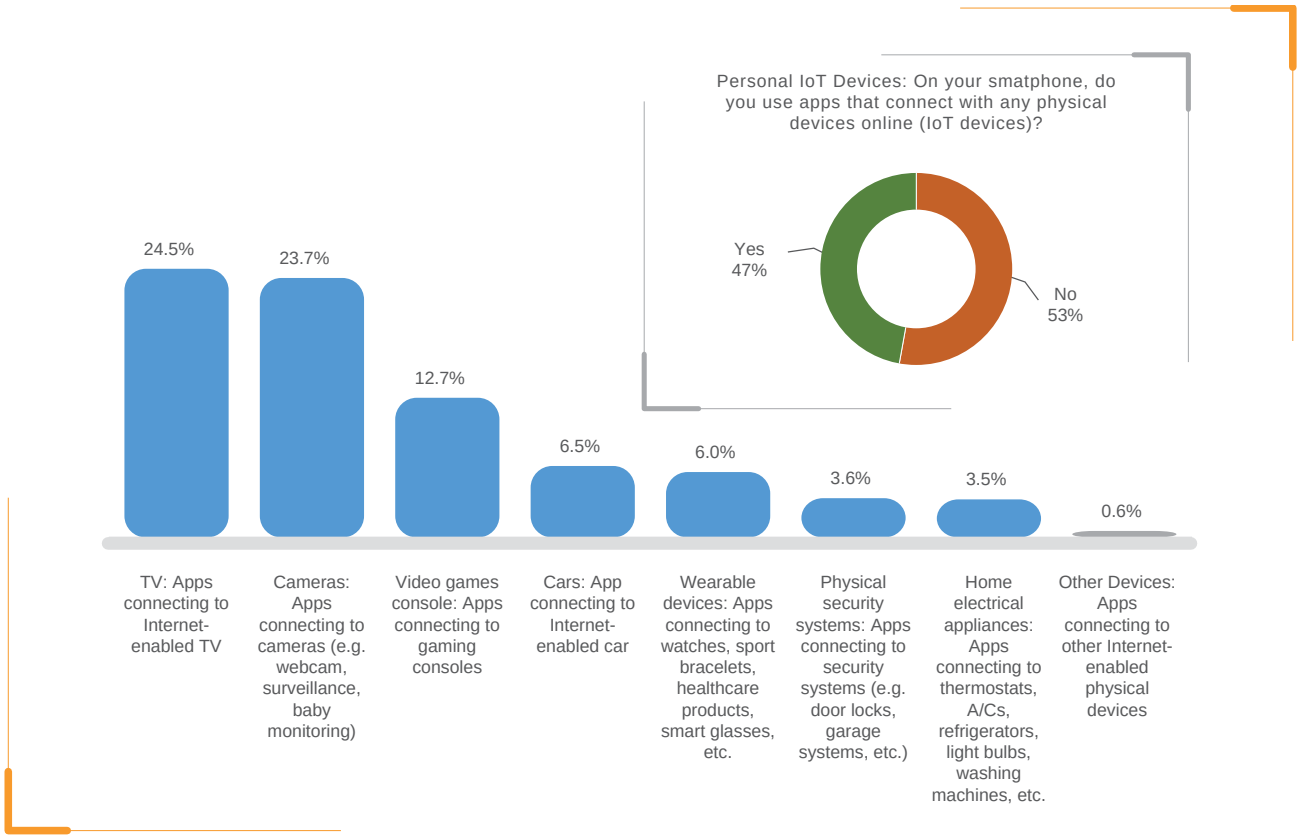


IoT-to-Mobile Connectivity

Interactivity between IoT devices and human beings is facilitated through different Internet-enabled mediums, such as computers, control panels and mobile devices. The primary interface or medium of interactivity between people and IoT devices is the smart phone. More specifically, this takes place through specifically-developed software applications (or apps) installed on the smart phones and designed to control or interact with physical IoT devices. Likewise, mobile apps are also the primary medium for interaction between physical devices and social media accounts.

According to our survey respondents, use of mobile apps to interact with IoT devices in the region is widespread. Around half of the respondents in our survey (47%) said that they use apps on their smart phones that interact with physical Internet-enabled devices. This highlights a growing convergence between human social networks and IoT devices in the region, mediated by smart mobile apps. However, which IoT devices do most people interact with through mobile apps? Entertainment IoT devices have the largest share according to our survey. Internet-enabled televisions, cameras and gaming consoles are the top three IoT devices that people interact with through mobile apps (25%, 24% and 12% respectively). This is followed by internet-enabled cars (6.5% of respondents), wearable IoT devices (6%) and security devices (3.6%) and connected home appliances (3.5%).

Personal IoT Devices: Which of the Following Physical Devices do You Connect with Online through Apps Installed on Your Smart Phone?



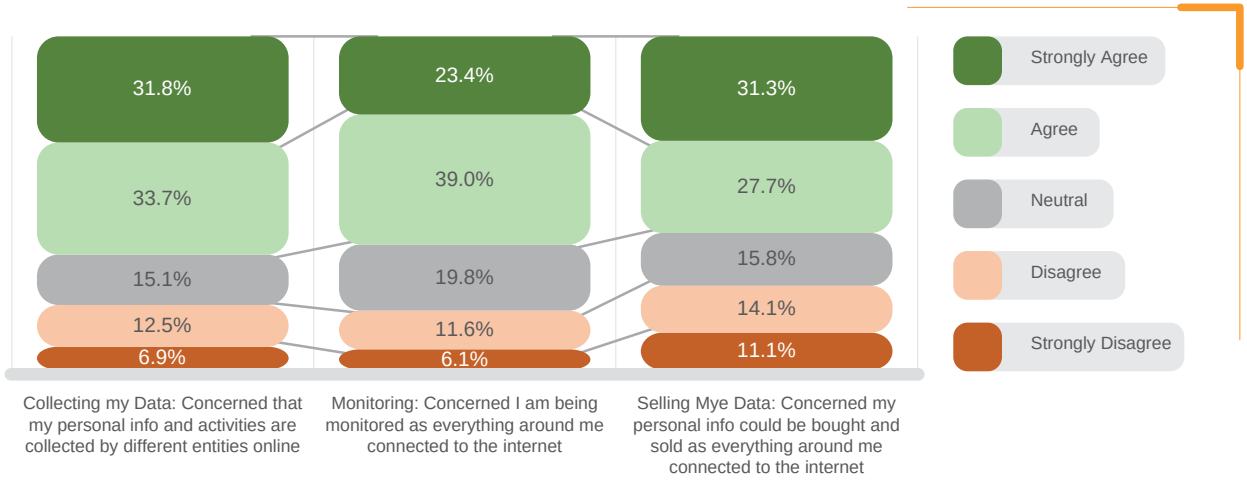
Data derived from mobile phone triangulation is already used as a rich data source by mobile service providers, as well as certain government authorities in the region. These findings provide a snapshot of people's modes of connectivity in the region, their preferences and behaviors. Coupled with other sources of behavioral and usage data, these sources can help inform decisions on utilizing IoT and social media data for public engagement and policy development. As the volume and uptake of personal IoT devices increase in the region, expanding the utility of this big data source will rely on many regulatory, economic and infrastructural factors, which remain limited. However, the use of such data is still limited and restricted in scope, and provides a partial and fragmented digital picture of society.

Public Concerns on IoT in the Arab Region

In addition to the limitations highlighted above, public concerns about the use of IoT data by government are widespread. The majority of respondents in our survey are concerned about their personal data and activities being collected by different entities online (65% agree or strongly agree and 19% disagree or strongly disagree). Similarly, people in our survey are also concerned about monitoring and surveillance with increased connectivity of everything (63% agree or strongly agree) and 59% are concerned about their personal data being used for commercial uses by different entities, such as selling or buying personal data (25% disagree or strongly disagree).

While these views and concern differ from one country to another, a majority of people in the region are still living either in countries with under-developed IoT infrastructure or in rural areas with limited connectivity, these findings highlight certain concerns that may expand with the increased introduction of IoT infrastructure across the region.

Public Concerns about Internet-Connected Things in the Arab Region



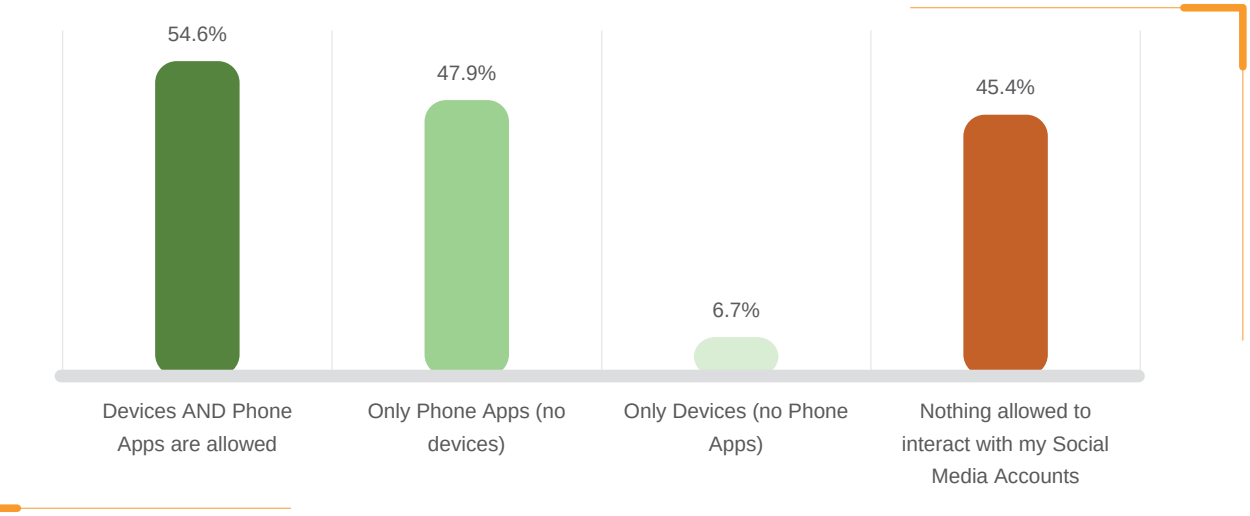
1.3. The Convergence of Social Media and IoT Data - Potential, Limitations and Concerns on Big Data for Public Policy

The previous sections highlighted the potential, limitations, and concerns about using either social media or IoT separately in policymaking according to our regional survey. The findings presented in the previous sections suggest that: 1) there is a potential for increasing the uses of big data in policy making in the region, both from social media and IoT sources, 2) that there are potentially a number of limitations facing data-driven policymaking, which are specifically related to the diverse cultural, social and political contexts of the Arab region, and 3) that there are wide-spread concerns among the public in terms of using personal data through social media or IoT by governments and businesses. This however, is also coupled with a healthy level of awareness about the risks. In this section, we explore the potential, limitations and concerns relating to the convergence of social media and IoT data as big data sources for policy formulation.

The State of IoT and Social Media Interaction in the Arab Region

The lines between the virtual and physical are blurring rapidly. Social media accounts and IoT devices are interacting either by themselves or through human mediation. Home appliances are updating Facebook status, banking apps are operated by tweets and personal cars are controlled by social media accounts and posting social media updates. In other words, alongside their human owners, social media accounts are increasingly being inhabited by pieces of software, such as IoT-driven “bots”. Likewise, internet-enabled devices are increasingly being operated, updated or triggered by social media activities. Within this context, what are the usage habits of social media and IoT devices in the region?

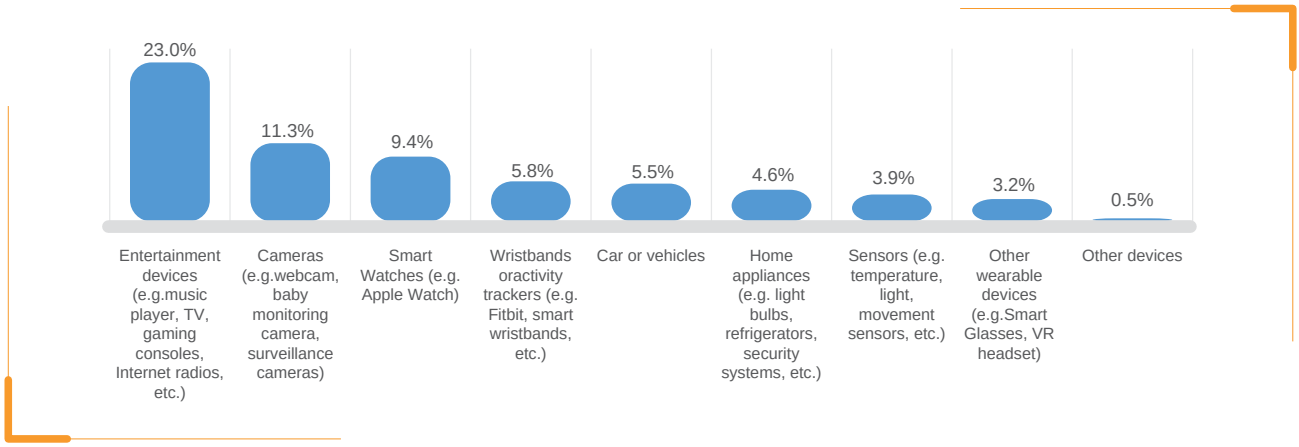
Do You Usually Allow any Devices or Apps to Connect with Your Social Media Accounts?



Around 45% of respondents around the region said that they don't allow any interactions to take place on their behalf with their personal social media accounts. However, more than half of the respondents (55%) said that they do allow their social media accounts to interact with physical devices and software apps they use (like phones, Internet-enabled appliances, wearables, connected cars, etc.). This includes software apps installed on smart phones as well as physical devices owned by users. The majority of those who allow interactions to take place with their social media accounts (48% out of 55% of total respondents) said that they only allow apps on their phones or devices to do so. Those who allow interaction between physical IoT devices and their social media accounts are around 7% of respondents.

What IoT devices do people in the Arab region usually allow to connect with their social media accounts? As with the general trend on the use of Internet-enabled devices in the region highlighted in previous questions, the largest portion of respondents who said that they allow such interactions, do so with entertainment devices (such as music players, cameras, TVs, etc.) This is followed by cameras, smart watches, wristbands and cars.

What Internet-enabled Devices do Usually Allow to Connect with Your Social Media Accounts?



Towards Inclusive Data-Driven Public Policy: Addressing Public Concerns on Big Data in the Arab Region

Previous findings demonstrate a broad spectrum of public concerns about practices affecting personal data generated by social media and IoT devices. Based on the findings, the survey also explored public perceptions regarding potential policy responses to these concerns. From the citizen's viewpoint, when governments or businesses try to harness personal data to extract meaning, the key concerns are related to loss of control, breaches of privacy, and misrepresentation or misuse of data. These concerns are understandably justified in the era of big data and data-driven governance. The survey respondents were presented with a set of possible scenarios and responses to assess public acceptance of each policy response. What policy responses can be taken to ease public concerns about big data related to social media and IoT?

From the citizen's viewpoint, when governments or businesses try to harness personal data to extract meaning, the key concerns are related to loss of control, breaches of privacy, and misrepresentation or misuse of data.

Based on the survey findings, possible policy responses can be categorized in three main groups: 1) transparency, 2) user control of data, and 3) data-related regulations. Relatively large percentages of the survey respondents said that each of the following would provide them with enough assurances or make them less concerned about their personal social media or IoT data being collected, retained and analyzed by governments or businesses:

I - Transparency: The top two potential policy responses that respondents said would make them less concerned about the use of their personal data by government and businesses are related to transparency measures: What and who; ability to know what data is collected, and ability to know who has access to the data. The following are the possible transparency-related policy responses people supported in the Arab region:

a. **Knowing What Data:** If the user was given the right to know exactly what data is collected and retained about them through social media and IoT devices

b. **Knowing Who Can Access the Data:** If users were given a list of entities (companies or government agencies) that may have access to personal data generated by social media or Internet-connected devices.

c. **Getting the Data:** If users can get a complete copy or download all personal data collected through social media Internet devices.

d. **Mapping IoT:** If public maps about the locations of sensors and cameras are available, with regards to IoT devices such as sensors and cameras. This may be important in easing concerns with regards to smart cities developments.

II - Control:

a. **Ability to Remove Data:** Users ability to remove personal data from government or commercial data repositories was one of the top three responses highlighted by respondents as a measure to ease their concerns across the region.

b. **Consent:** Prior explicit user consent on what may be done with the personal data collected was highlighted as an important factor that can make people less concerned. This was the only possible policy response that more respondents supported for IoT data than for social media data.

c. **Approving Who Uses the Data:** If users have the ability to approve and control which sectors can use their social media or IoT personal data then that will make it more likely for more people to share data (e.g. only educational uses, research, public health, NGOs, government, etc.)

III - Regulations:

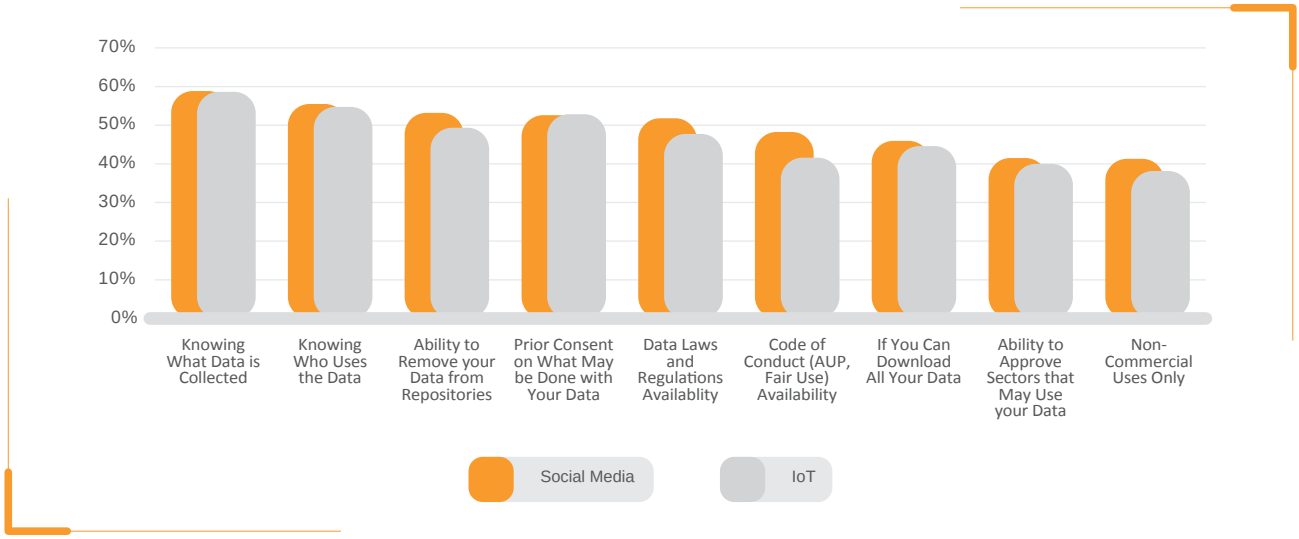
a. **Data Laws:** Availability of regulatory frameworks and appropriate data laws and regulations that protect the personal data of individuals when such personal data is used in policymaking.

b. **Code of Conduct:** Availability of clear “fair use” policy, “ethical framework” or other acceptable-use policy (AUP) can ease public concerns and influence willingness to share personal their data.

c. **Certified privacy policies:** If the privacy and data policies applied are approved or certified by independent standards body (e.g. academic board, non-government expert committee, etc.)

d. **Anonymization:** If there are regulations forcing entities to anonymize personal data or delete any data that identify individuals.

Which of the Following Would Make You Less Concerned About Use of Personal Data by Governments or Businesses through IoT Devices or Social Media?



In addition to the policy responses above, the survey findings highlight the following two important points:

Views on Personal Data: Regardless of the medium, personal data is viewed in the same light with regards to possible responses. Respondents around the region had almost identical views on possible responses to their concerns, regardless if the personal data in question was captured from their social media accounts or through IoT devices they use or interact with.

Public Mistrust: Overall, there is no single possible response that gained universal acceptance around the region. This may relate to the uncertainty around the uses of personal data harnessed through social media and IoT. It also may imply limited confidence or trust by the public in the region that any of the possible responses can ease their concerns about their data being misused. For example, as a possible policy response to ease public concerns, anonymization of data received the least number of positive responses, which may indicate limited public trust in the capacity or willingness of government entities to enforce such measure.

As a possible policy response to ease public concerns, anonymization of data received the least number of positive responses.

Finally, big data presents numerous promises for public policy development. However, data-driven policymaking also raises a wide range of concerns. The findings of this regional survey demonstrated a broad spectrum of public concerns about personal social media and IoT data in the Arab region. As tools of digital governance mature, social media and IoT data promise to enhance data-driven policymaking. If such opportunities are to be harnessed in the region, the policy responses discussed here need to be examined contextually to help address and ease such concerns.

Way Forward: The Future of People, Social Media and IoT Networks

As will be demonstrated in the next section of the report, social media adoption in the Arab region continues to grow across the board. The behaviors and trends point towards convergence between social media and Internet-enabled devices. This presents a new frontier for data-driven policymaking as well as a wider horizon of concerns. However, as the Arab region continues to adopt Internet technologies, will this trend continue going forward?

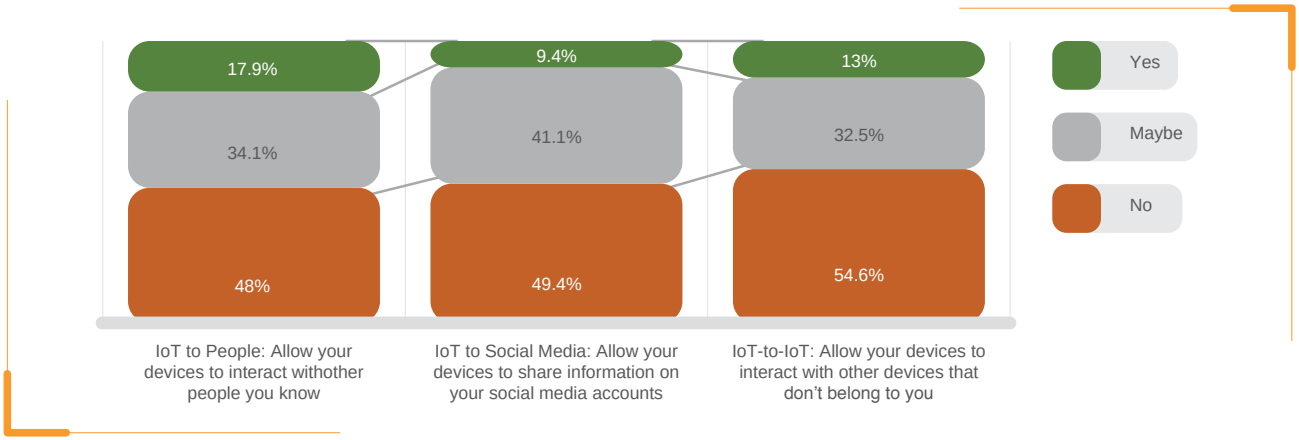
IoT devices form physical hierarchies and social networks on their own. They also converge with other hierarchical or human social networks to form a hybrid network of devices and people, in their virtual or physical being. Kept separated, the two networks of 1) human social connections, digitized and "datafied" through social media technologies and platforms, and 2) physical network of IoT devices, may serve complimentary purposes. However, by converging in a hyper-connected digital world, they provide unlimited possibilities, as well as raise numerous concerns and unimaginable risks. The convergence of IoT devices and social media is creating new opportunities for data-driven policymaking. The big data generated by massive networks of IoT devices and social media networks can provide an unprecedented granular and nuanced picture of society. They can also enable wide-scale security breaches, erosion of privacy, mass surveillance, among other risks.

The boundaries are rapidly blurring between the individuals' physical being in real-life, their presence within the virtual social media realm and their interaction with the physical network of Internet-enabled objects. People, social media accounts and IoT objects are interacting heavily and generating unprecedented amount of data. With regards to data, these three networks, the real-life social network of people, the virtual social network of social media users and accounts, and the "social network" or hierarchy of interconnected IoT objects, are becoming one.

Based on these trends, we asked respondents about future tendencies and the ways of interaction between these three networks, people, social media and physical IoT devices. According to our survey, a clear majority of people is hesitant about allowing increased connectivity between these three networks in the future. Around 48% of respondents said that they would not allow their IoT devices to interact with other people they know (only 18% said they would). Similarly, around 50% said that in the future they would not allow IoT devices to share data with social media accounts (10% said they would). The type of interaction that received the largest negative response was IoT-to-IoT (or machine-to-machine) interactions. Around 55% of respondents said that in the future, they will not allow internet devices they own to interact with other internet devices (13% said they would). Of course, these responses imply that people have a level of control on such interactions in the future, which is one of the critical policy questions as the world becomes ever more connected.

The survey also highlights an obvious level of uncertainty about how people will react as these changes continue to emerge. Around a third of respondents on average, were not sure about how they will react in the future with regards to interactions between people, social media and IoT. These findings provide insight into levels of public readiness for the next phase of the data-driven revolution.

In the Future, Would You Allow the Following Kinds of Interactions Between Your Social Media Accounts and Internet-enabled Devices and Objects?



Finally, this new hybrid universe of connected humans and devices require further multidimensional and multi-disciplinary research and policy responses. This report provides an in-depth exploratory look into the possibilities, limitations and public concerns of two key sources of big data in the Arab region. The findings can hopefully increase public awareness and inform policy responses while the region embraces "smart" government and smart city approaches as routes towards building future governance models.

2.

Mapping Social Media in the Arab World: 2010-2017

Over the past six years, the Arab Social Media Report series has been providing in-depth analysis on social media trends, growth and demographic breakdowns across 22 Arab countries. During this period, the findings of the series highlighted critical emerging transformations taking place on a regional level. The series has also been informing regional and international policy formulation, strategic business decisions and scholarly discourse related to development, socio-economic policy, and digital governance and its associated transformations in the Arab region.

The 7th edition of the Arab Social Media Report continues to explore the growth and influence of key social media platforms in the Arab region. It follows from the previous six editions in covering the growth and usage trends of Facebook, Twitter and LinkedIn in the region as some of the most widely used platforms in their respective categories. However, for the first time, this edition also explores usage trends related to Instagram, one of the fastest growing photo-sharing social media platforms in the region.

This section of the report provides a detailed view of the changes on the social media horizon in the Arab World since the previous edition of the report. In addition, it puts the changes over the past two years in context by mapping key elements of the growth trends in the Arab region in the period between 2010-2017. The data presented in this section on demographic breakdowns, such as age, language and gender were collected periodically for all 22 Arab states between January 2016 and January 2017. This was combined with over-time growth data which was collected periodically between 2010 and 2017 as part of previous editions of the Arab Social Media Report series.

Social media in the Arab world is gaining more ground, growing increasingly localized, becoming less youthful, while remaining a male-dominated medium.

In addition to the regional survey, this updated in-depth analysis of social media transformations expands the coverage and scope of the series, with the objective of enriching our understanding of the cross-societal and citizen-government interactions in the region. The findings of the 2017 edition of the Arab Social Media Report highlights strong and continued growth of social media uptake and influence across Arab societies. Overall, the findings of this edition indicate that social media in the Arab world is gaining more ground, growing increasingly localized, becoming less youthful, while remaining a male-dominated medium.

Global Social Media Highlights:

- **Facebook[6]:** Facebook remains the most popular social media platform globally. By the third quarter of 2016, it had 1.79 billion monthly active users, an increase of 16% since 2015. Out of those, 1.66 billion people use the platform through mobile devices monthly, an increase of 20% year-over-year. Approximately 85% of those who use Facebook daily are outside North America.
- **Twitter[7]:** By the third quarter of 2016, Twitter had 317 million monthly active users around the world, a 3% increase over 2015. Out of those, 85% are actively using the platform on their mobile phones. The majority of Twitter users (79%) are based outside the US.
- **LinkedIn[8]:** Almost 467 million people have LinkedIn accounts, an 18% growth since 2015. Out of those users, 106 million are active on monthly basis and around 65 million of them use the platform through their mobile devices.
- **Instagram[9]:** Instagram has 300 million active users globally, primarily used through mobile devices.
- **Youtube[10]:** Over one billion people use Youtube, half of them using their mobile devices.

Social Media in the Arab Region

The following is a snapshot of some key findings from the 2017 edition of the Arab Social Media Report:

- **Arabic Language:** Arabic language use on social media has increased substantially during the past two years in the region. For the first time ever, the Arabic language is now used in a majority of social media activities in the Arab region. On average, the rate of using Arabic language in social media activities stands at 55%, up from 43% two years ago on Facebook, while 72% of all tweets in the region are now posted in Arabic.
- **Language by Region:** In terms of language use on a regional level, North African countries witnessed the strongest growth of Arabic language use over social media during the past two years. In contrast, the rates of using Arabic language on social media in all six Gulf countries have dropped during the past two years.

For the first time ever, the Arabic language is now used in a majority of social media activities in the Arab region.

- **Youth:** Social media users in the region remain largely youthful. On average, 64% of social media users in the region are under 30 years old. However, this percentage has slightly, but consistently, decreased over the past six years where early adopters of social media in the region are maturing.
- **Age Balance:** Compared to the rest of the Arab region, the Gulf countries largely have more balanced age breakdowns of young users who are under 30 and those who are over 30 years old, indicating maturity of usage across age groups in society.

6. Facebook 2016: http://www.fb.com/
7. Twitter 2016: http://www.twitter.com/
8. LinkedIn 2016: http://www.linkedin.com/
9. Instagram 2016: http://www.instagram.com/
10. YouTube 2016: http://www.youtube.com/

- **Gender Gap:** The gender gap persists among Arab social media users with only 1 out of 3 social media users being female at best, which is lower than the global average. This imbalance has remained almost unchanged over the past six years.
- **Regional Gender Balance:** On a regional level, only 1 out of 4 users in the Gulf region is a woman (24.6%), compared to 1 out of 3 in the other parts of the Arab region on average (32.3%). The North Africa region has a slightly better gender balance of social media users compared to the Arab average, with more than 36% of users being females.
- **Gender-Balance Per Platform:** The ratio of women to men in the region is almost identical on Facebook and Twitter (1 to 3). Meanwhile, career-focused social media platforms such as LinkedIn has lower percentage of women among its users.
- **Best and Worst Countries on Gender Balance:**
  - **Facebook:** Palestine has the best gender balance on Facebook, Oman has the worst.
  - **Twitter:** Bahrain has the best gender balance on Twitter, Yemen has the worst.
  - **LinkedIn:** Lebanon has the best gender balance on LinkedIn, Saudi Arabia has the worst.
- **Regional Penetration rates:** The Gulf countries largely dominate the top five spots in terms of penetration rates of key social media platforms among their populations, including Facebook, Twitter, LinkedIn and Instagram.

2.1 Facebook in the Arab World 2010-2017

Highlights - Facebook in the Arab Region

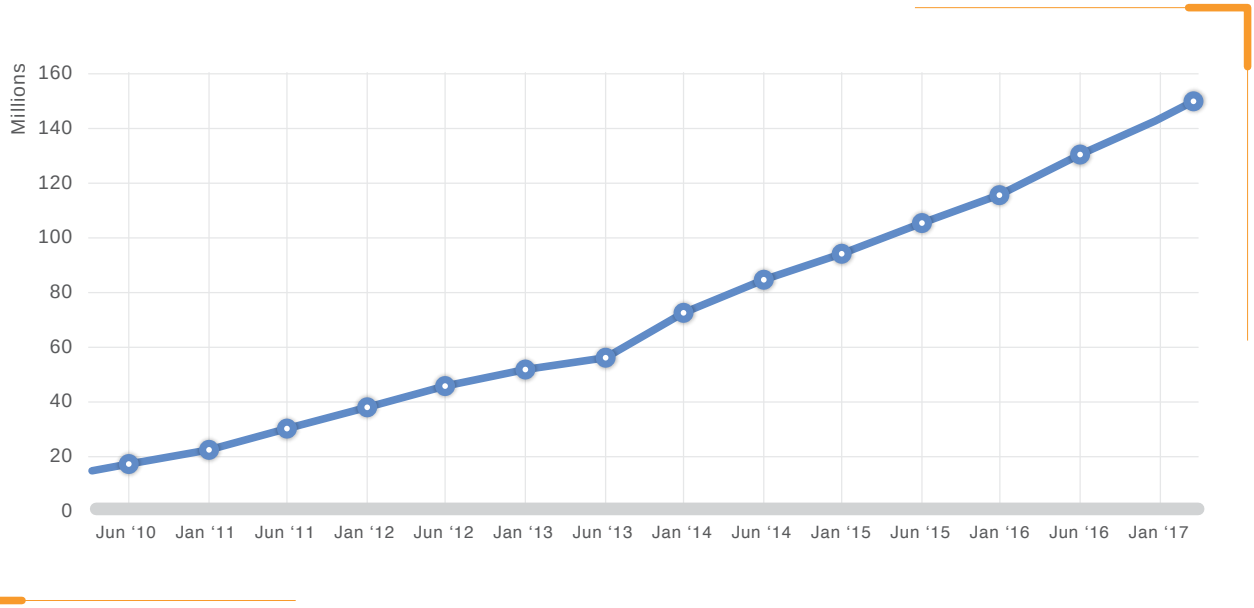
- **Most Popular:** Facebook is by far the most popular social media platform in the region with around 156 million users by early 2017, up from 115 million a year earlier.
- **Growth:** Overall, the number of Facebook accounts in the Arab region has more than doubled over the past three years.
- **Regional Penetration:** By early 2017, the penetration rate of Facebook accounts among the Arab population in the region stands at 39%, up from 28% a year earlier.
- **New Users:** Over the past two years, the largest growth in terms of number of new users joining Facebook was in Egypt (14 million), followed by Algeria (9.4 million) and Iraq (7.3 million).
- **Penetration growth:** Between 2014 and 2016, penetration rates of Facebook grew by 11.4 percentage points per country on average in the Arab region. The four countries of Qatar, UAE, Algeria and Libya grew by more than 20 percentage points each.
- **Users Activity:** One out of three persons in the Arab region owns a Facebook account. However, 1 out of 5 persons uses that account on daily basis.
- **Top Countries:** In terms of penetration rates, Qatar and the UAE have, by far, the highest penetration rates of Facebook accounts, with almost 95% penetration rate in each country. They have a 20-point lead over Bahrain (ranked 3rd), which is followed by Kuwait and Jordan.
- **Largest Share:** In terms of distribution, around half of all Facebook users in the Arab region are based in three countries: Egypt, Saudi and Algeria. Around 23% of all Arab Facebook users are in Egypt alone.

- **Most Active Countries:** Qatar has the most active users on daily basis, out of all Facebook users in the country, followed by the UAE and Tunisia. Users in Yemen are the least active daily.
- **Most Active Region:** Overall, users in the Gulf region are the most active daily. Almost 2 out of 3 persons living in the Gulf region own a Facebook account; and 1 out of 3 persons uses that account on daily basis.
- **Youth:** Around 64.3% of Facebook users in the region are under 30 years old, dropping from 67% two years earlier, and from 70% in 2012. There is a slow, but steady, uptake of Facebook by users over the age of 30 in the region.
- **Women:** The percentage of female users of Facebook remains persistently lower than the global average. By 2017, only 32.3% of Facebook users in the Arab region are women.

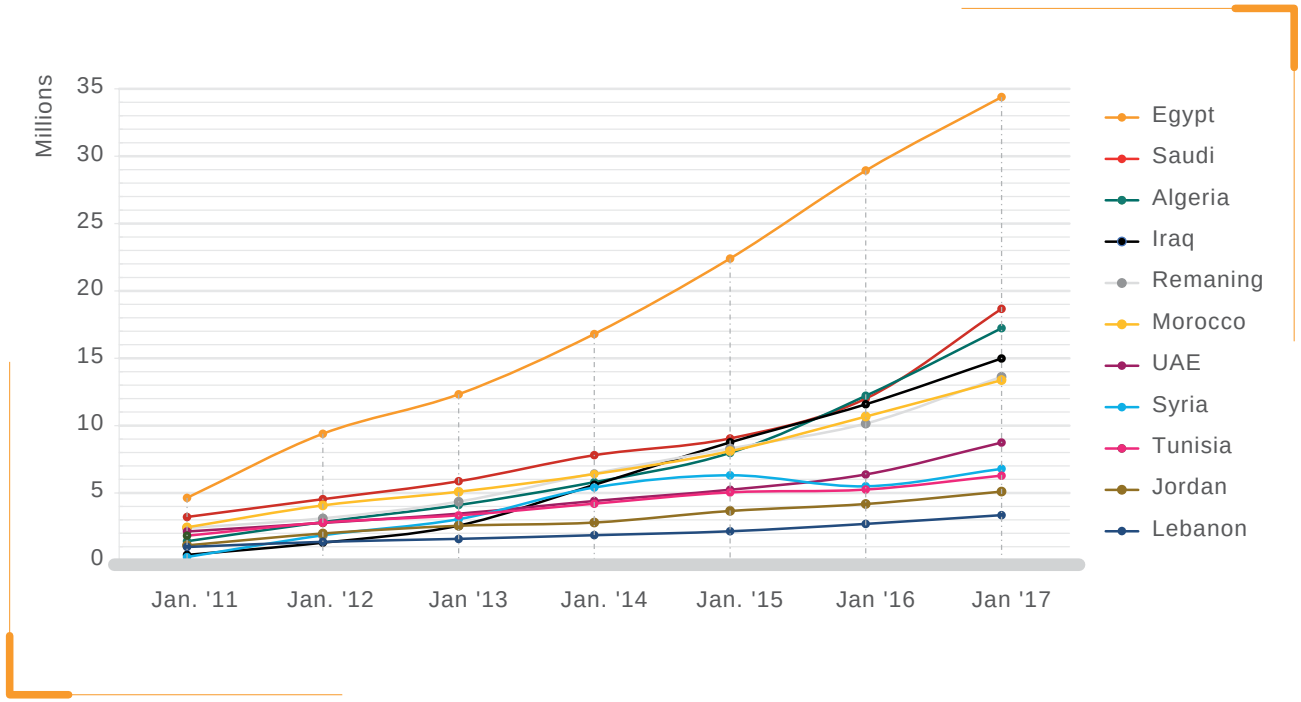
2.1.1. Facebook Growth and Penetration Rates in the Arab Region

Facebook remains the most popular social media platform in the Arab region by a far margin. Collectively, the number of Facebook users in the Arab region has steadily increased over the past six years as per the findings of the Arab Social Media Report series, reaching more that 156 million in 2017. This number represents a year-on-year increase of close to 41 million, up from 115 million in the beginning of 2016. Individually, the growth rates in several countries fluctuated over this time period, influenced by multiple political, societal and economic factors. For example, after the popular uprising in Egypt in 2011, there was a noticeable increase in growth rates of Facebook users in the country, as the public, the government and political powers increasingly used social media as a communication, mobilization and engagement medium. The growth rate—while still moving upwards—slightly slowed down starting 2013. In contrast, military conflicts in other countries in the region, have negatively affected the growth rates of social media during different phases of the conflicts. In Syria, Yemen and Palestine there were noticeable slumps in social media growth trend at multiple points over the years, which seem to coincide with intensifying levels of the conflict in each country. Meanwhile, market changes in other countries, may have affected social media growth, and Facebook growth specifically. For example, Algeria's Facebook adoption rates increased fastest in 2015-2016, where increased Internet access and more competition in the telecommunication market may have had an effect. These observations highlight potential areas for additional research on the impact of political, economic and societal dynamics on social media adoption and uses, and vice versa.

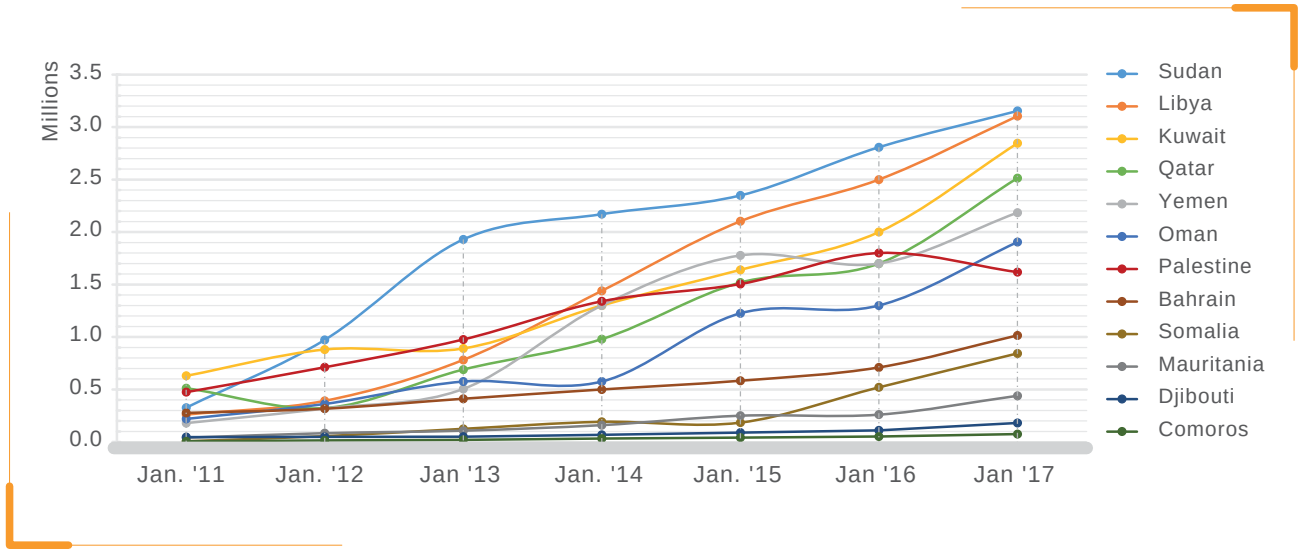
Growth of Facebook Users in the Arab Region between June 2010 and Jan 2017



Growth of Facebook Users in the Arab States (Top 10 Facebook Populations - Jan 2011 to Jan 2017)



Growth of Facebook Users in Remaining Arab Countries (Excluding Top 10 Facebook Populations - Jan 2011 to Jan 2017)

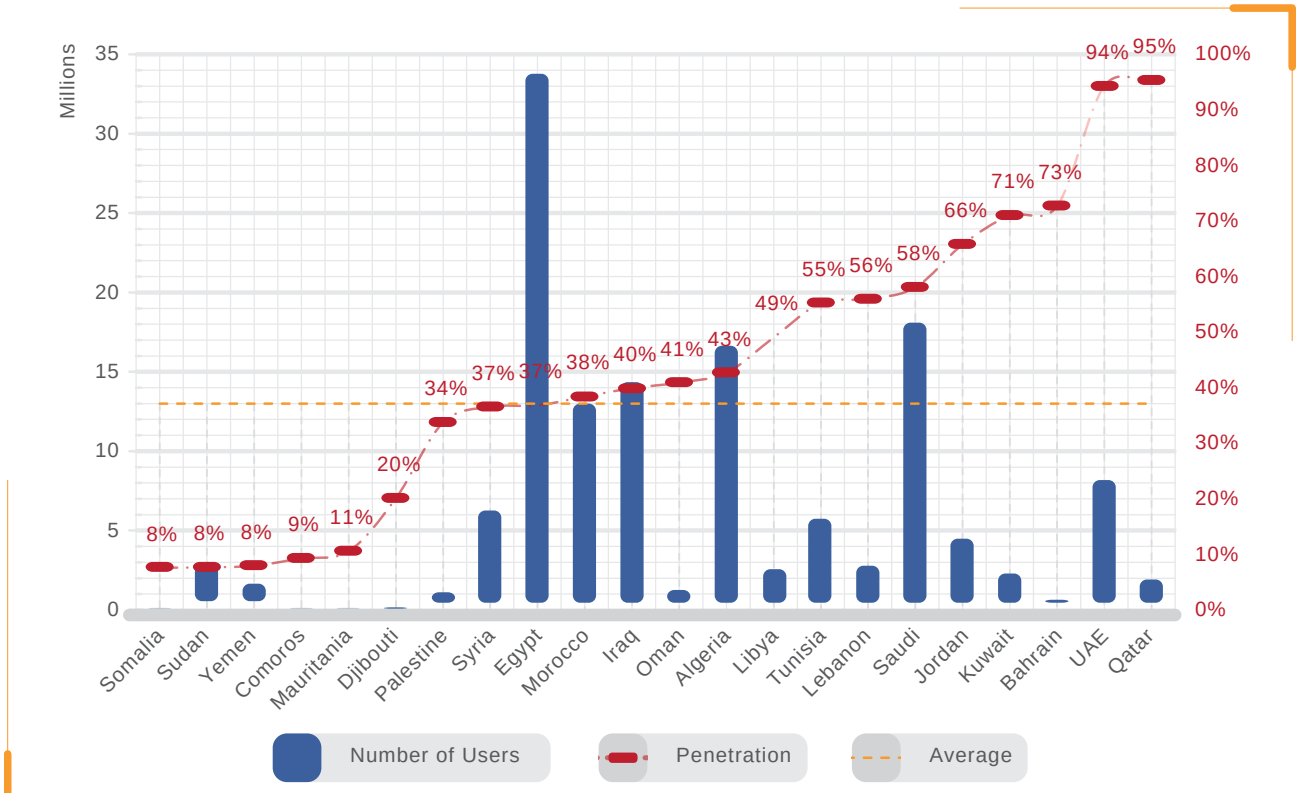


In terms of the actual accounts, the average number of Facebook accounts per country stands in 2017 at 6.7 million account. In 7 out of 22 Arab countries the number of Facebook accounts exceeds the regional average. These countries are: Egypt, Saudi, Algeria, Iraq, Morocco, UAE and Syria. Egypt still leads by far in terms of number of Facebook users with close to 34.5 million accounts.

In terms of penetration rates of Facebook accounts, the regional penetration rate of Facebook accounts stands at 34% on average. The majority of countries are above the regional average with Qatar and the UAE remaining in the lead and crossing the 90 penetration rate for the first time. The two countries have almost identical penetration rates of almost 95 percent. This is more than 20

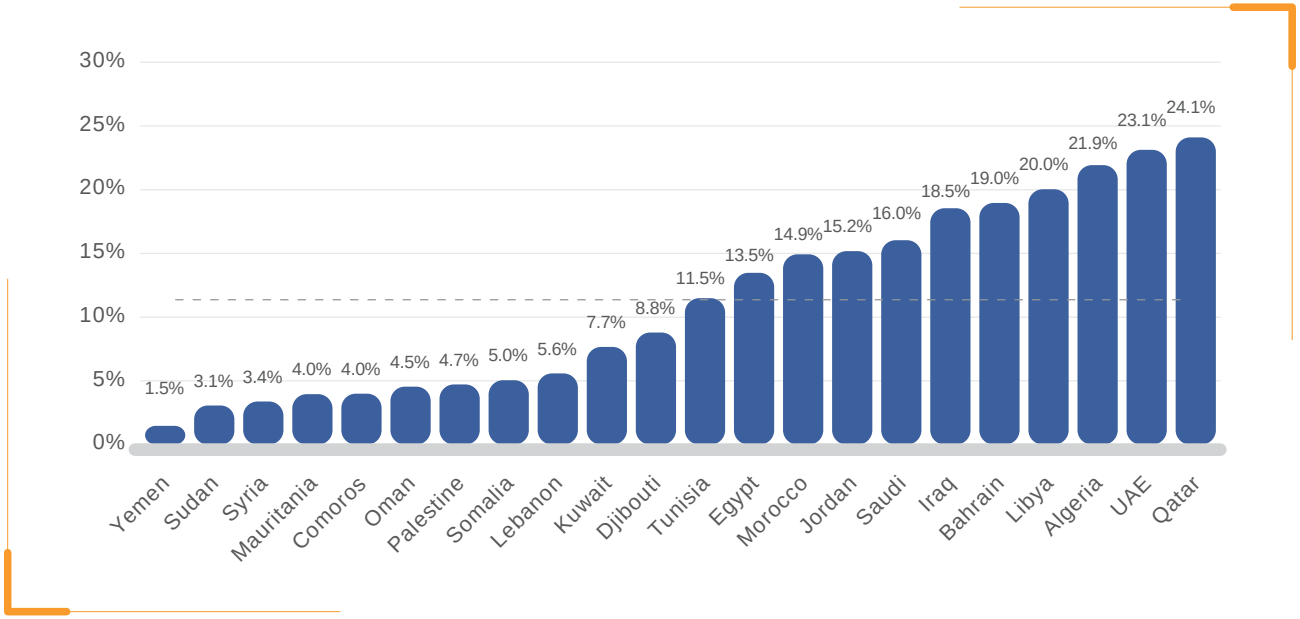
percentage points above Bahrain, the next country on the rank in terms of penetration rate. Overall, the eight countries of Qatar, UAE, Bahrain, Kuwait, Jordan, Saudi, Lebanon and Tunisia have more than 50% penetration rates of Facebook accounts in each country. Meanwhile, the four countries of Comoros, Yemen, Sudan and Somalia have less than 10% penetration rates. The pace of change in penetration rates of Facebook accounts is another measure indicating growth. Qatar, UAE, Algeria and Libya each has seen an increase of more than 20 percentage points in penetration rates of Facebook accounts during a period of 30 months between June 2014 and January 2017.

Penetration of Facebook Accounts (and number of accounts) in the Arab States in 2017

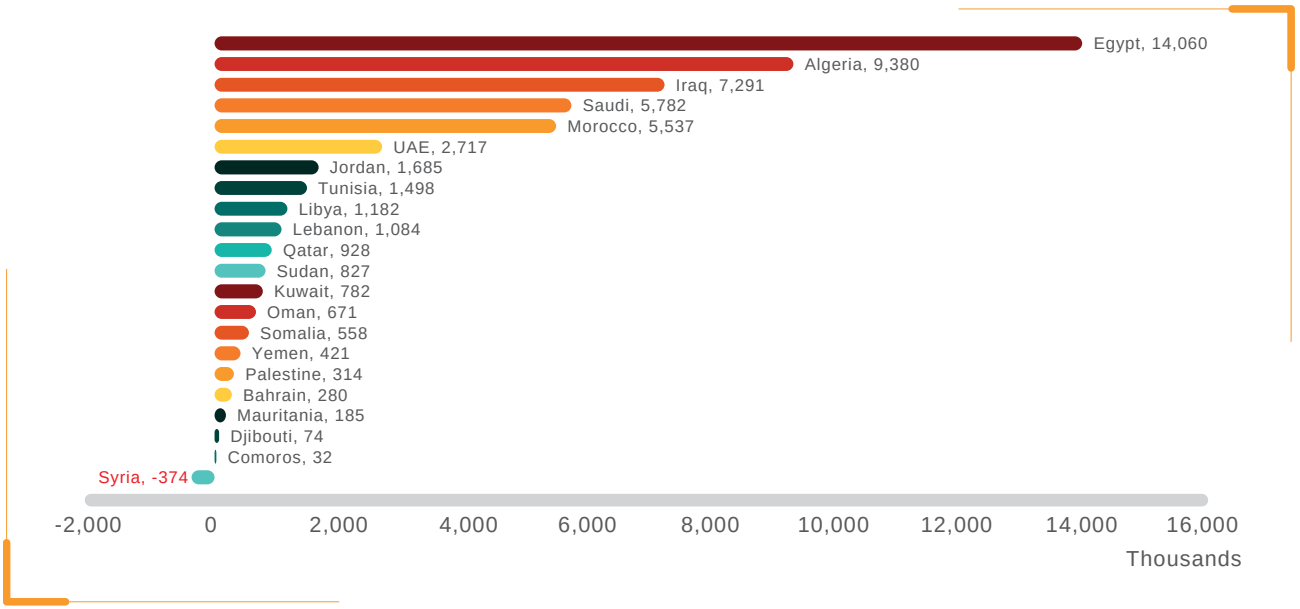


Change in Country-level Penetration Rates of Facebook in the Arab States

(between 2014 and 2017)



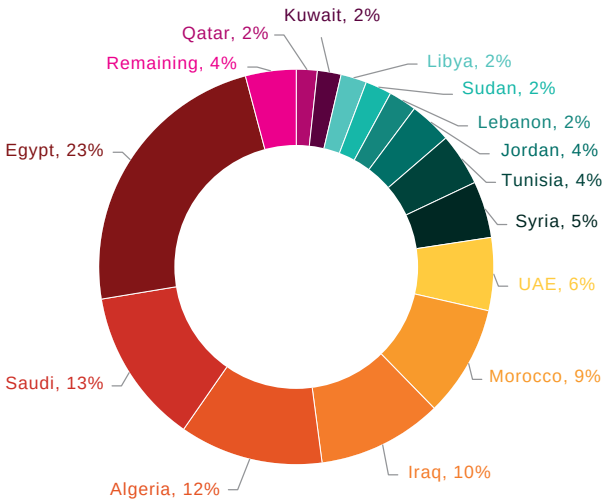
Changes in Numbers of Facebook Users in the Arab States (between 2014 and 2017)



Egypt gained more than 14 million new users during this 30-month period, followed by Algeria, gaining 9.3 million new users, then Iraq (7.2 m), Saudi (5.7 m) and Morocco (5.5 m). During this period, all Arab states, excluding Syria, saw an increase of number of Facebook users in the country. Syria presents a curious case, where the number of Facebook users in the country has decreased by around 375 thousand during this period, while penetration rates have increased. This is due to the mass population exodus and forced migration of millions of people out of the country, pushed by the intensifying military conflict between 2014 and 2016, which has resulted in a cumulative drop of at least 11 percent of the population during the length of the conflict[11].

As of early 2017, around 23% of Facebook users in the Arab region were based in Egypt, a percentage that has decreased slightly from 25% over the past five years. Saudi Arabia continues to increase its share of Arab users, rising by 3% from 2014. However, the rising star in terms of largest increase of share was Algeria, which gained 4% of the total share of Facebook users in the region. By 2017, 12% of the total users in the region are now based in Algeria. The remaining countries in the region largely maintained their share of the total Facebook users in the Arab region with slight fluctuations.

Distribution of Facebook Users in Arab Region (2017)



11. Population and immigration estimates are based on data from the United Nations Department of Economic and Social Affairs: Population Division and UNESCO Institute for Statistics 2016

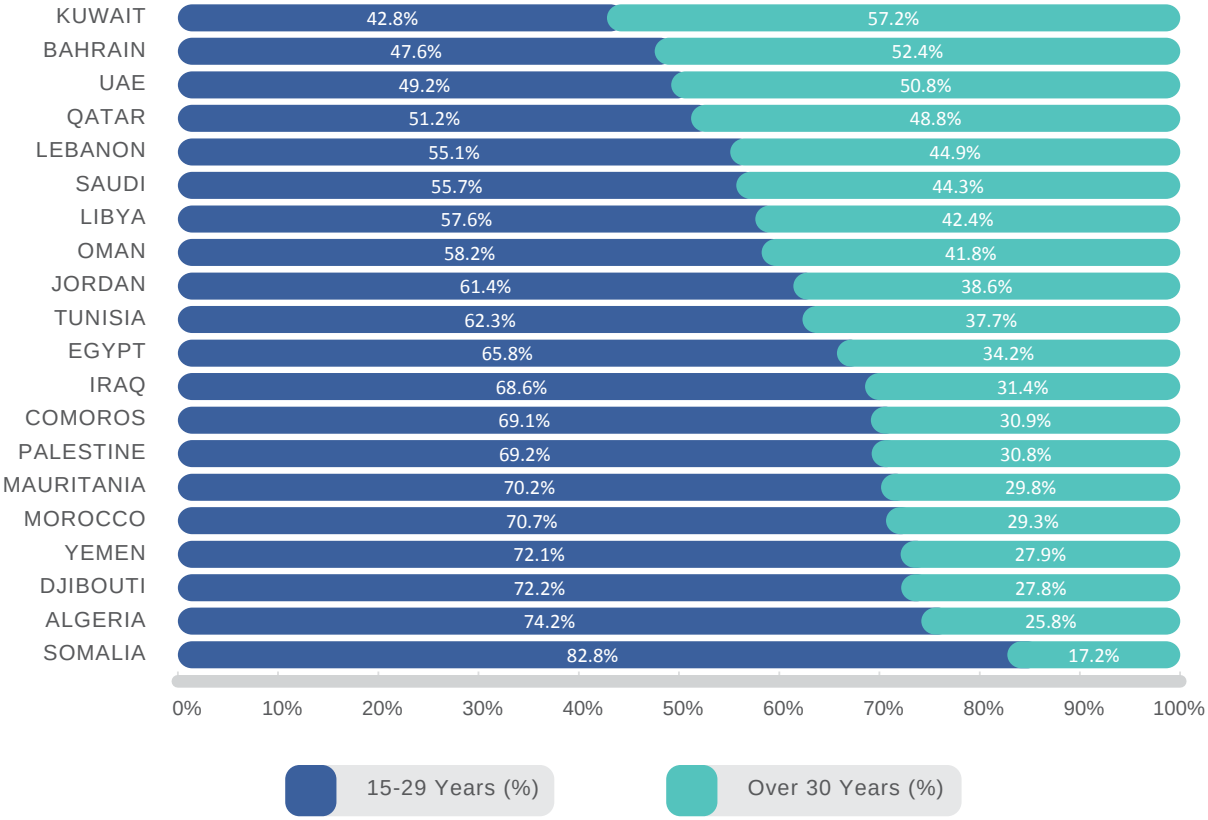
2.1.2. Gender and Age Breakdowns of Facebook Users in the Arab Region

Social media users in the region remain largely youthful; this is a consistent finding over the past six years. On average, 64.3% of Facebook users in the region are now under 30 years old. However, this percentage has consistently witnessed slight dips over the past years. It went down from 67% two years ago, and from 70% in 2012. While Facebook users in the Arab region remain mostly youthful, the trend is moving towards a more balanced age breakdown in the region. During the past six years, there was a slow, but steady, uptake of Facebook by users over the age of 30.

During the past six years, there was a slow, but steady, uptake of Facebook by users over the age of 30.

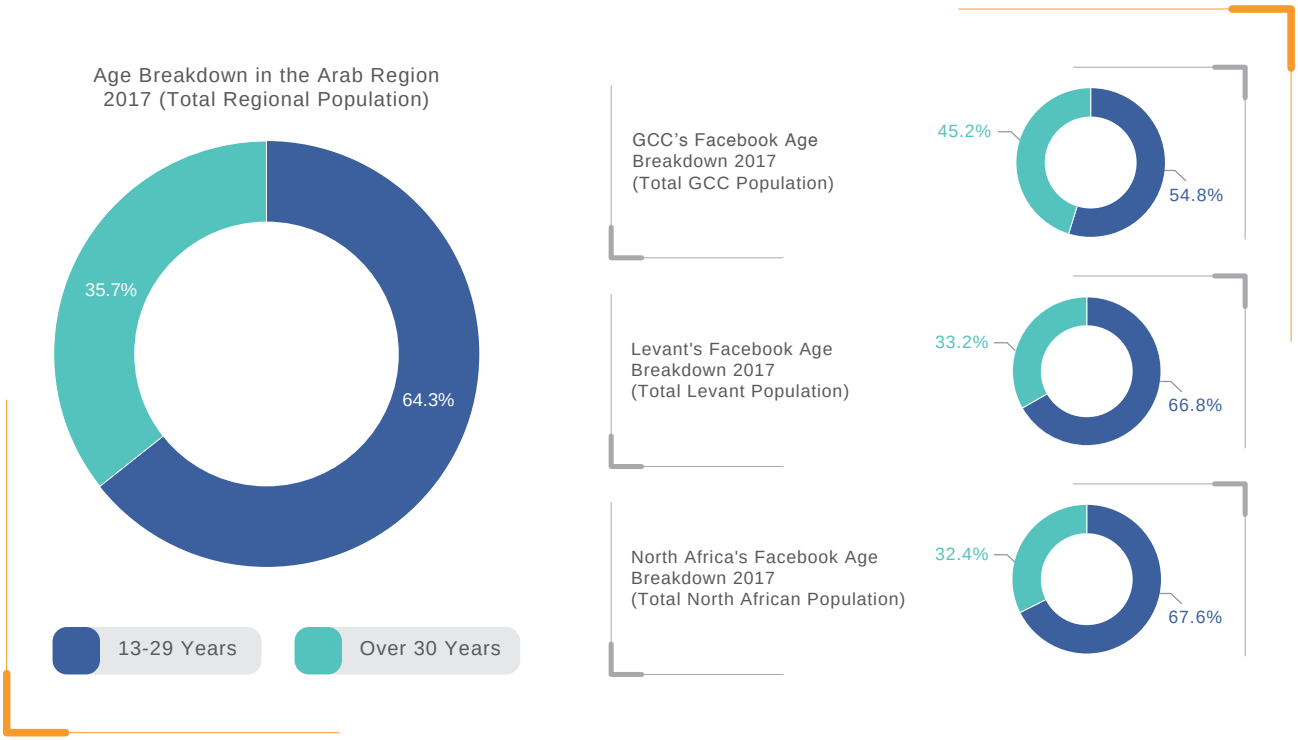
Kuwait remains the most 'mature' Facebook population in the region, where the percentage of those above 30 years old, reached up to more than 57% of all users, rising up from 54% two years ago. Somalia also remains the most youthful with 82% of the population under 30 years old.

Age Breakdown of Facebook Users in Arab Region (2017)



Users over the age of 30 now constitute more than half of Facebook users in the three countries of Kuwait, Bahrain and the UAE, and almost half of all users in Qatar. There seems to be continued maturity of social media users in these four Gulf countries. Overall, compared to the rest of the Arab region, the six GCC countries largely have more balanced breakdowns of young users who are under 30 and those who are over 30 years old, indicating maturity of usage across age groups in society. This also may be aligned with the actual age breakdown of the population in these countries, where a large percentage of the labor force are expatriates, in contrast with the large number of young people in other countries in the region, usually young students or unemployed youth.

Regional Age Breakdowns of Facebook Users in the Gulf, North Africa and the Levant (2017)

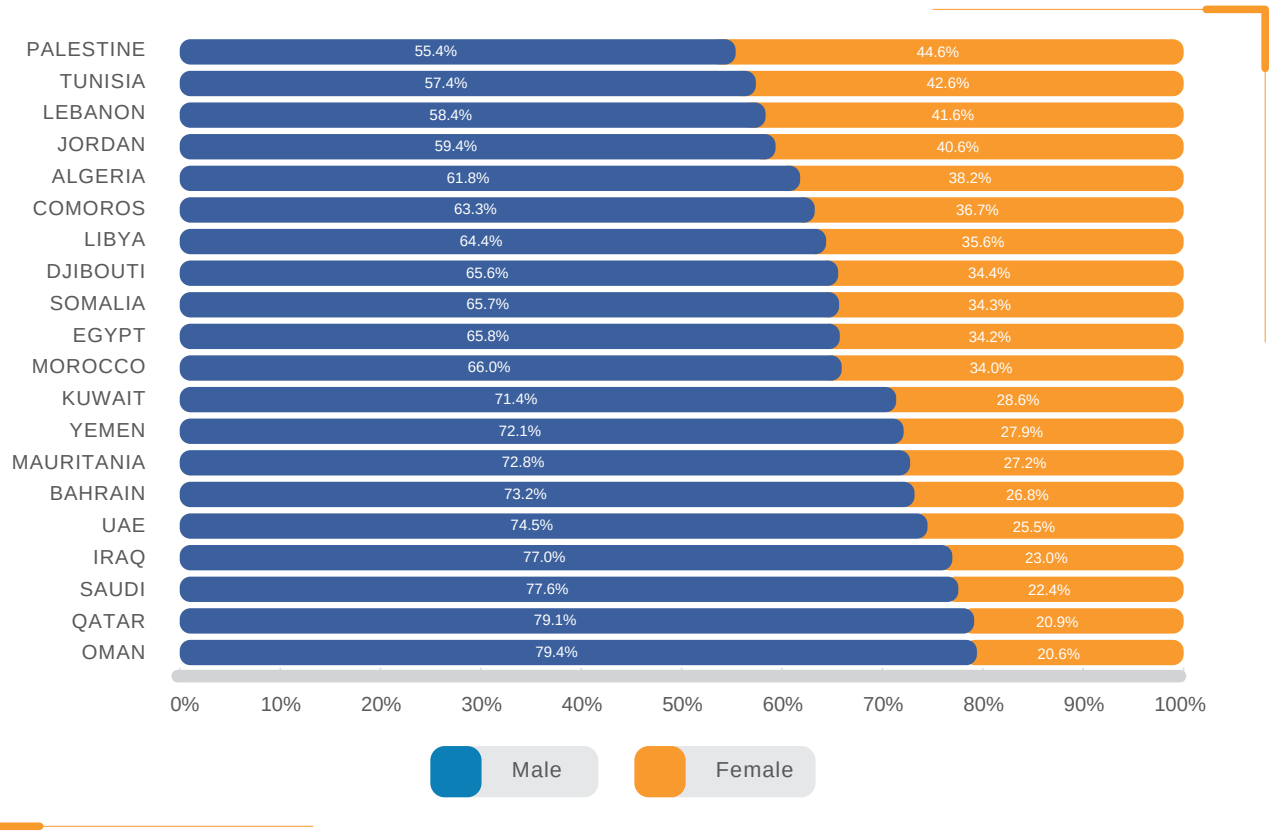


In terms of gender balance, the social media gender gap in the Arab region continues to be persistent over the past six years. By 2017, on average, females make up 32.3% of the total Facebook users in the region, almost unchanged from 31.8% in 2014, and 33.4% in 2013. This continues to be lower than the global average which is much more balanced in terms of gender. This finding highlights existing societal constraints that women face in general in the region, including the barriers female face in terms of access to education and technology. This is also consistent with the findings highlighted by our research in the 3rd edition of the Arab Social Media report[12].

However, there are noticeable changes in terms of gender breakdown in individual countries. Palestine has become the country with most gender-balanced Facebook users in the Arab region with almost 45% of the users being female. It is followed by Tunisia (43% females), Lebanon (42%) and Jordan (41%). Lebanon has dropped from the 1st to the 3rd rank over the past two years, while Yemen impressively jumped from the last spot in the region two years ago, to the 13th in 2017, surpassing all Gulf countries, but Kuwait.

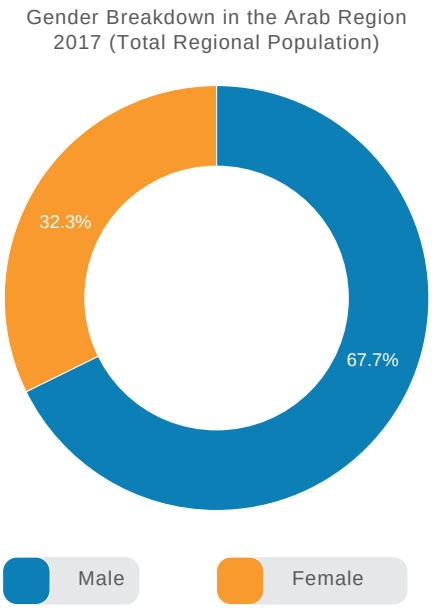
12. The Arab Social Media Report (Vol. 3), The Role of Social Media in Arab Women's Empowerment. Dubai School of Government. Dubai

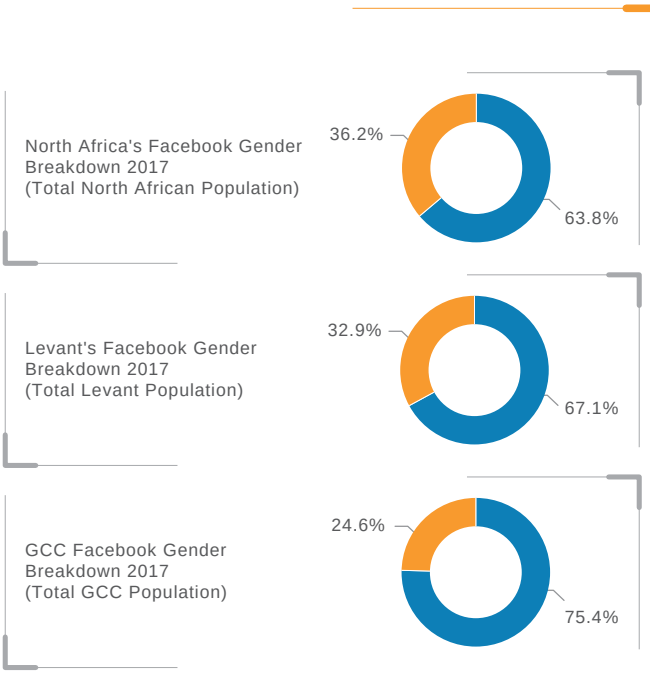
Gender Breakdown of Facebook Users in Arab States (2017)



On a regional level, the Gulf region has the worst gender balance on Facebook compared to the other regions in the Arab World. Only 1 out of 4 users in the Gulf region on average is a woman (24.6%), compared to 1 out of 3 in the rest of the region on average. Indeed, Oman has dropped to the last spot in terms of gender balance of Facebook users in the Arab region, while five out of the bottom six spots are occupied by GCC countries. North African countries have slightly better gender balance on Facebook compared to the regional average, with 36% of users being women. Meanwhile, the gender balance in the Levant region matches the regional average.

Regional Gender Breakdown of Facebook Users in the Gulf, North Africa and the Levant (2017)





2.1.3. Language Use: Arabic, English and French Language Use on Social Media in the Arab Region

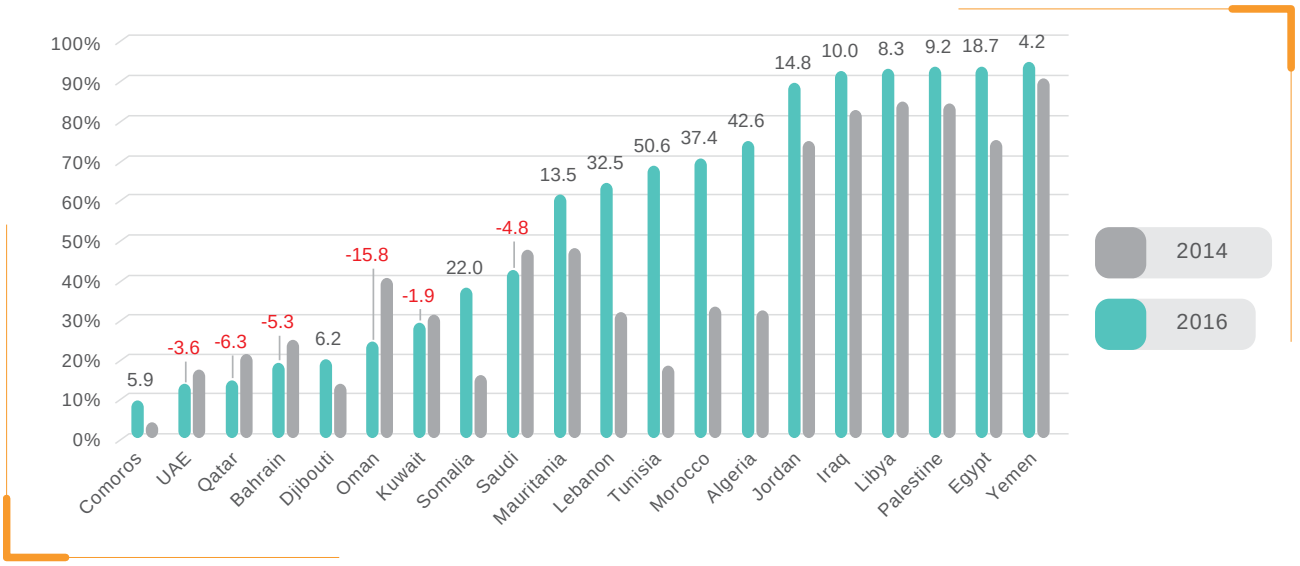
Arabic language use has grown across the region, excluding in the six Gulf countries, each of which has seen a drop in percentage of people using the platform in Arabic. In general, Arabic is becoming the dominant language on Facebook within the Arab region while many people continue to use multiple languages when posting or reading social media material[13].

The North African region saw the largest increase in levels of usage of Arabic language on Facebook, while the Gulf region saw a decrease in the use of Arabic language

Yemen continues to be the top country in terms of Arabic use on Facebook (with 95% of users using Arabic), followed by Egypt (94%), Palestine (93.8%), Libya (93.3), Iraq (92.9) and Jordan (90%). During the past two years, the largest increase of percentage of users interacting in Arabic on Facebook was in Tunisia (50%), followed by Algeria (43%), Morocco (37%), Lebanon (33%) and Somalia (22%). Meanwhile, Oman saw the largest decrease in Arabic language use (16%) followed by the rest of the Gulf countries, Qatar (6%), Bahrain (5.3%), Saudi (4.8%), UAE (3.6%) and Kuwait (2%).

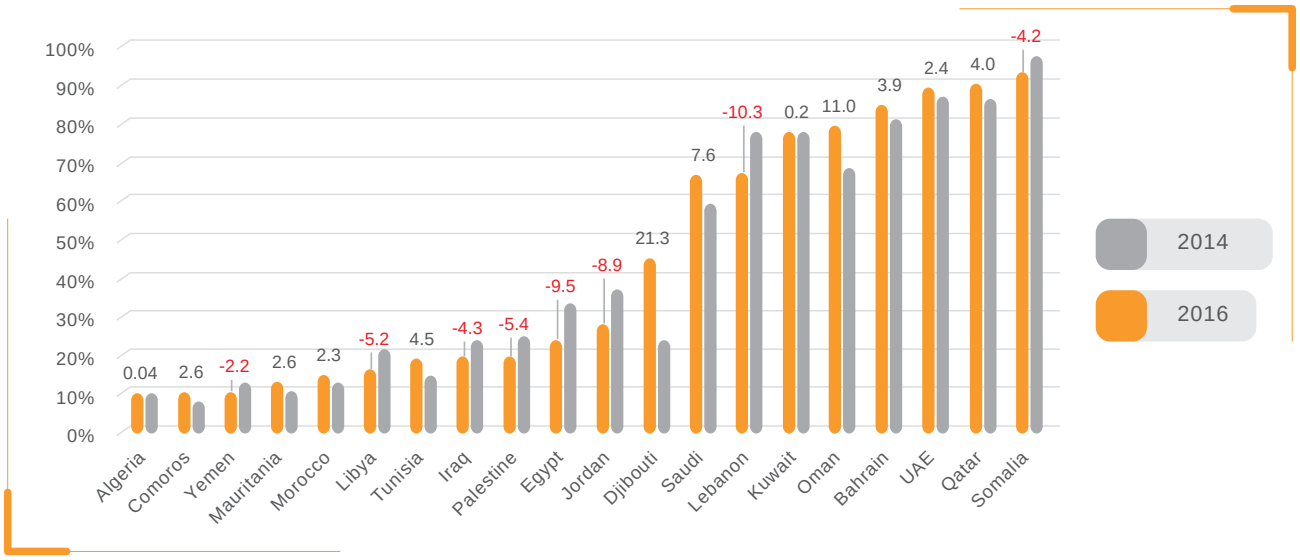
On a regional level, the North African region saw the largest increase in levels of usage of Arabic language on Facebook, while the Gulf region saw a decrease in the use of Arabic language. English remains the dominant language on Facebook for users in all Gulf countries, with an increasing numbers of people who use English on the site in these countries. North African countries; Tunisia, Algeria, Morocco, Mauritania as well as Djibouti and Comoros, continue to prefer the use of French over Arabic and English.

Arabic Language: Percentage of Facebook Users in the Arab States Who Use Arabic Out of Total Users

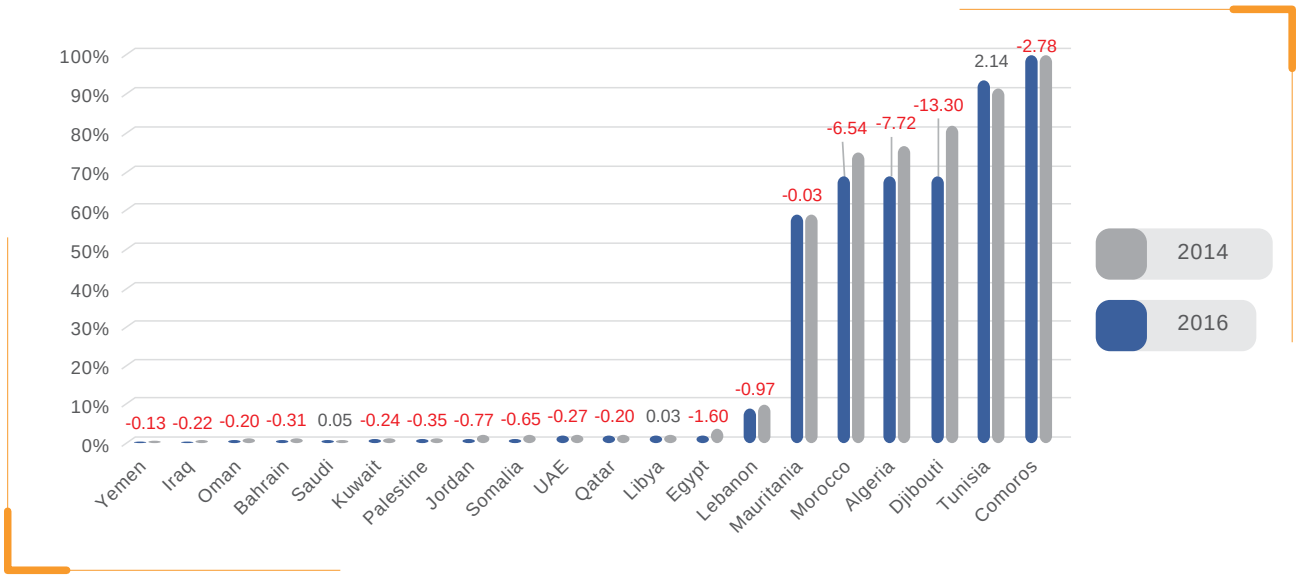


13. The same user may be accounted for more than once while calculating the breakdowns of Facebook users per language (once for each language they use).

English Language: Percentage of Facebook Users in the Arab States Who Use English Out of Total Users



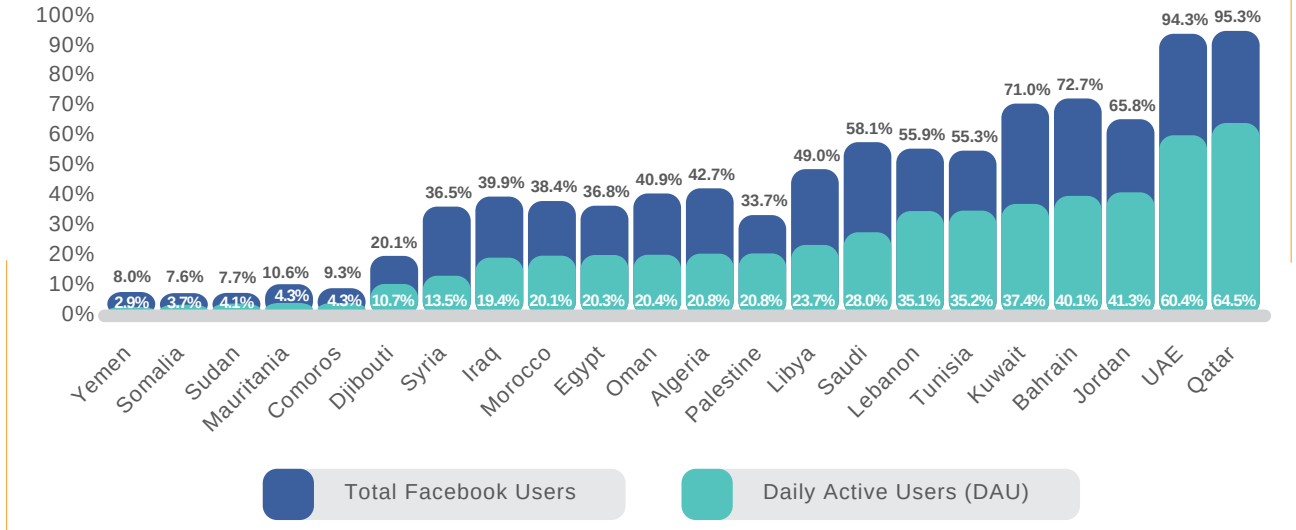
French Language: Percentage of Facebook Users in the Arab States Who Use French Out of Total Users



2.1.4. Active Facebook Users in the Arab Region

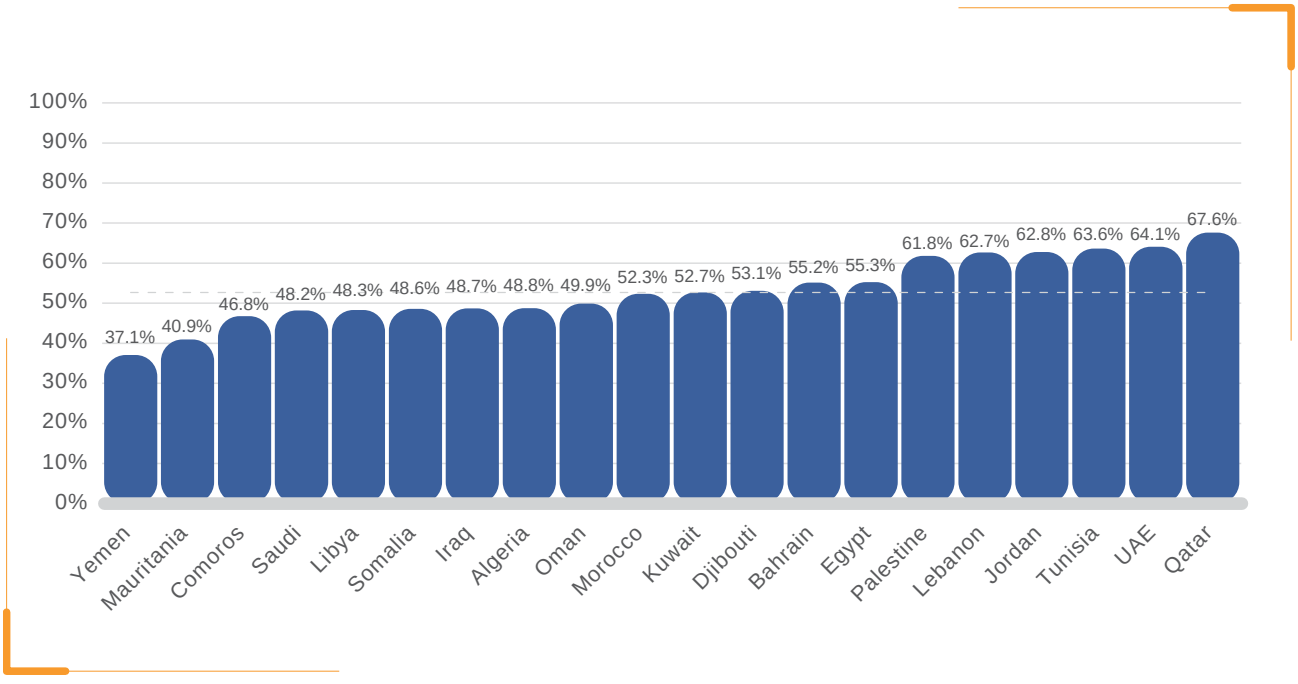
For the first time in this series, we compare the percentages of actual active users of Facebook versus the total number of accounts. Monthly active users (MAU) is a measure of accounts that are actually accessed or used at least once a month, meanwhile, a daily active user (DAU) is someone that uses the account at least once a day. This measure provides additional insight on the activity of social media which may be important in different developmental, engagement or policymaking decisions. Qatar, dominates in both overall penetration rates and percentage of daily active Facebook users in the country out of the total population, followed closely by the UAE. Meanwhile, Jordan has the 3rd most active population on Facebook in the region. On average, the percentage of daily active users on the regional level is 53% of total.

Penetration of Facebook's Total Users and Daily Active Users out of Total Population in the Arab States (Sorted by percentage of most active)



These measures and the contrasts they provide are useful when assessing feasibility of engagement mechanisms (by governments or businesses) across social media platforms. For example, while Saudi ranks 6th in the region in terms of penetration of total number of Facebook accounts, it ranks 17th in terms of the percentage of daily active users. In another example, while Tunisia ranks 8th in the region in terms of penetration rates of Facebook users in the country, it is almost tied as 2nd in the region alongside the UAE on the percentage of most active users out of total users. Take a third example, around 73% of the population of Bahrain has Facebook accounts, only 40% of the total population is active at least once a day, representing 55% of the total Facebook users in the country.

Percentage of Facebook Daily Active Users out of Total Facebook Users in the Arab States



2.2. Mapping Twitter in the Arab World

Highlights – Twitter in the Arab Region

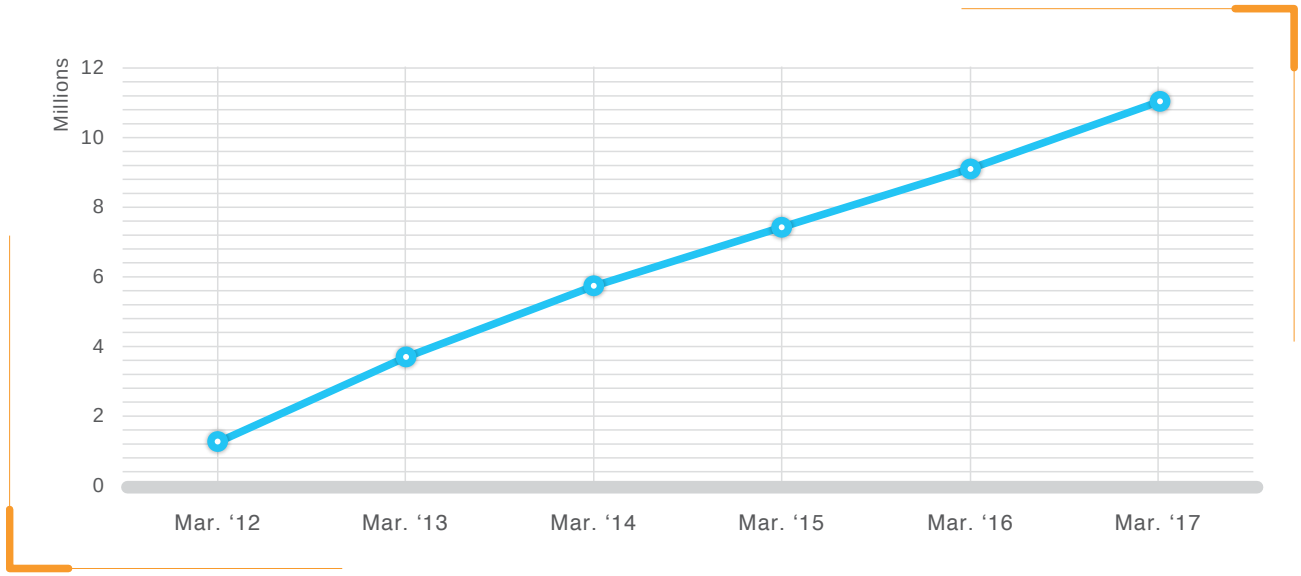
- **Total Users:** The total number of monthly active Twitter users in the Arab region is estimated to reach 11.1 million in March 2017, almost doubling up from 5.8 million three years ago.
- **Largest Share:** 29% of all active Twitter users in the Arab region are in Saudi Arabia, a share which has dropped from 40% in 2014. It is followed by Egypt with 18% share and Algeria and the UAE with 9% each.
- **Top Countries:** In terms of penetration rates, Bahrain and Kuwait have the highest penetration rates of active Twitter users in the Arab region.
- **New Users:** Over the past two years, Algeria witnessed the largest growth in terms of number of new active users on Twitter in the region, followed by Egypt and the UAE.
- **Monthly Tweets Volume:** The estimated number of tweets produced by active Twitter users in the Arab region in March 2016 was around 849.1 million tweets, an increase of more than 59% in volume over two years.
- **Tweets per day:** Collectively, the Arab world generates 27.4 million tweets per day up from 17.2 million tweets per day two years earlier.
- **Most Tweets:** More than half of all tweets generated in the Arab region are coming from two countries: Saudi Arabia generates 33% of all tweets in the Arab region and Egypt generates another 20% of all tweets in the region.
- **Most Active:** In terms of tweets per day, Kuwait has the most active Twitter users, producing an average of 4.2 tweets per day. It is followed by Saudi Arabia and Palestine.
- **Gender Breakdown:** The percentage of female Twitter users in the Arab region was 32.4% in 2016, dropping from 36.6% two years earlier.

2.2.1. Twitter Growth and Penetration Rates in the Arab Region

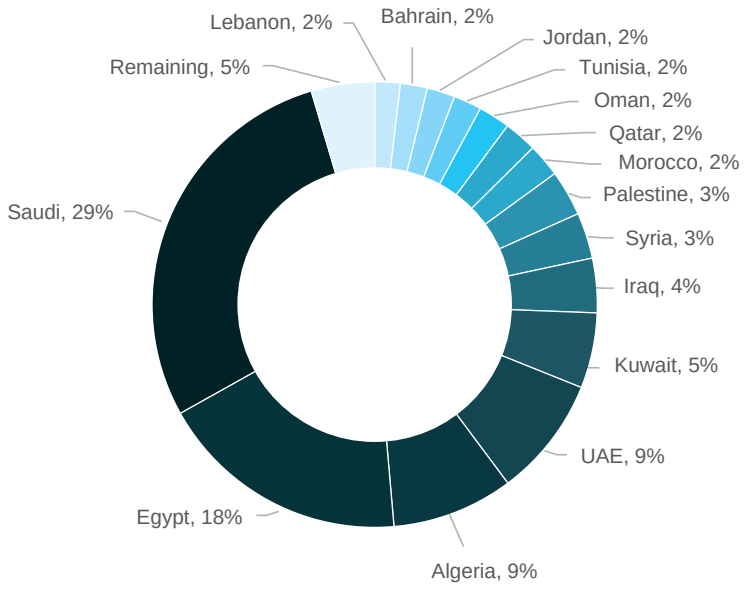
The number of monthly active Twitter users in the Arab region users according to our research is around 10.8 million in early 2017, a number we estimate to reach 11.1 million in March 2017, almost doubling up from 5.8 million three years earlier. As officially defined by Twitter, a monthly "active user" is someone who logs in (but does not necessarily tweet) once a month. These estimations are based on actual current and historical data collected by the Arab Social Media Report series between 2012 and 2016. The methodology used is detailed in Annex 1. Briefly, it consists of randomly sampling a very large number of Twitter data in each country captured across a certain period, and using this sample to extrapolate and estimate the active Twitter population. The volume of tweets, language, gender breakdown and top trends throughout March 2016 were also estimated using the same dataset.

The number of total Twitter accounts in the region is of course higher than the number presented above, which represents only the active users. Based on a regional survey of social media users, our estimation of accounts that are not classified as monthly active users is around 51% on Twitter. This suggests that the number of total Twitter accounts in the region could be as high 16.3 million by 2017. This includes accounts that are totally inactive or dormant, accounts active on less than monthly basis, accounts which are only used for reading tweets or communicating through direct messaging, as well as those accounts that tweet at least once a month which are analyzed here.

Twitter Growth Rates in the Arab Region between 2012 and 2017 (Monthly Active Users)

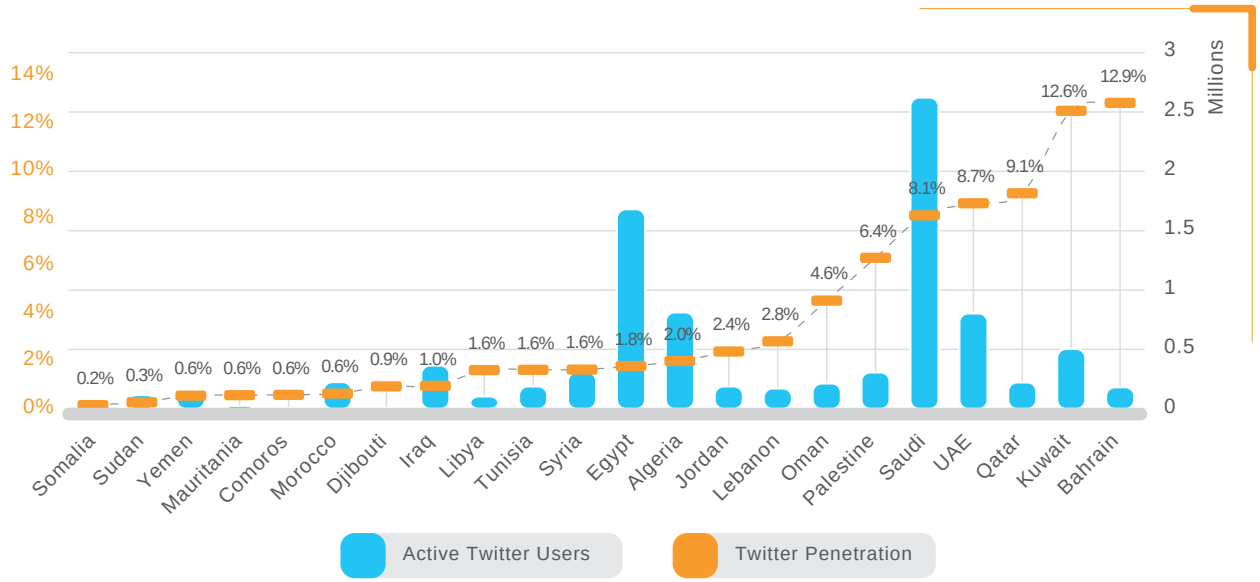


Distribution of Active Twitter Users in the Arab States



Saudi Arabia continues to lead with the highest number of active Twitter users in the region by a wide margin. With more than 2.6 million active users, Twitter users in Saudi Arabia account for 29% of all active users in the Arab region. Saudi Arabia is followed by Egypt; the country with the second highest number of active users with around 1.7 million. Algeria, however, has gained the largest number of new users since 2014, with around 774,000 new users, followed by Egypt (590,000) and the UAE (300,000). Overall, all countries, other than Lebanon, gained new active users on Twitter compared to two years earlier.

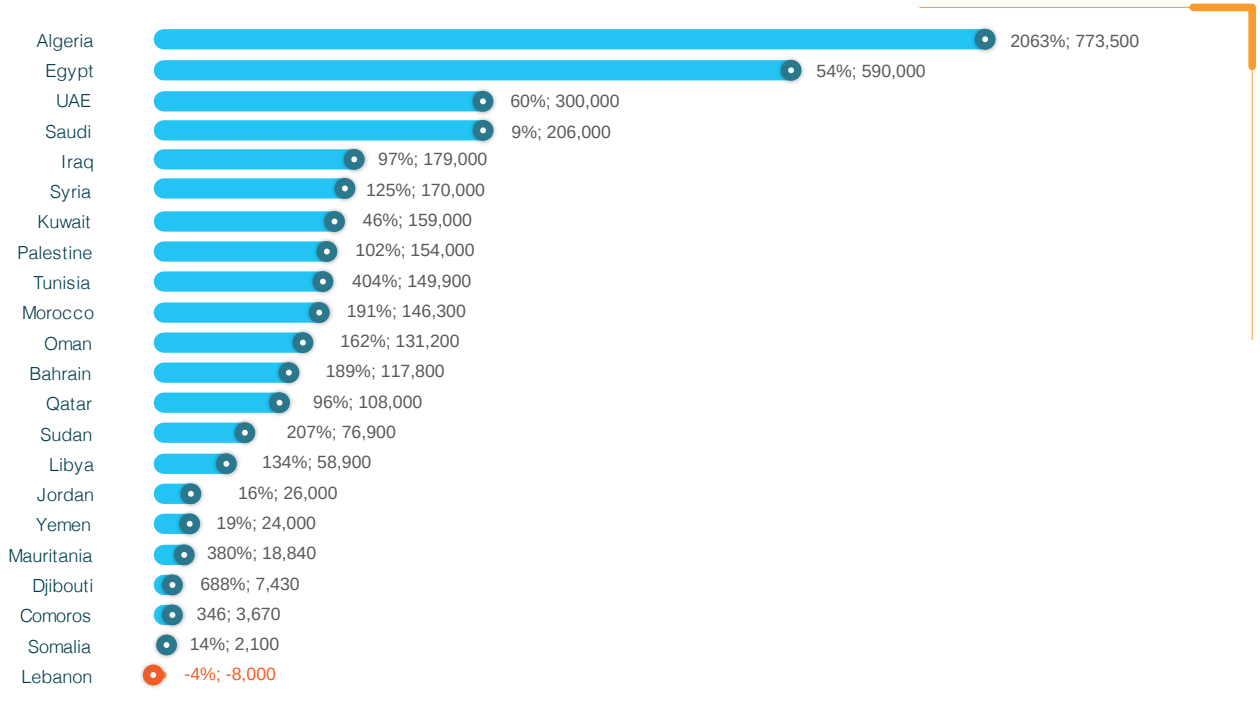
Penetration Rates of Active Twitter Users in the Arab States (March 2016)



In terms of penetration rates, Bahrain now leads the region, barely overtaking Kuwait, the country that had the highest penetration rates in the region between 2012 and 2014. The penetration rates of both countries of active Twitter users are around 13%. In general, the Gulf countries continue to have the highest penetration rates of active Twitter users in the Arab region, holding the top five ranks. Palestine is the only non-GCC country in the top 7 ranked countries in terms of penetration rates. Seven countries in the Arab region still have Twitter penetration rates below 1% of the population.

The Gulf countries continue to have the highest penetration rates of active Twitter users in the Arab region, holding the top five ranks

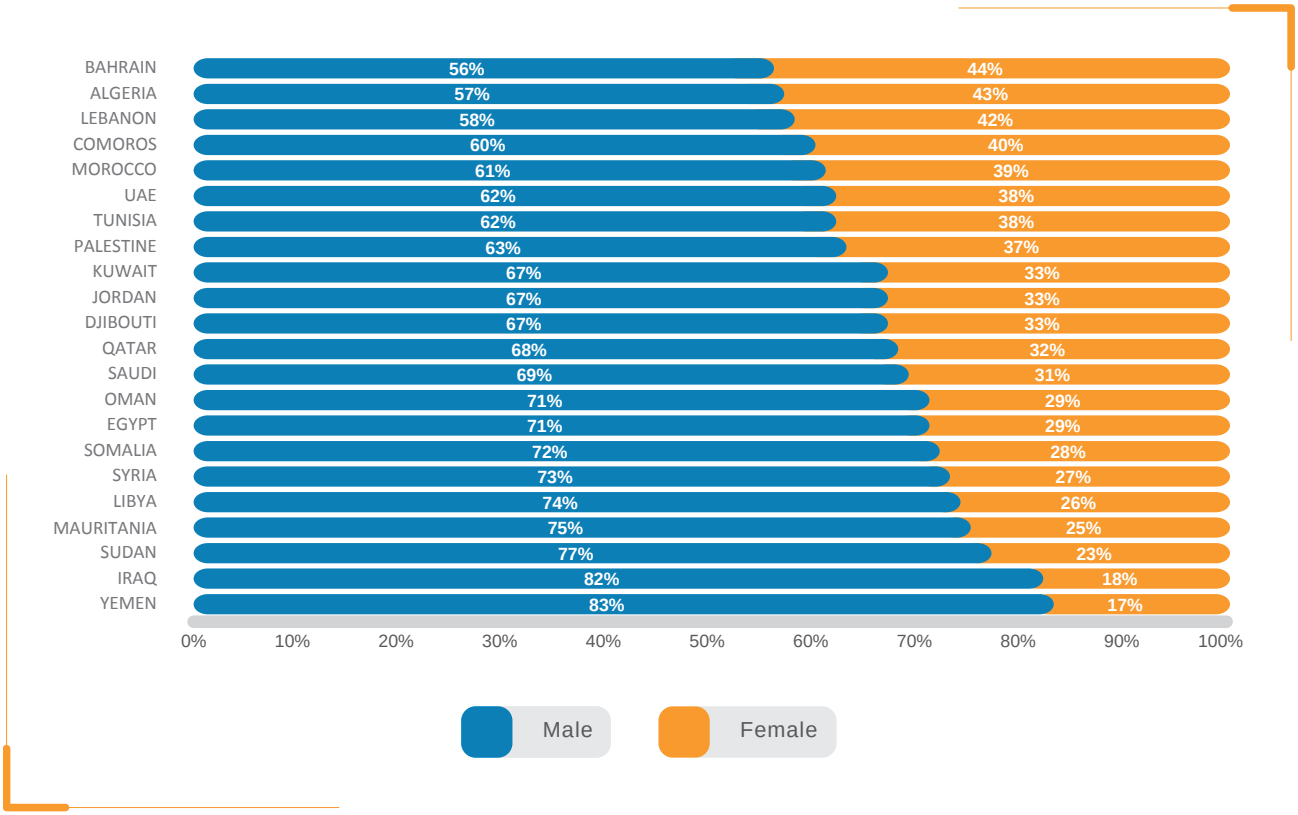
New Active Twitter Users in the Arab States (Mar 2014 and Mar 2016)



2.2.2. Demographic Breakdown of Twitter Users in the Arab Region

With regards to the gender breakdowns, our findings indicate that roughly a third (32.4%) of Arab Twitter users are females, which is lower than the global average, and in line with what we see regarding gender breakdown on other social media platforms. Bahrain now has the most gender balanced active Twitter users in the Arab region, followed by Algeria and Lebanon, which dropped from the top spot two years earlier. Yemen continues to have the smallest portion of female out of the total active Twitter users.

Gender Breakdown of Active Twitter Users in Arab Region

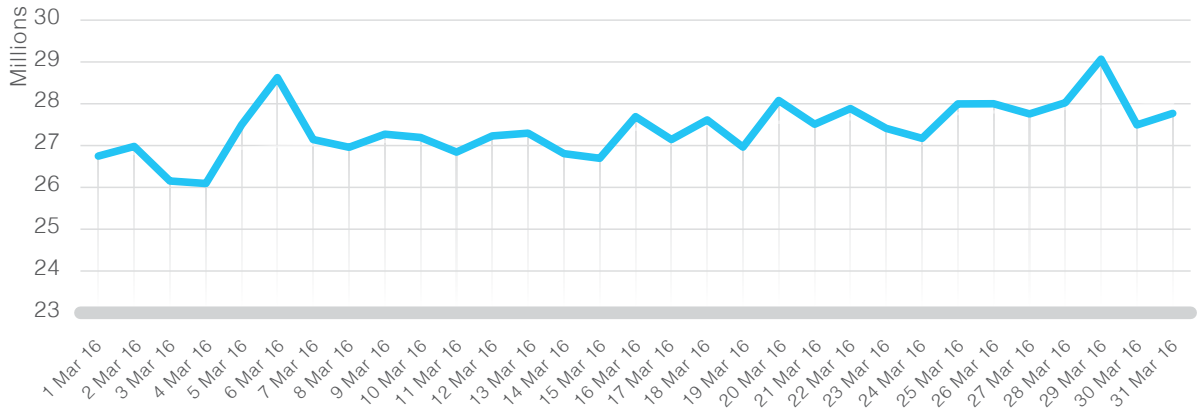


2.2.3. Tweets Volume across the Arab Region

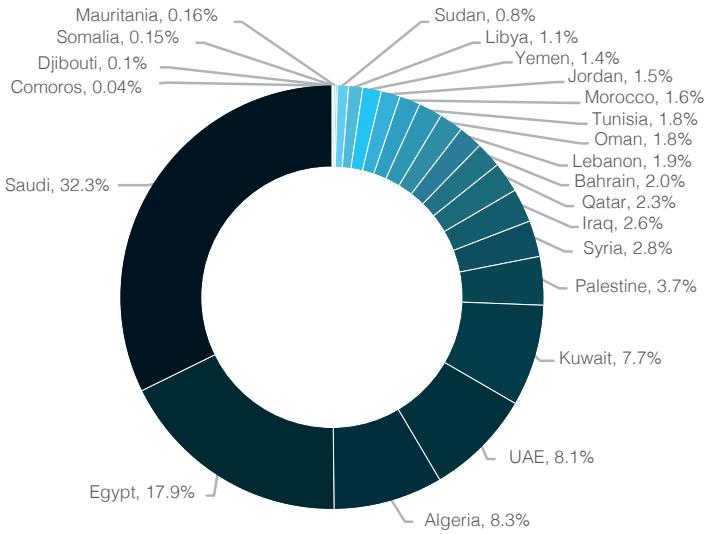
The estimated number of tweets produced monthly by active Twitter users in the Arab region was around 849.1 million tweets in March 2016, an increase of more than 59% in volume since two years earlier. Collectively, the Arab world generates an average of 27.4 million tweets a day, up from 17.2 million tweets per day two years earlier. More than half of all tweets generated in the Arab region are coming from two countries: Saudi and Egypt. Saudi generates more than 32% of all tweets in the Arab region while Egypt generates another 18%. Expectedly, countries with the highest numbers of active Twitter users account for the majority of tweets in the region. Saudi Arabia, alone, produced around 274 million tweets per month, while Egypt produced around 152 million, followed by Algeria (71 million) and the UAE (70 million).

More than half of all tweets generated in the Arab region are coming from two countries: Saudi and Egypt.

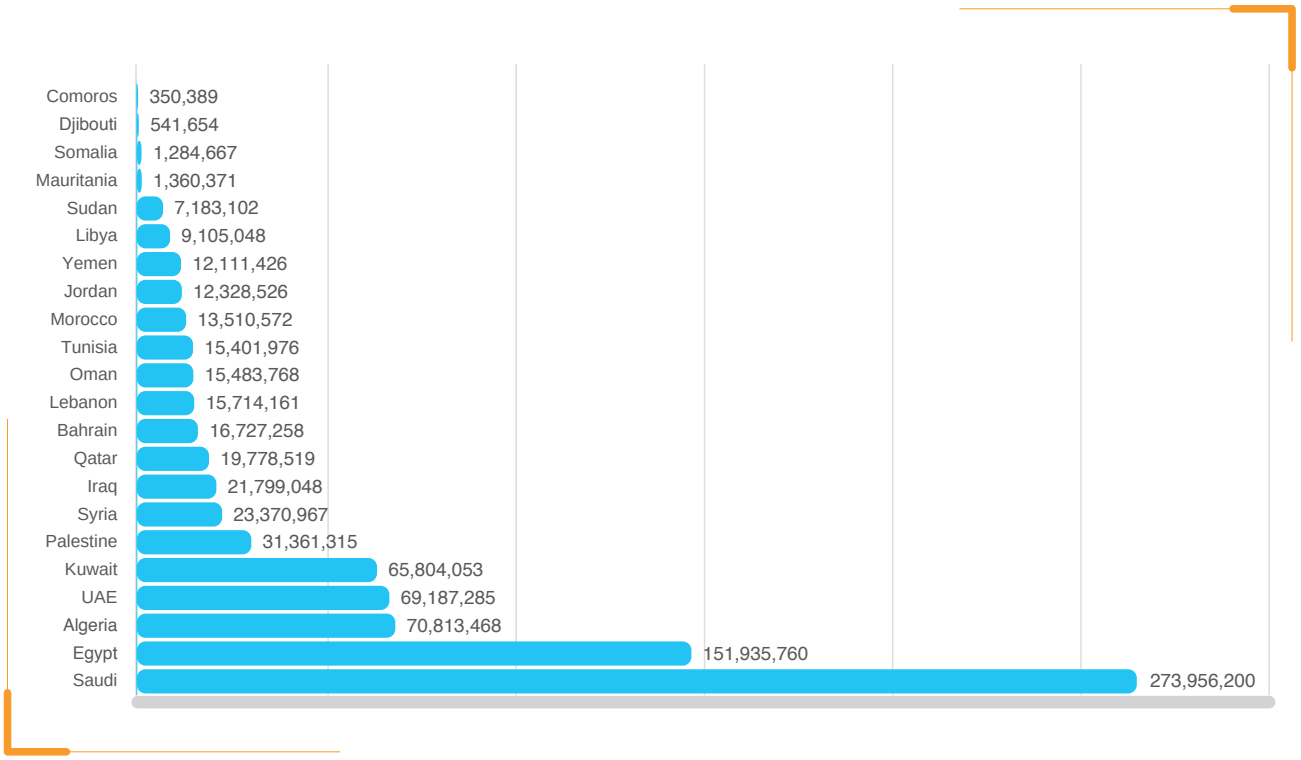
Tweets Volume Across the Arab Region (Mar 2016 as an example)



Distribution of Tweets Across the Arab States (Mar 2016)



Tweets Volume Generated in the Arab States per Month (Mar 2016)

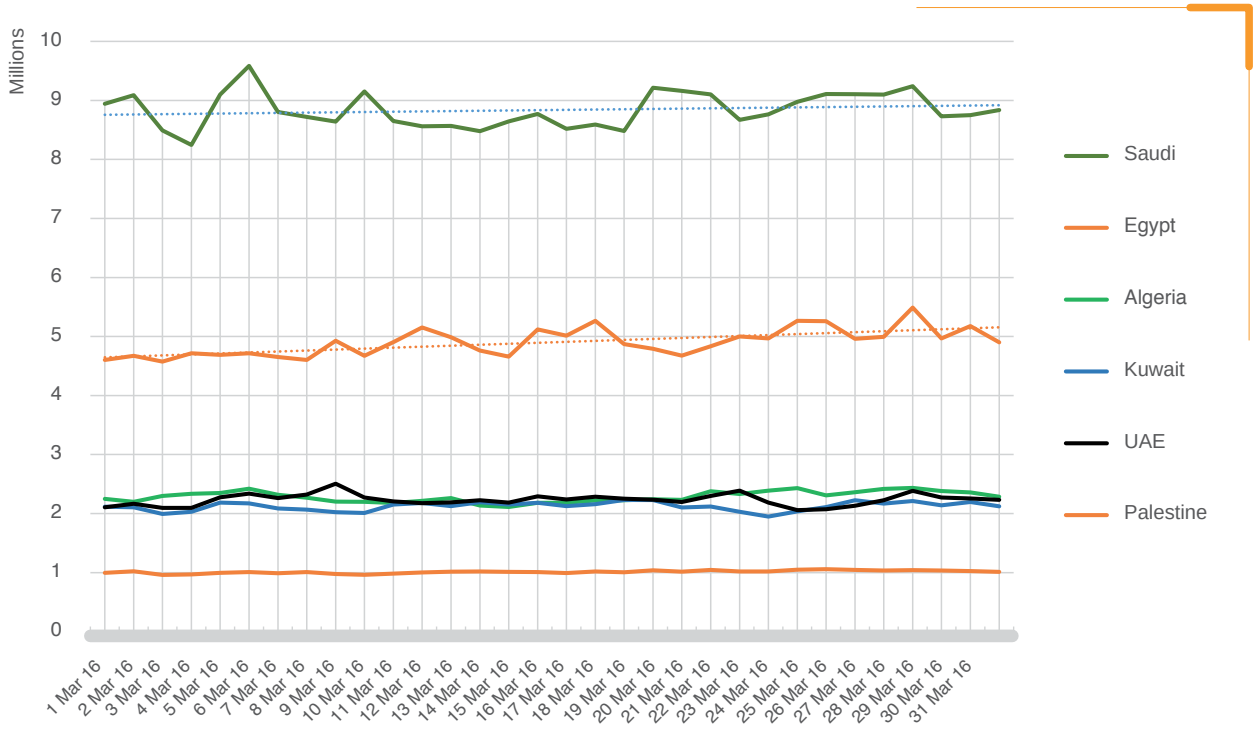


2.2.4. Twitter Activity across the Arab Region

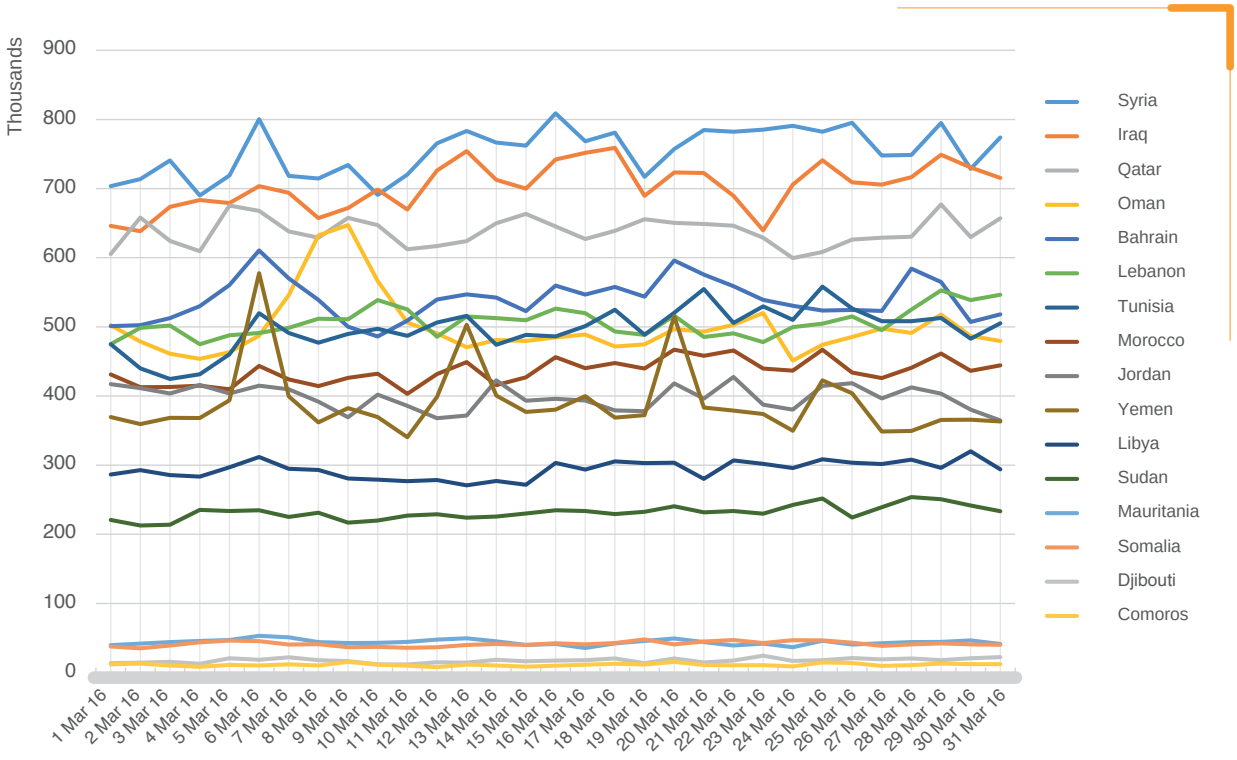
In terms of country-level activity on Twitter, the 22 Arab countries can be classified into three distinct groups: 1) Countries producing more than 1 million tweets a day, 2) countries producing between 100,000 and 1 million tweets, and 3) those producing less than 100,000 tweets a day. Only the following six Arab countries produce more than 1 million tweets a day: Saudi, Egypt, Algeria, Kuwait, UAE and Palestine. The majority of countries in the region produce between 200 and 800 thousand tweets a day. Mauritania, Somalia, Djibouti and Comoros each produce less than 100,000 tweets a day. On average, Saudi active Twitter users tweet around 8.8 million tweets a day, followed by Egypt with 4.9 million tweets a day and Algeria with around 2.3 million.

Only the following six Arab countries produce more than 1 million tweets a day: Saudi, Egypt, Algeria, Kuwait, UAE and Palestine.

Twitter Activity in Arab States Producing More than 1 Million Tweets Daily on Average (Mar 2016)



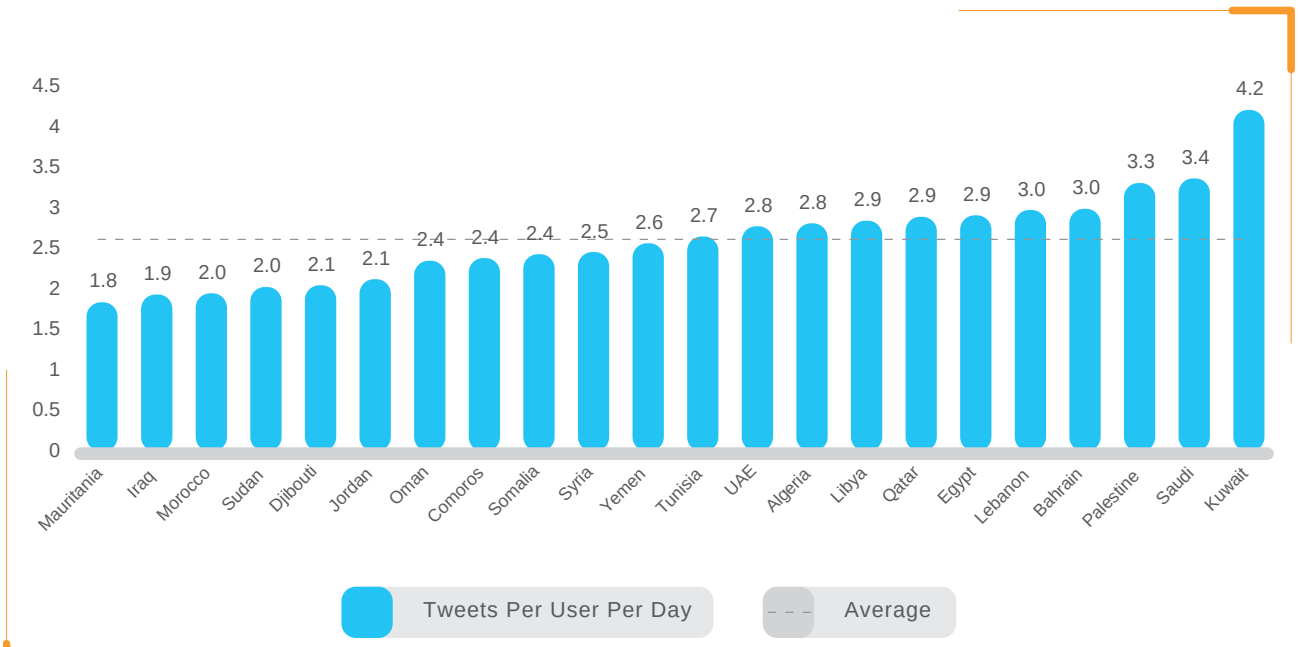
Twitter Activity in Arab States Producing Less than 1 Million Tweets Daily on Average (Mar 2016)



On average, active Twitter users in the Arab region tweet around 2.6 tweets a day. Kuwait has the most active Twitter users, in terms of tweets per day, producing an average of 4.2 tweets per day, constituting the largest average of Tweets per day in the region by a relatively wide margin. It is followed by Saudi (3.4 tweets per user per day) and Palestine (3.3 tweets per user per day). Mauritania has the least active twitter users with 1.8 tweets per day.

On average, active Twitter users in the Arab region tweet around 2.6 tweets a day

Tweets Per User Per Day in the Arab States (Mar 2016)



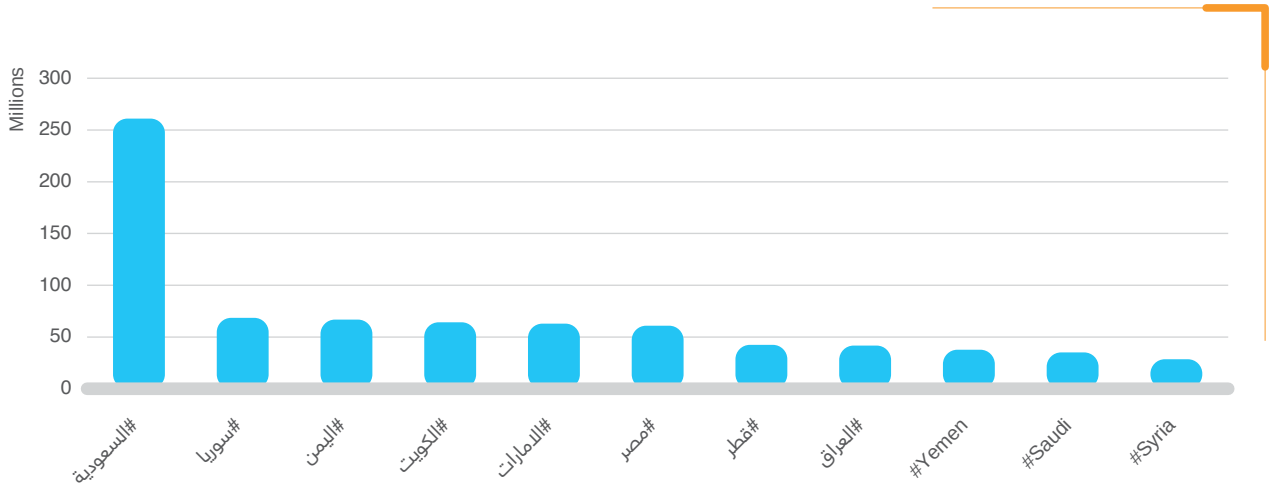
2.2.5. Twitter Usage Trends in the Arab Region

Across the region, the top country hashtags used in terms of how frequently they are mentioned in tweets, are illustrated in figure below. The top trending country hashtags, were estimated during the month of March 2016 taking into account all mentions of the country names in hashtags in both Arabic and English. During this period, hashtags using the different forms of writing Saudi's name in Arabic (السعودية) were by far the most frequent, with an estimated 261 million tweets from around the region. This is followed with hashtags of Syria in Arabic (سوريا), then Yemen (اليمن), Kuwait (الكويت) and the UAE (الإمارات). This indicates that most discussions on twitter generated in the region were taking place in Arabic; a growing trend in terms of language use in the region. Across the top ten most frequent hashtags of country names in the region, only two were in English: Yemen and Saudi. This was followed by Syria in English.

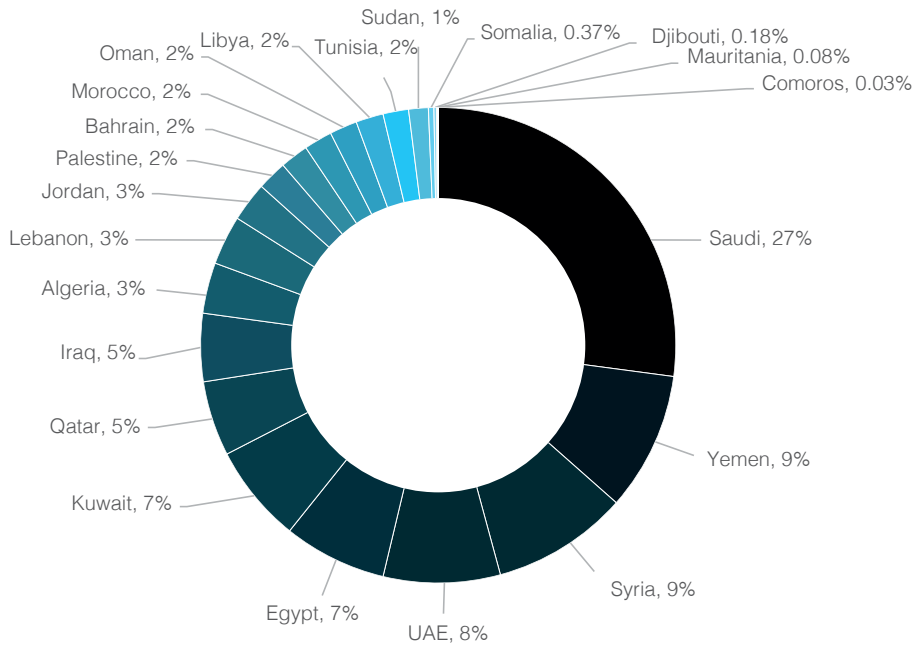
Most discussions on twitter generated in the region were taking place in Arabic

Of a list of all country hashtags included in tweets in Arabic and English combined[14], those mentioning Saudi (in either language) constitute 27% of all tweets. This is three times the number of those mentioning Yemen or Syria (9% each), which come second and third. The UAE and Egypt follow next. These findings suggest that discussions on Twitter in the region (indicated by using country hashtags) is partly related to ongoing military or political conflicts in the region.

Top Country Hashtags Used Across the Arab Region (Mar 2016)



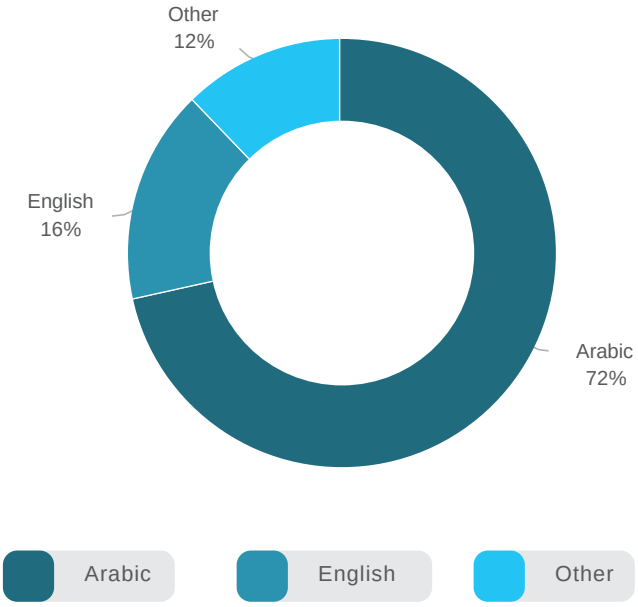
Top Country Hashtags Used in Each of the Arab States (Mar 2016)



14. All possible spellings and writing styles of country names in both English and Arabic were analyzed.

In terms of language use on Twitter, tweets in Arabic account for over 72% of all tweets generated in the Arab world. This percentage has been almost stable (around 2% lower) since March 2013. English comes next with only 16% of tweets, while around 12% used other languages while tweeting. Arabic dominates the tweets produced in Saudi Arabia, Kuwait and Egypt, three of the countries that generate the largest number of tweets in the region. Meanwhile, Saudi has maintained its position as the generator of the highest percentage of tweets in Arabic in the region (92%), followed by Kuwait (85%) and Oman (81%).

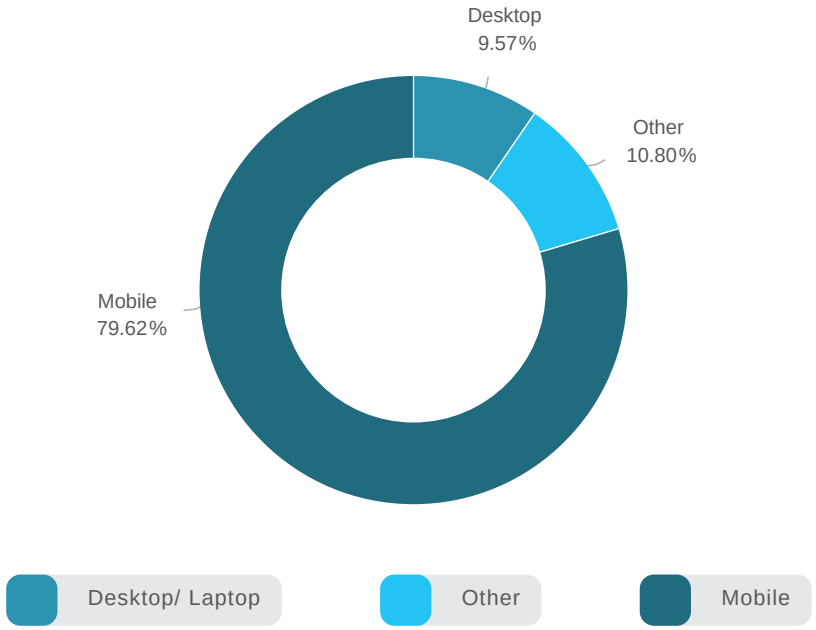
Language Use on Twitter across the Arab Region (Mar 2016)



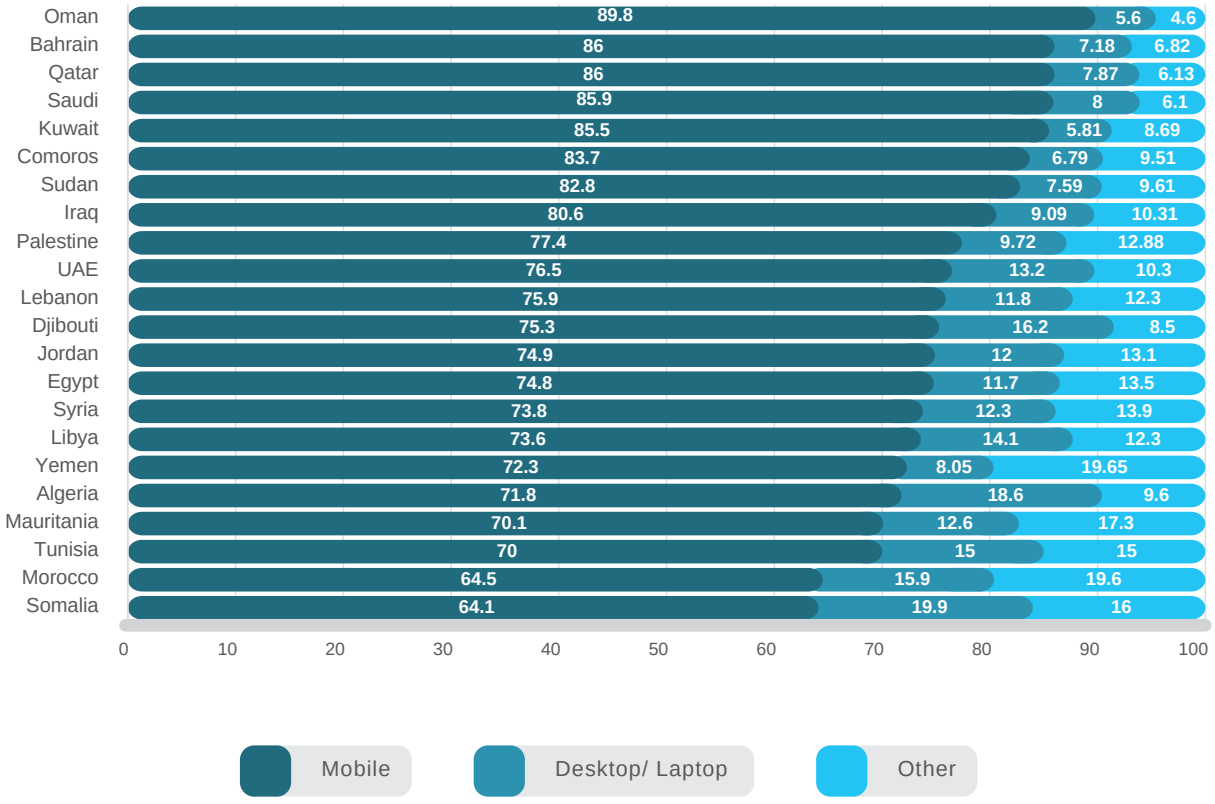
Using mobile devices to tweet is the dominant method in every single Arab country

At least four out of five active Twitter users in the Arab region tweet using a mobile device according to data collected for this report. This reflects the growth of mobile connectivity around the region in general as well as the nature of the platform. Only 10% of tweets are generated through desktop or laptop computers in the region. On a country level, users in the Gulf region are using Twitter mostly through mobile, with the top five countries in terms of tweeting using mobile being Gulf countries. Oman leads in terms of percentage of mobile users of the platform with around 90% of total users. Meanwhile, the countries ranked lowest in terms of using mobile devices to tweet are dominated by North African countries. This being said, using mobile devices to tweet is the dominant method in every single Arab country. The country that uses mobile devices the least to tweet (Somalia), at least 64% of tweets are actually generated through mobile devices.

Use of Twitter by Device Across the Arab Region (Mar 2016)



Breakdown of Uses of Twitter by Device Across the Arab States (Mar 2016)



2.3. Mapping LinkedIn in the Arab World

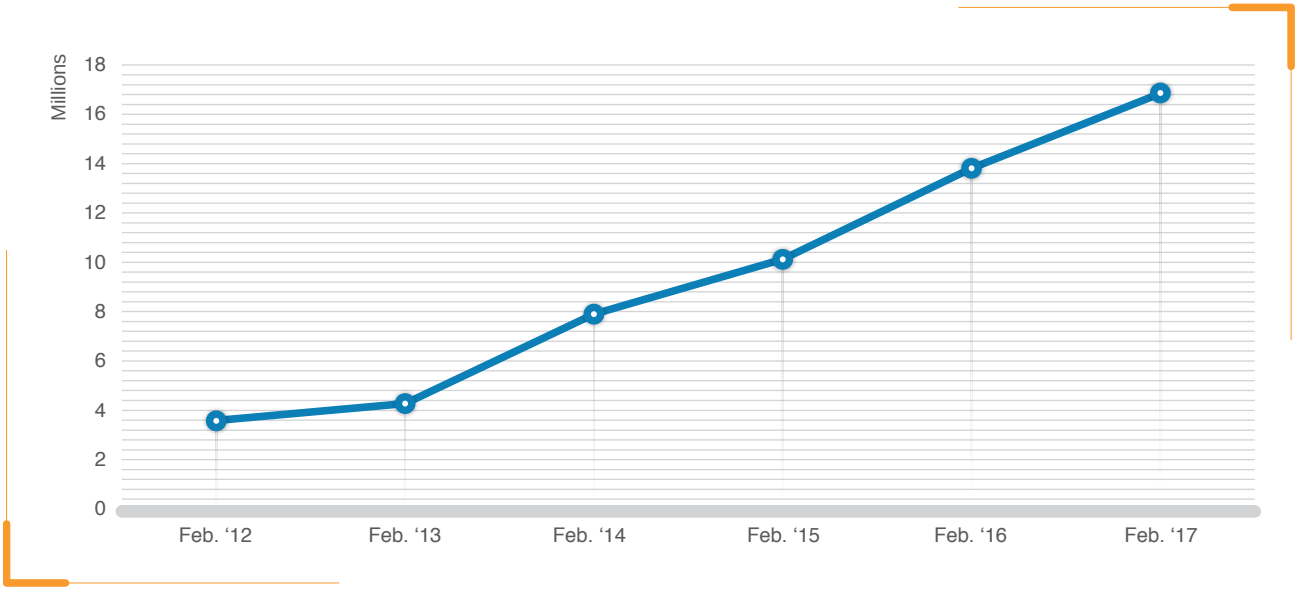
Highlights - LinkedIn in the Arab Region

- **Arab Users:** The total number of LinkedIn users in the Arab world reached 16.6 million as of January 2017, a growth of around 22% over a year earlier.
- **Regional Penetration:** By 2017, the actual penetration rate of all LinkedIn accounts in the Arab region reached 4.1%. However, the average LinkedIn country-penetration rate across Arab countries was 6.75% in October 2016, up from 3.8% two years earlier.
- **Top Countries:** The UAE has the highest penetration rates of LinkedIn in the region by a wide margin (32.5%), with one in every three people in the country owning a LinkedIn account. It is followed by Qatar (22%) and Bahrain (17%).
- **Largest Share:** 20% of all LinkedIn users in the Arab region are based in the UAE, followed by Saudi (16.2%), Egypt (15.6%), Morocco (9.5%) and Algeria (8.4%).
- **Youth:** Youth below the age of 35 still constitute the majority of LinkedIn users in the region. Two thirds of LinkedIn users in the region (68%) are between the ages of 18-35, a ratio that has been stable over the past three years.
- **Gender Breakdown:** Female users in the Arab region constitute about 28% of all LinkedIn users, a percentage that has also been largely static over the past two years

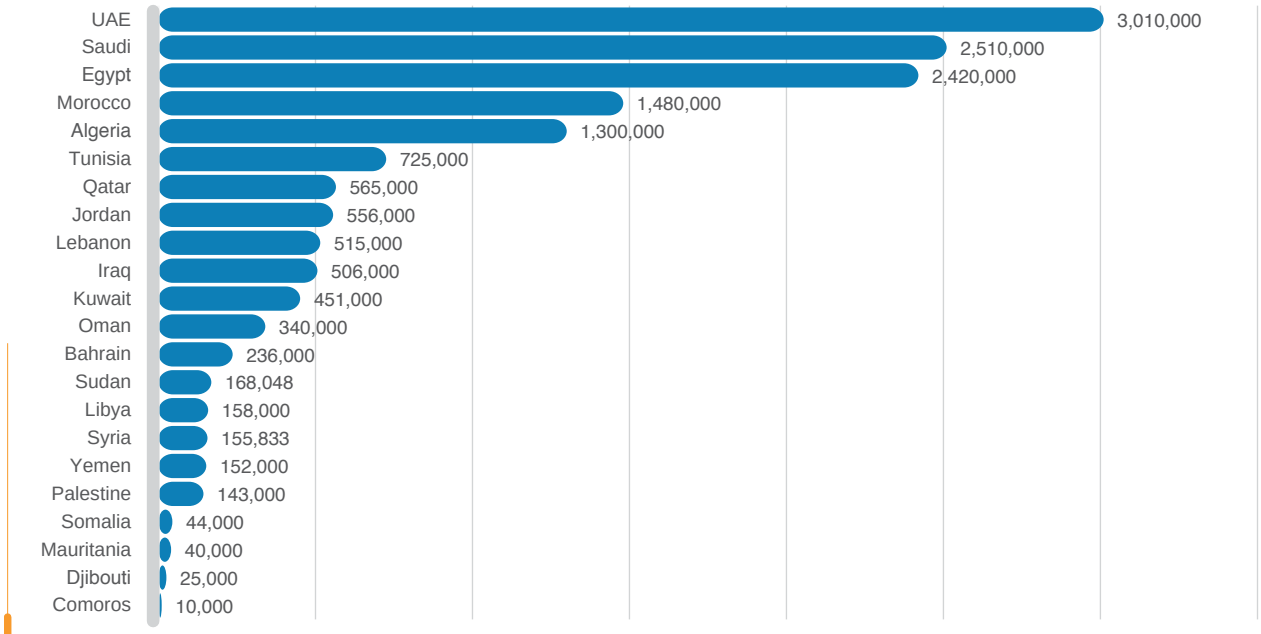
2.3.1. LinkedIn Growth in the Arab Region.

There were more than 16.6 million LinkedIn users in the Arab region by January 2017, growing by a rate of 22% since a year earlier. LinkedIn penetration has increased across all countries in the region. The average penetration rate among Arab countries is 6.8%. In total, 4.1% of all inhabitants of the Arab region own a LinkedIn account.

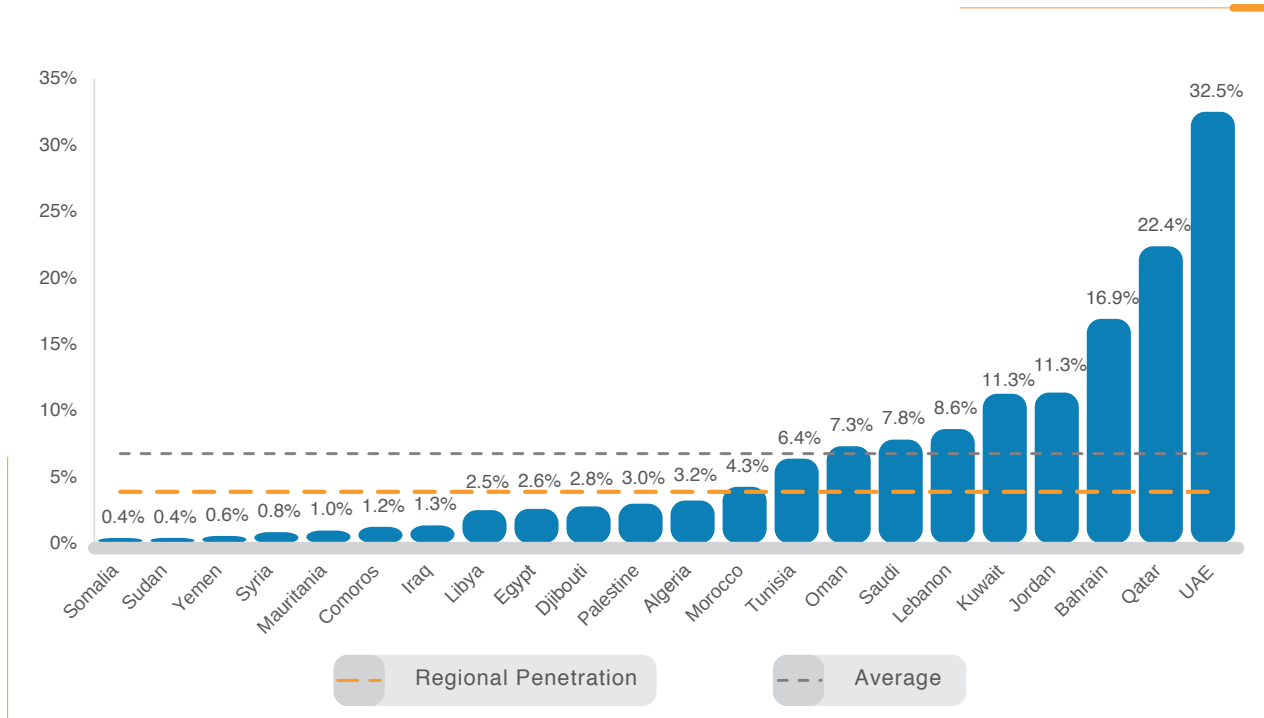
LinkedIn Growth in the Arab Region (2012 - 2017)



Number of LinkedIn Users in the Arab States



LinkedIn Penetration Rates across the Arab States

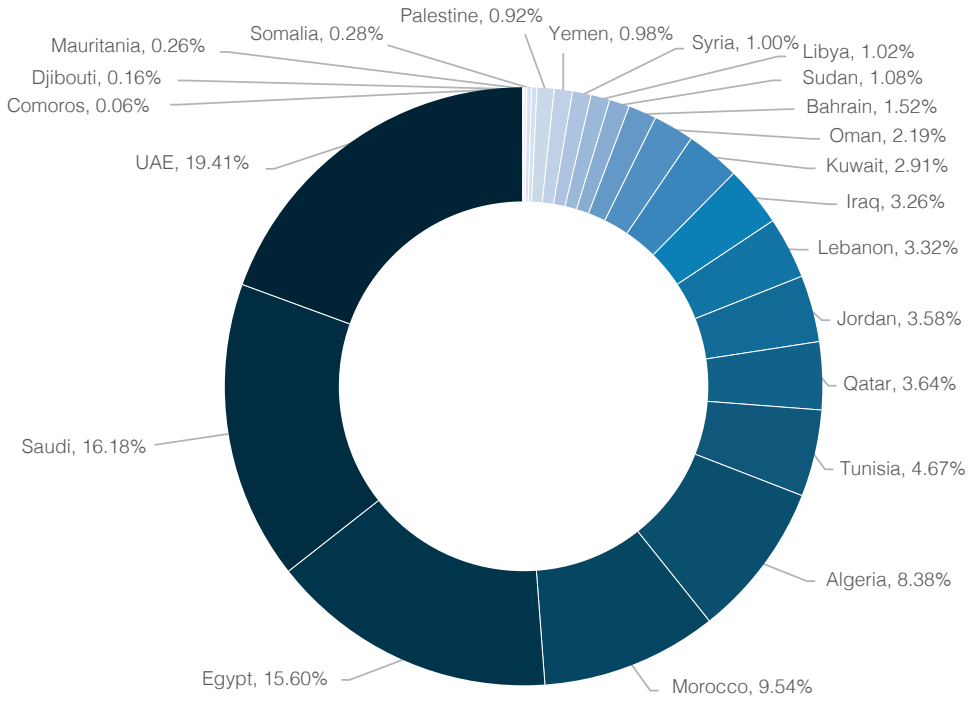


On a regional level, penetration remains highest in the UAE, highlighting the regional status of the country as a primary job market and economic center. Almost 1 out of 3 people in the UAE owns a LinkedIn account. Penetration rate in the country grew by 10 percentage points from 22.7% to 32.5% in less than three years, which was the fastest growth in the region. This is followed by Jordan, which grew by 5 percentage points, almost doubling the penetration rates in the country during the same

period. The Gulf countries still dominate the top three spots in terms of penetration in the region, a trend that continues since 3 years.

In terms of regional shares, the UAE also has the largest share of users in the region. Every 1 in 5 LinkedIn users in all the Arab region is based in the UAE. Saudi and Egypt followed in terms of shares of users in the region. Overall, more than half the users in the Arab region are located in the three countries of the UAE, Saudi and Egypt.

Distribution of LinkedIn Users Across the Arab States



2.3.2. LinkedIn Gender and Age Breakdowns

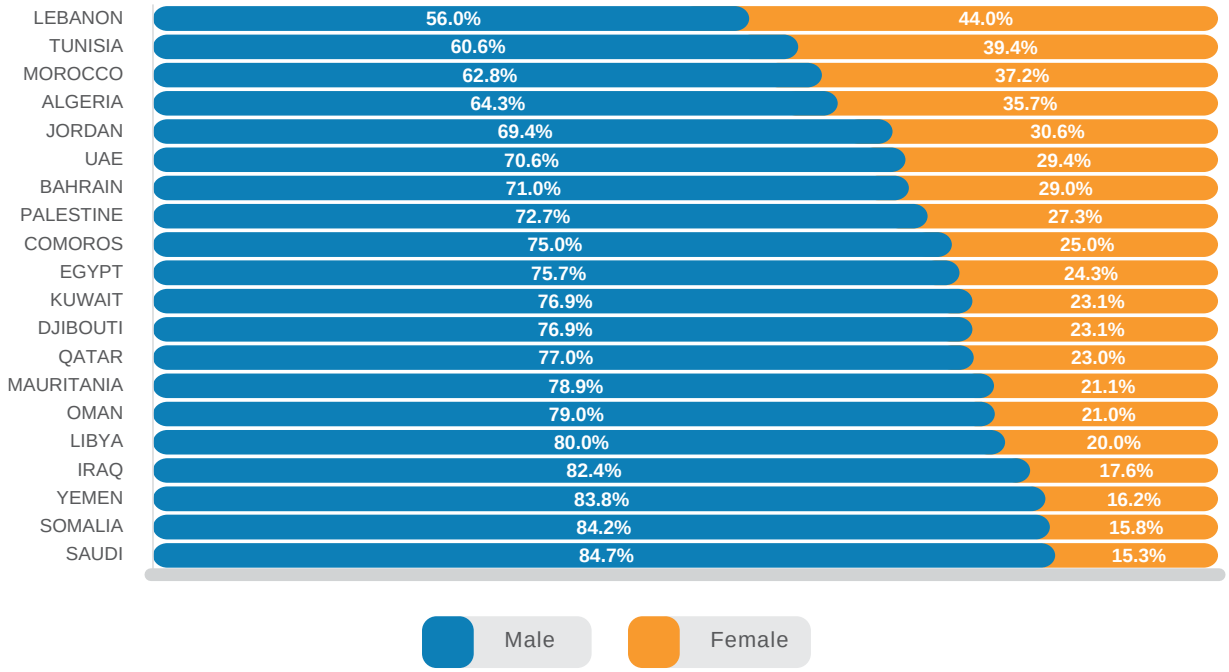
Adoption of LinkedIn, a career-oriented social media platform, by women in the region remains low, with only 28% of all LinkedIn users being women. This gender imbalance has been largely static over the past two years.

On the country level, the 7 top countries in terms of gender balance in the region have remained the same over the past three years. Lebanon continues to lead as the most gender balanced country in the region, followed by the three North African countries, Tunisia, Morocco and Algeria. Saudi continues to be the least gender balanced in terms of LinkedIn users, with only 15% of all users in the country being women. As the platform is job and career oriented with professional objectives, this low usage by women in Saudi may be related to the nature of the job market in the country and the employment opportunities available to women.

Adoption of LinkedIn, a career-oriented social media platform, by women in the region remains low, with only 28% of all LinkedIn users being women.

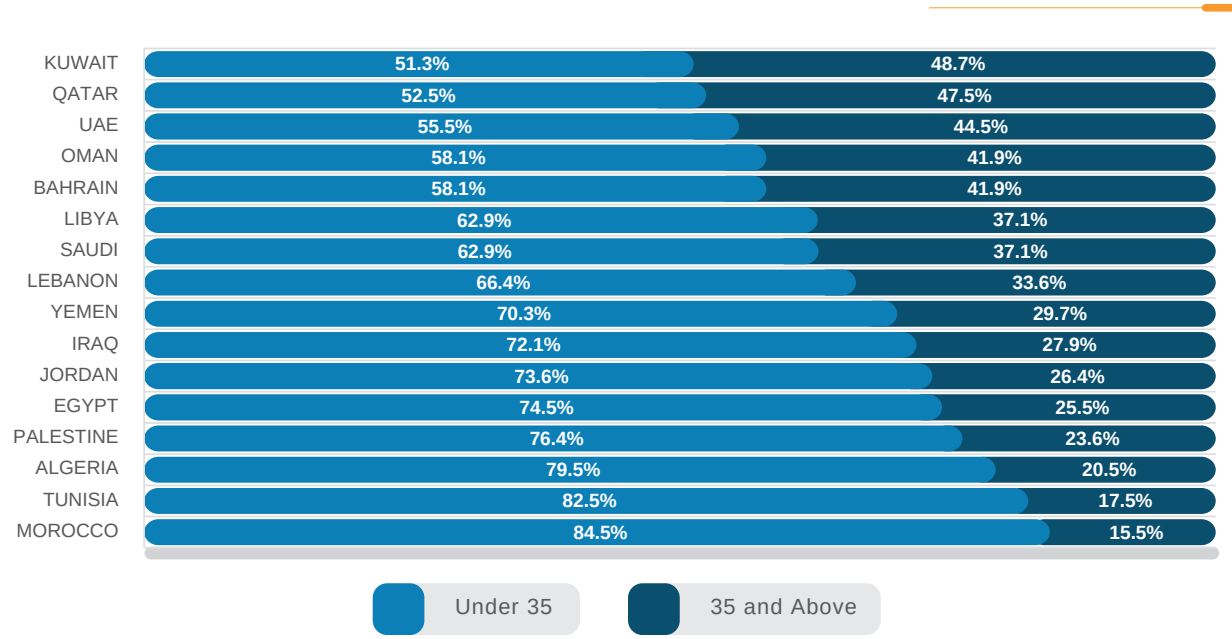
Overall, there were limited changes in the ratios of gender breakdowns in most Arab countries. However, slight increases (less than 2%) in terms of women using LinkedIn were observed in Bahrain, UAE, Oman and Saudi.

LinkedIn Gender Breakdown across the Arab States



In terms of age breakdown, youth below the age of 35 still constitute the majority of LinkedIn users in the region. Two thirds of LinkedIn users in the region (68%) are between the 18-35 years old. Kuwait has the most 'mature' (and balanced) breakdown, with almost 51% under 35 years old. Morocco has the most youthful LinkedIn users, with almost 85% of users being under 35 years old. Overall, the Gulf region has the most balanced breakdowns of LinkedIn users in terms of age, with the 5 countries of Kuwait, Qatar, UAE, Oman and Bahrain having the most balanced age breakdowns. On the other hand, users in the North African countries of Morocco, Algeria and Tunisia are mostly dominated by youth under 35 years old.

Age breakdown of LinkedIn Users in Select Arab States



2.4. Mapping Instagram in the Arab region

Highlights – Instagram in the Arab Region

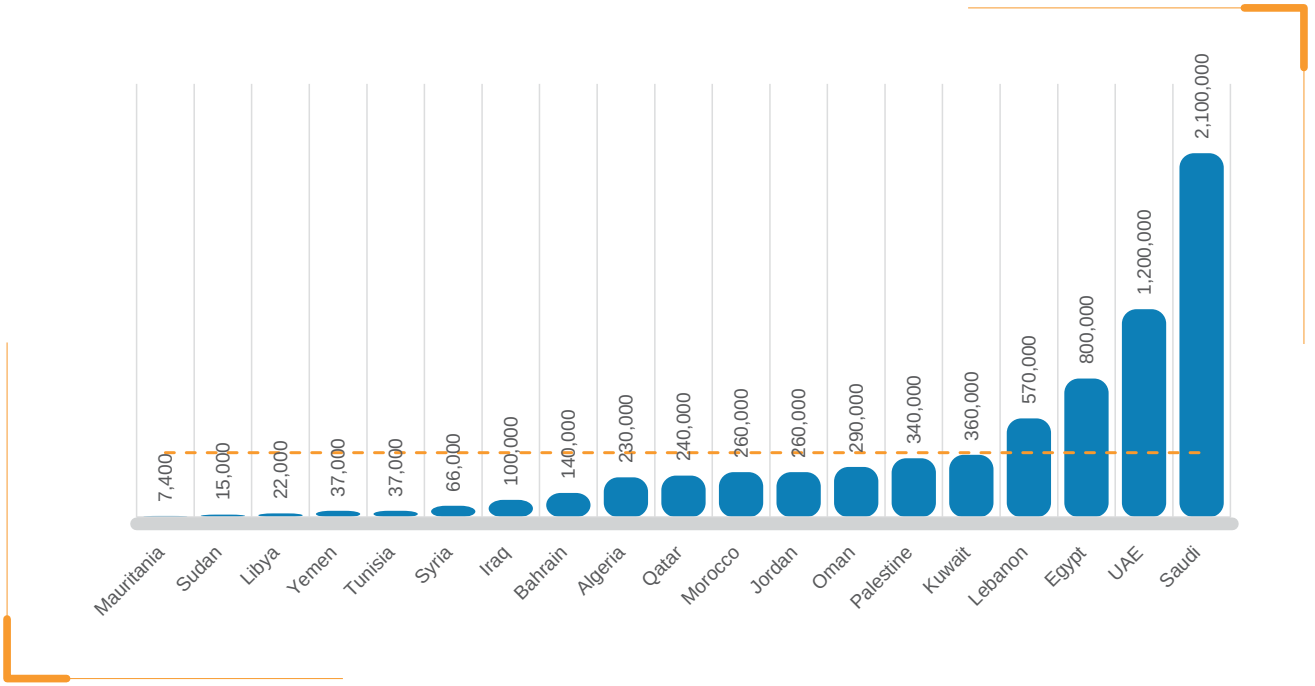
- **Arab users:** The total number of active Instagram users in the Arab world is around 7.1 million in early 2017.
- **Regional Penetration:** By 2017, the penetration rate of active Instagram accounts in the Arab region reached 1.8% overall.
- **Top Countries:** The UAE has the highest penetration rates of Instagram in the region with 13% of the population active on Instagram. It is followed by Bahrain (10%), Lebanon (9.5%), Qatar (9.1%) and Kuwait (9%).
- **Largest Share:** Saudi has the highest share of Instagram users in the region, with 30% of all active Instagram accounts being in Saudi. It is followed by the UAE (17%), Egypt (11.3%), Lebanon (8%) and Kuwait (5%).
- **Language Breakdown:** English is the dominant language on Instagram with more than 55% of Instagram activities taking place in English in the region. Meanwhile, Arabic has a 37% share.

2.4.1. Instagram Usage in the Arab Region

After merging with Facebook, Instagram has grown to become a leading photo-sharing social media platform in the region. According to our research, it now has more than 7.1 million active users with a 1.8% penetration rate among the population of the region.

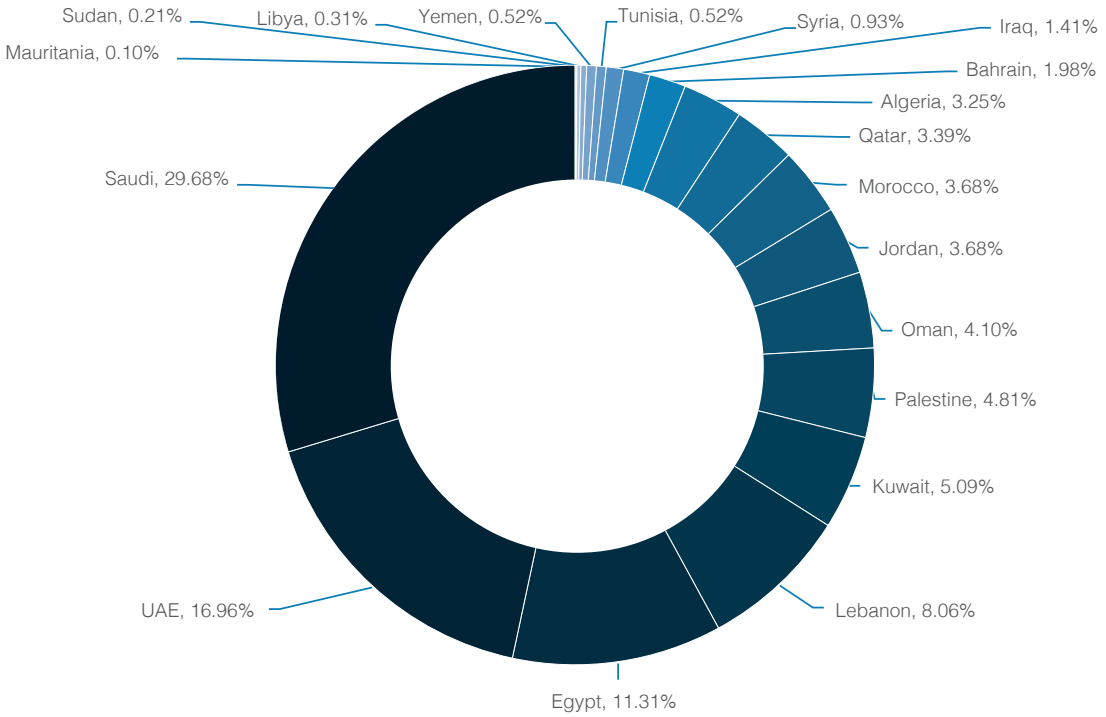
Four countries exceed the regional average in terms of the number of active users in each. The largest number of active Instagram users are in Saudi with 2.1 million active users. This is followed by the UAE with 1.2 million, Egypt with 800 thousand active users and Lebanon with 570 thousand.

Number of Instagram Users in the Arab States (Oct 2016)



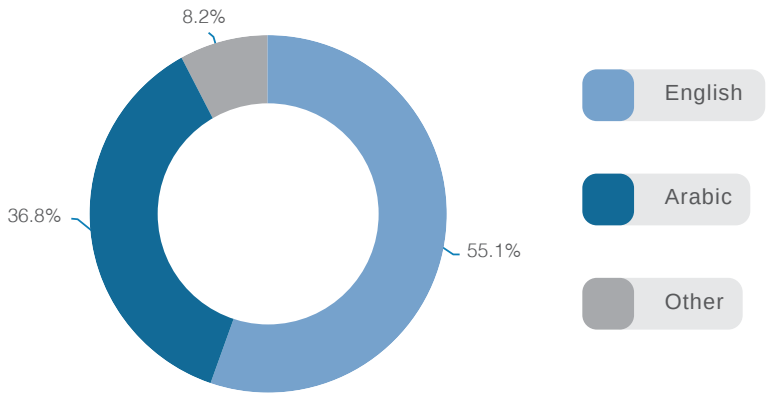
In terms of penetration rates, the UAE leads the region, with around 13% of its population active on Instagram. It is followed by Bahrain, Lebanon, Qatar and Kuwait. The regional average of country penetration rates stands at 4.1%. Meanwhile, almost half of all Instagram users in the region are based in Saudi and the UAE (total of 47%). Saudi Arabia has the largest share of Instagram users in the region at around 30%.

Distribution of Instagram Accounts in the Arab States (Oct 2016)



While Arabic language use on social media is growing across most platforms in the region, Instagram usage in the Arab region is still dominated by English, with 55.1% of activities taking place in English and around 37% in Arabic.

Language Use on Instagram in the Arab region



2.5. Regional Overview: Social Media in the Arab Region

Social media usage continues to grow rapidly across the Arab region, impacting societies, economies and governments. A comparative analysis of the penetration rates of different social media networks in the Arab region highlights that Facebook remains the most popular platform, and the fastest growing one. Meanwhile, despite its influence on the media scene, Twitter's penetration in the region remains relatively small. However, Instagram is the medium with the smallest penetration rates in the region among the four social media platforms analyzed in this research project.

The UAE tops the region in terms of both LinkedIn and Instagram penetration rates. Qatar ranks highest in terms of Facebook penetration, followed closely by the UAE. Meanwhile, Bahrain leads the region in terms of Twitter penetration rate.

The UAE tops the region in terms of both LinkedIn and Instagram penetration rates. Qatar ranks highest in terms of Facebook penetration, followed closely by the UAE. Meanwhile, Bahrain leads the region in terms of Twitter penetration rate.

Facebook has continued to see growth in all countries in the region, other than Palestine and Syria which saw drops over the past few years in numbers of accounts. The most significant growth on Facebook was registered by Egypt, Algeria and Iraq. Yemen and Oman saw a rebound in growth rates after a slump a year earlier. Qatar, the UAE and Algeria had the highest growth as percentage of the population.

The gender gap on social media in the region remains a chronic issue over the past six years.

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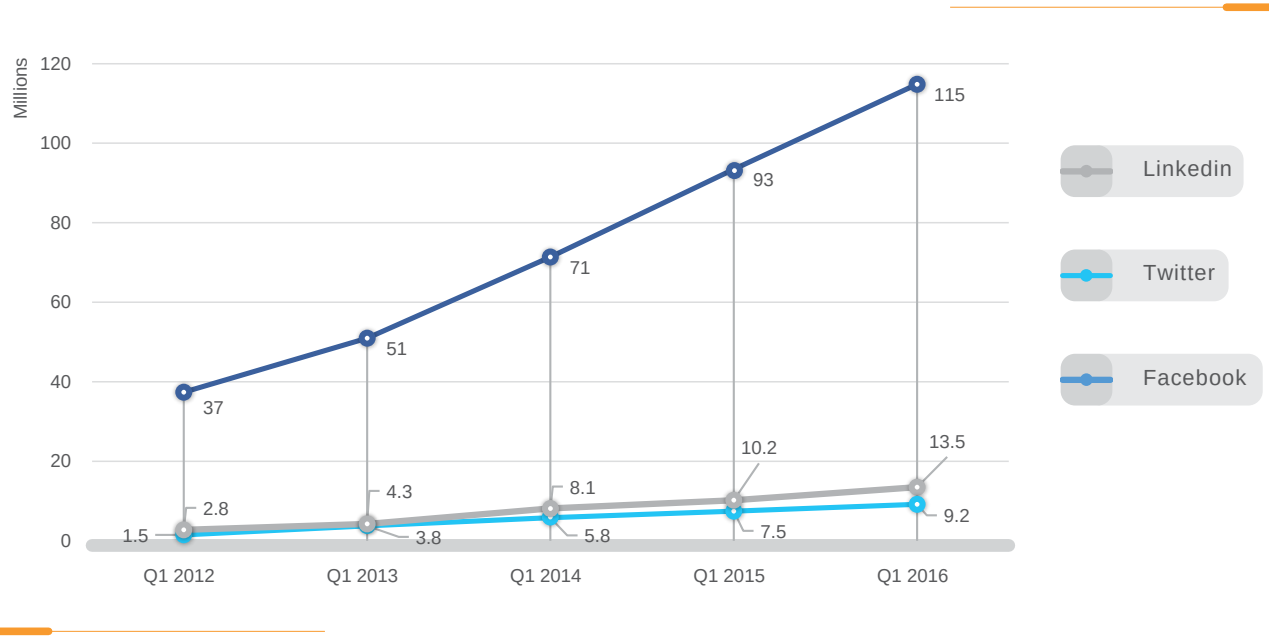
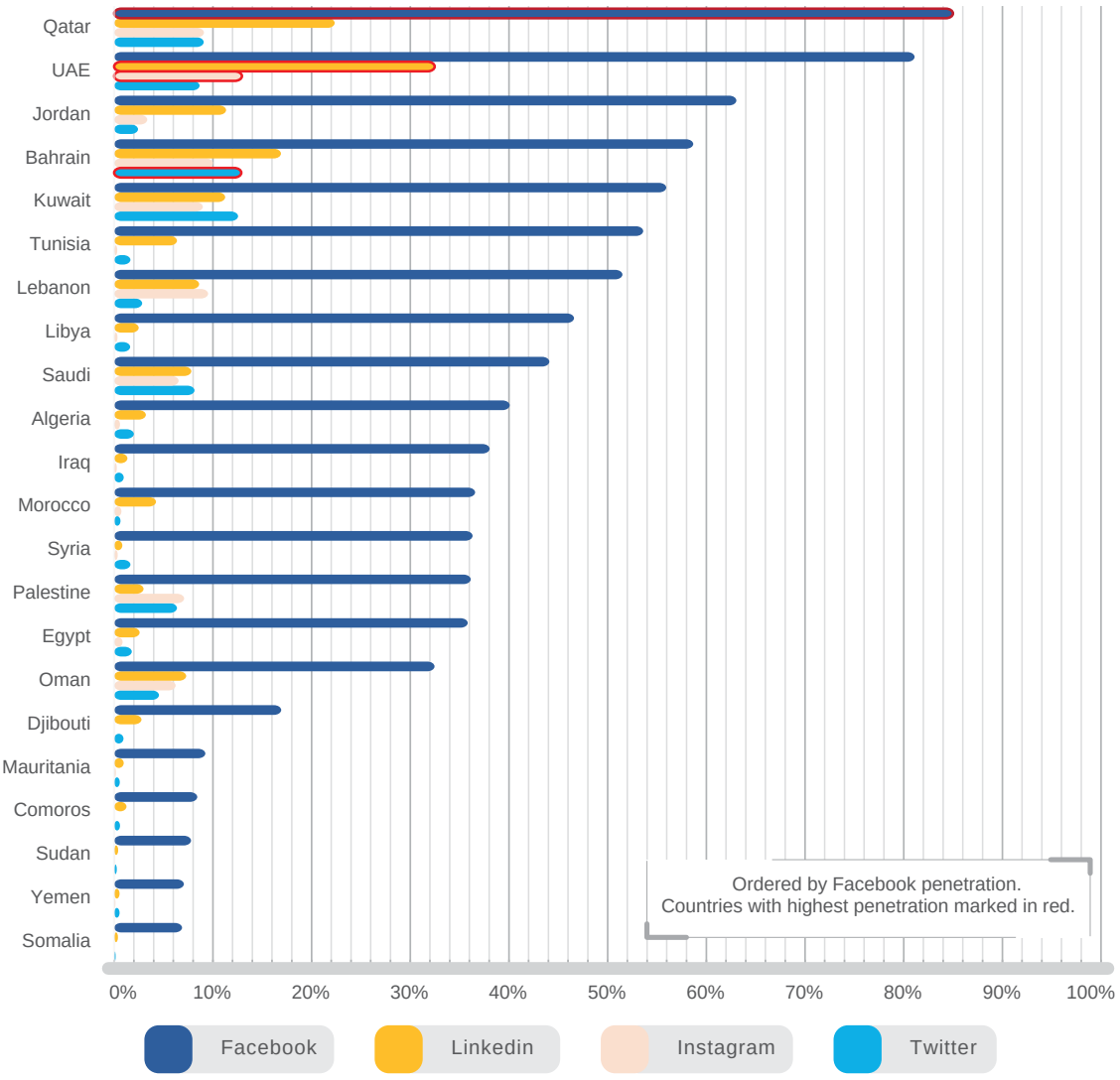
The gender gap on social media in the region remains a chronic issue over the past six years. Female participation in the region on all social media platforms, including Facebook, Twitter and LinkedIn remain well below the global average. On average, only one in three users in the region is a woman.

However, social media users are maturing in the region. There is a noticeable and steady increase in the number of users above 30 years old over the past six years.

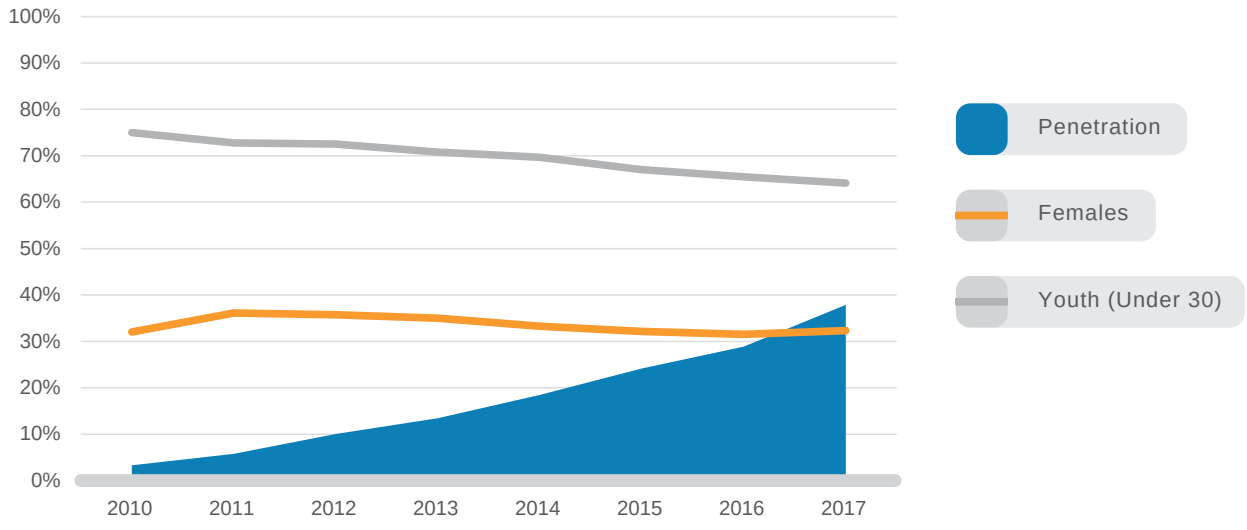
Social Media Growth in the Arab Region between 2012-2016: Facebook, Twitter and LinkedIn as Examples



Penetration Rates of Social Media Platforms in the Arab States in 2016 (as % of population)

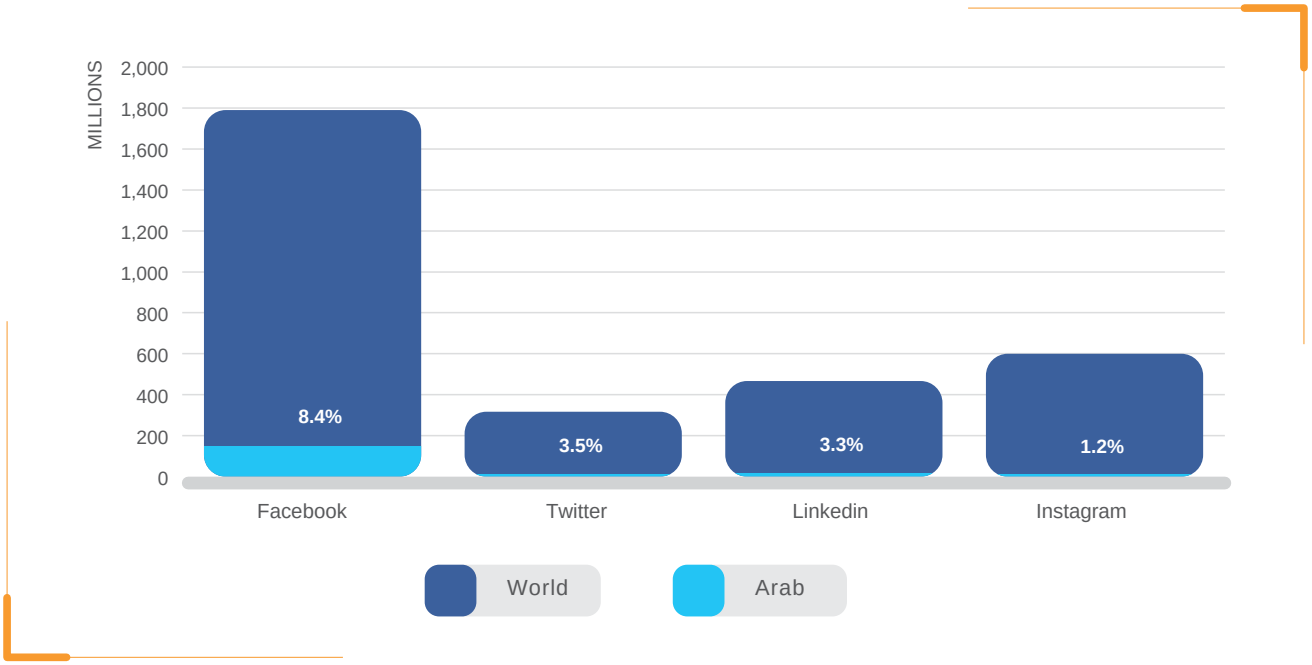


Facebook in the Arab Region Between 2010-2017: Penetration Rates, Youth and Women



The population of the Arab region is estimated at 400 million in 2016 according to the UN Population Prospects data. As such, the region hosts around 5.4% of the total population of the world. In comparison, Facebook users in the Arab region are overrepresented in the global Facebook population, with 8.4% of all Facebook accounts around the world being in the Arab region. On the other hand, Twitter, LinkedIn and Instagram accounts in the region are underrepresented, with 3.5%, 3.3% and 1.2% respectively.

Users of Social Media Platforms in the Arab Region as Percentage of Global Users (2017)

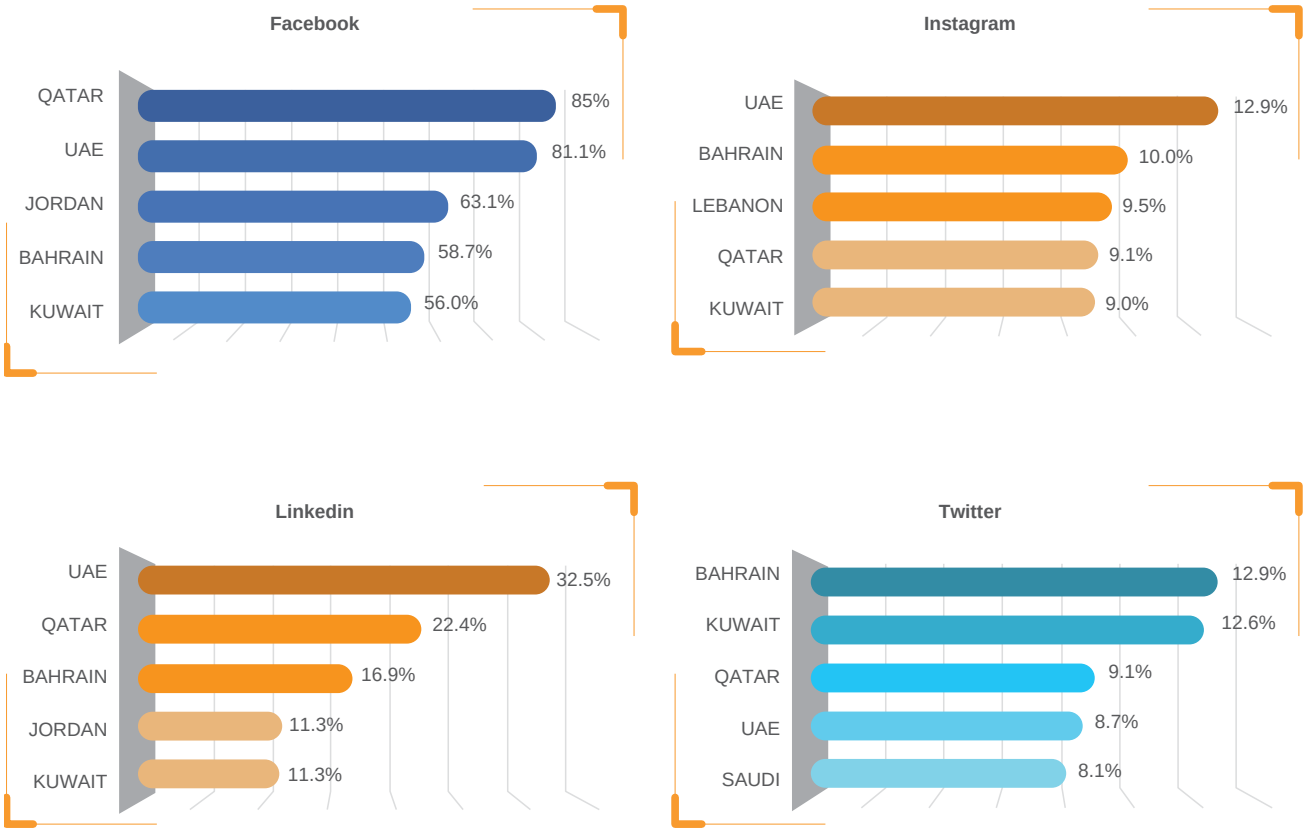


2.5.1. Social Media in the Gulf

Within the Arab world, the leading region in terms of social media use and penetration is the Gulf region. The six countries of the Gulf Cooperation Council (GCC); Bahrain, Kuwait, Oman, Qatar, Saudi and the UAE, have maintained their regional lead in terms of penetration of social media among their populations and their share of social media population across the region. The Top Five spots in terms of penetration rates in the region on all four platforms studied here are largely dominated by Gulf countries. Jordan and Lebanon are the only two countries appearing in the top five spots occasionally (Jordan 3rd on Facebook and 4th on LinkedIn and Lebanon 3rd on Instagram). Every single country occupying Twitter's top five spots in terms of penetration is a Gulf country.

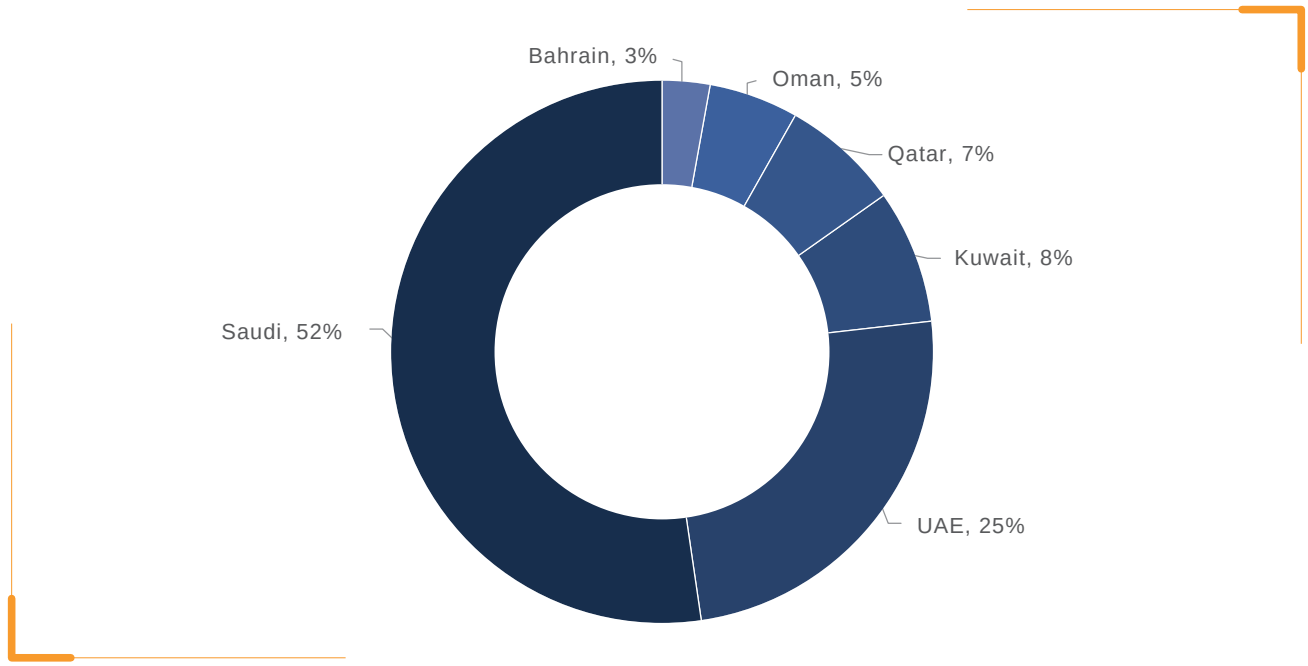
The Top Five spots in terms of penetration rates in the region on all four platforms studied here are largely dominated by Gulf countries.

Top 5 Countries in the Region in Terms of Penetration Rates in 2016 on Facebook, Twitter, LinkedIn and Instagram (as % of population)

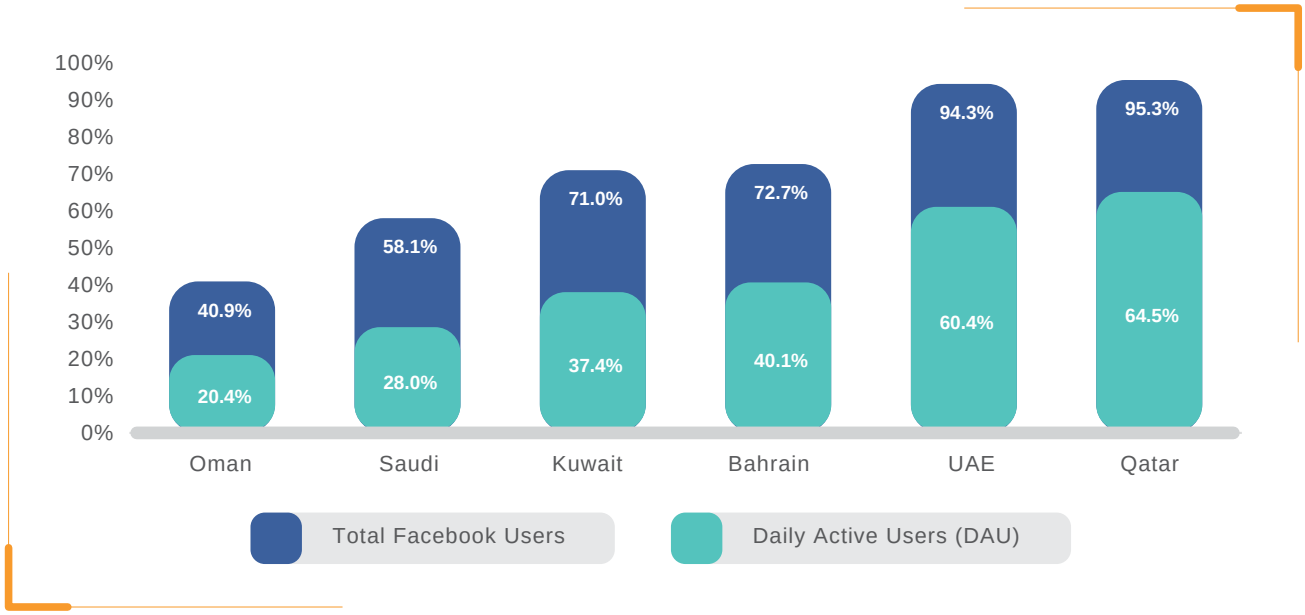


Within the Gulf, Saudi also slightly increased its majority share of Facebook users. By 2017, around 52% of all Facebook users in the Gulf were based in Saudi, up from 49% in 2014. This increase in Saudi's share was primarily at the expense of the UAE, whose share of the total users in the Gulf has dropped from 28% in 2014 to 25% in 2017. Meanwhile, very limited change in terms of distribution of Facebook users was observed in the rest of the four remaining GCC countries.

Distribution of Facebook Users in Gulf Region (2017)



Penetration of Facebook Daily Active Users and Total Facebook Accounts in the Gulf Region out of the Total Population (2017) - (Penetration out of total population)



The levels of activity of Facebook users in the Arab region is very similar across the different regions. Users in the Gulf region are slightly more active than the Arab average. Around 54.1% of Facebook users in the Gulf are active daily, compared to 52.8% in the Arab region. However, the penetration of daily active Facebook users in the Gulf region out of the total population of that region stands around 35.7%, which is considerably higher than the Arab regional average of 19.6%. In other words, while 2 out of each 3 persons in the Gulf own a Facebook account (66%), only 1 out of 3 persons (35%) uses that account on daily basis. In contrast, in the Arab region, around 1 out of 3 persons owns a Facebook account (37%). Meanwhile only 1 out of 5 persons (19.6%) use that account on daily basis.

2.5.2. Concluding Remarks: Localization, Maturity and Gender Imbalance

Finally, the findings of this edition of the Arab Social Media Report series on the trends of social media growth in the region can be summarized as follows: 1) The Arabic language is increasingly dominating the social interactions online, as these channels are becoming the de facto form of interaction for the masses in the region. This is a departure from the earlier stage of growth where this was merely the interaction medium of the "elites" in most societies. 2) Access and utilization of these interconnected informational spheres are no more limited to the youth in Arab societies. Their inhabitants are increasingly maturing in terms of age, as well as in the ways they utilize these platforms in their daily life. 3) However, as the influence of these mediums grow, the one persistent point of concern is the regional inequality in terms of gender representation online. For almost seven years, women in the Arab region have not gained a representative voice online, nor managed to increase their share of the digital space in the region. They remain underrepresented on social media across the spectrum of channels and around the region. While this series has provided exploratory research on the reasons of this regional imbalance, digging deeper into the barriers and drivers of this critical matter should be viewed as a priority for governments and societies in the region. As decision-making and policy decisions by governments and businesses in the region are increasingly becoming digital and data-driven, the underrepresentation of women in the region in the data-driven economy will undermine the potential economic growth as well as the opportunities for better governance and development.

For almost seven years, women in the Arab region have not gained a representative voice online, nor managed to increase their share of the digital space in the region

3.

Annex 1: Methodology

Notes on the Population:

Population at the Country-level: In calculating penetration rates, the UN population estimates were used. Using the UN's definitions, the total population of the Arab region used in our research comprises persons of all ages who were living in the country during the reference period, regardless of residency status or citizenship. The population data for the year 2016 is based on projections by population figures used is the latest edition of the UN's World Population Prospects: The 2015 Revision, issued by the United Nations.

Palestine: Based on the population estimates by the UN of the State of Palestine, the population used here includes those living in Gaza, the West Bank and East Jerusalem.

Sudan: The population of Sudan used here does not include those living in South Sudan.

Syria and Yemen: Over the past few years, three countries in the Arab region witnessed significant population drops according to international organizations data, due to wars, civil strife and political divisions. These countries are: Sudan, Syria and Yemen. Syria witnessed at least a 11% drop in its population in shape of forced migration according to refugee relief organizations under the UN umbrella. Sudan also had around 24% drop in population due to the separation of South Sudan in 2011. Yemen's population has dropped by at least 1% as refugees fled the country due to war since 2015. The three countries have seen drops in the numbers of social media users across different platforms during the past few years at different stages. Most likely this is related to decrease in the actual population in these countries.

Facebook

The demographic data of Facebook users in all 22 Arab countries, was collected periodically between October 2015 and January 2017. This data included language, gender breakdowns, and age breakdowns in the following age brackets: (15-29) and (30 and over).

The data collection methods followed two approaches based on grouping the 22 Arab countries into two groups. The raw usage data on all Arab countries was collected and aggregated based on Facebook's official data in group A, which included all countries in the region excluding Syria and Sudan (both were included in group B), for which data was estimated based on historic unofficial data. This grouping was necessary as persistent technology export sanctions imposed by the US authorities have affected data availability on certain countries in the region, including Syria and Sudan.

As such, for all charts in this report, the numbers of Facebook users in Syria and Sudan are estimates, while the numbers for remaining countries were

compiled based on actual Facebook usage data collected using different methods.

The estimates of the number of Facebook users in Syria are based on a historical baseline of actual usage data first collected in November 2007. All Facebook data on Sudan in this report was estimated using the average regional daily growth rate of Arab users. This was calculated based on regional trends of countries in Group A over the following different phases of research in this series: 1) between January and April, 2011; 2) between January and April, 2012; 3) between January and February 2013; 4) August and November, 2013; 5) January and May 2014, and 6) January 2016 to January 2017). These growth rates were used to calculate the number of users in Group B countries.

For Syria, the daily growth rate was adjusted occasionally based on different events, such as blockage of certain platforms, Internet connectivity issues in the country as well as political events related to the Syrian conflict starting March 2011. This baseline growth rate was based on the average daily growth rate in Yemen, a country that has similar ICT and socio-economic indicators compared to Syria, as well as being a country with similar ongoing popular movements and military conflict influencing—and influenced by—social media activities. In addition, a one-off factor was added to the calculation of the Syria growth rate after lifting the ban on social media websites on February 7, 2011, when social media platforms, including Facebook and Twitter, were no longer blocked in the country, a higher estimate of daily growth rate was used to reflect the surge in growth number of Facebook users. This was estimated based on the surge in number of Facebook users in Egypt after a similar Internet ban was lifted on 2nd February 2011. Similarly, the average daily growth rate for Yemen was re-adjusted at several points in time and applied to generate the data related to users estimates in Syria.

Twitter

The study was conducted using a customized application based on Twitter's API. The process included mass scraping of publicly available Twitter data and conducting different rounds of analysis. Estimations of populations, trends, gender breakdowns of Twitter users as well as language usage in each country were then carried out. The Twitter data was collected primarily in the month of March 2016, by collecting 1% of all tweets generated during that period, based on the Twitter "firehose" stream by collecting roughly every 100th tweet. This generated around 31 million tweets as a basis for our data analysis. This provides a dataset as close as it gets to a truly random sample of all tweets generated.

The Twitter data stream was then filtered to locate tweets generated in all 22 Arab countries. An unbiased distribution of tweet frequency was obtained by random sampling of the user space. Geo-locating users (estimating the location or country from the data) was done by filtering tweets with location information using a combination of methods based on 1) Yahoo and Google's geolocation services, 2) a local database, 3) profile information provided by the users, and 4) latitude/longitude coordinates when available. The process included additional clean-up steps. Random sampling of users was applied using Twitter users' numerical ID. As such, two sampling methods were used: 1) Trends and volume data was collected by sampling 1% of the whole of Twitter traffic, and filtering for location. 2) Users were sampled by randomly inspecting user ID numbers. This allowed for gathering information on both active and inactive users.

The population estimates were produced from combining these two data sources: sample (2) provided information on user behavior, which helped assess the fraction of the Twitter population that was collected in sample (1). A correction was then applied for "un-locatable" Twitter users in each country. Population estimation was done by estimating the probability of locating the appearance of a given user in the stream, given the sampling period, tweet-frequency distribution, and the stream behavior as witnessed in the 1% sample of tweets. In some cases, an additional correction was applied for un-locatable users in some countries, to incorporate the number of virtual private network (VPN) users that may have been incorrectly geo-located by passive web analytics. However, as IP addresses were not used as a source of geo-location, the use of VPNs or other methods had limited effect on determining the location of users.

Gender data was inferred based on textual analysis of publicly available personal information shared by accounts holders on their accounts. The names and username provided is compared to official census data to identify the gender of each user. Additional correction techniques were applied such as correcting for common names "shortening", different spellings and styles, uses of titles, and the use of other common gender markers in user-reported information

such as profile descriptions. In cases of "un-gendered" accounts or in cases where gender categorization is irrelevant or not applicable (e.g. for accounts held by institutions), these accounts were ignored in the gender analysis. Therefore, only actual accounts held by individuals were analyzed in assessing the gender of users.

Language was detected using a language-detection algorithm developed by Google. Self-reporting of language from Twitter settings, was also included in the analysis when available, however this was seen as unreliable due to limited number of users accurately providing this optional information. Each user was assigned one language. As such, users using multiple languages in their tweets, were assigned to the language they used most.

Finally, the methodology followed in this report has been fine-tuned over six years to overcome issues continuously emerging from technological changes made to social media platforms. While all possible measures have been taken to minimize errors, these experimental methods may be subject to unintended sources of error, such as measurement, technological and coverage errors. In certain cases, limited data availability, coupled with abrupt geopolitical events in the region related to Internet governance, access and usage behaviors may play a role in infusing some measurement errors. To ensure validity, the data gathered has been benchmarked and validated against numerous alternative sources, including official and third party source when possible.

LinkedIn

The number of LinkedIn users in all Arab countries, excluding Syria and Sudan were collected periodically between January 2016 and January 2017. These included gender breakdowns, and age breakdowns in the following age brackets: 18-24, 25-34, 35-54, 55 and above.

Usage data for Syria and Sudan were estimated using a baseline of actual breakdowns of regional usage data obtained from comparable professional social media platforms. The usage data and proportions of users in both countries were used as a baseline to estimate the proportion of users LinkedIn for each of the two countries.

Instagram

Data collection for Instagram were conducted in July 2016 by collecting over 750,000 randomly sampled users on Instagram during that period. The last 5 Posts of each user were then scraped, including captions, location data when shared by users.

Location was further extracted using multiple methods, including GPS location associated with shared photos which then help determine the country. Other information provided by users are assessed for location-related information including user's other social media accounts, such as Twitter username among others. Language was determined from the posts collected using the same process as for Twitter. Similarly, gender was inferred using the approach followed for Twitter data.

Regional Survey

The regional online survey was administered in 22 Arab countries and ran from September to December 2016. The survey represents views of those who are actual Internet users in the region. Close to 19 thousand people took the survey. Out of those there were 5,530 successfully completed responses from the targeted region; a response rate of around 30%.

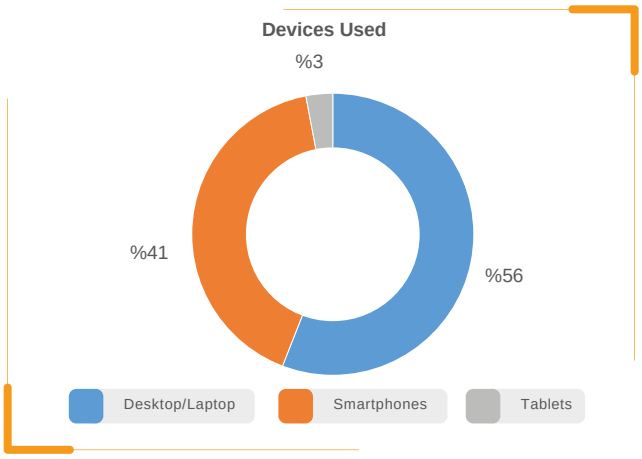
More than 74% of respondents chose to complete the survey in Arabic and 26% in English. Around 56% of respondents completed the survey using a desktop or laptop computer, 41% using a smart phone, and 3% using a tablet.

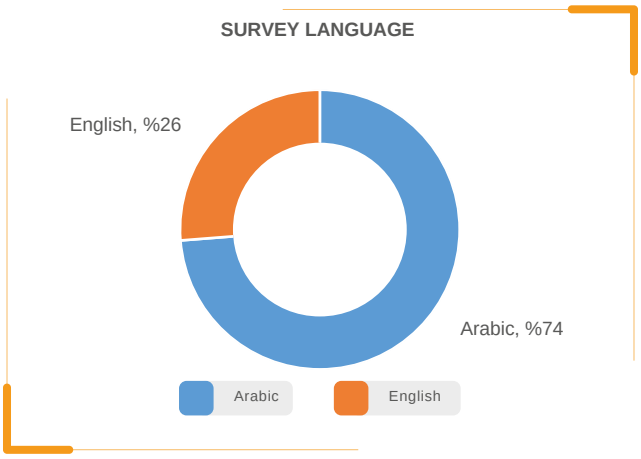
The sample was largely representative of the demographic breakdown of Internet users in the region. Around 81% of respondents lived in cities. Around 25% said that they are unemployed, 15% worked in the public sector and 37% in the private sector. In terms of age, 46% of respondents were under 30 years old, and around 31% of respondents were female and 69% were male.

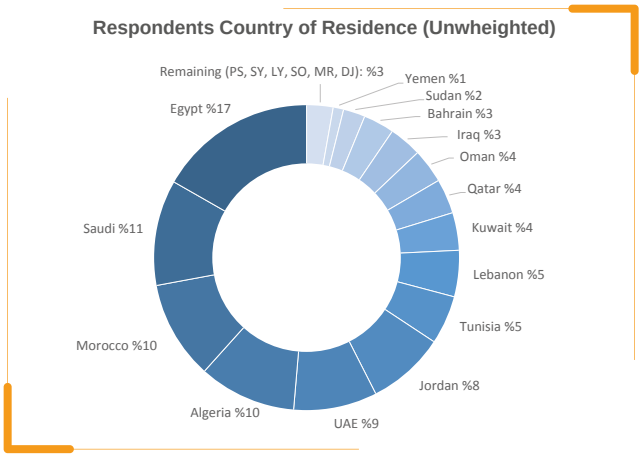
In some cases, respondents were divided into country income brackets, as per the World Bank's classifications. These corresponded to:

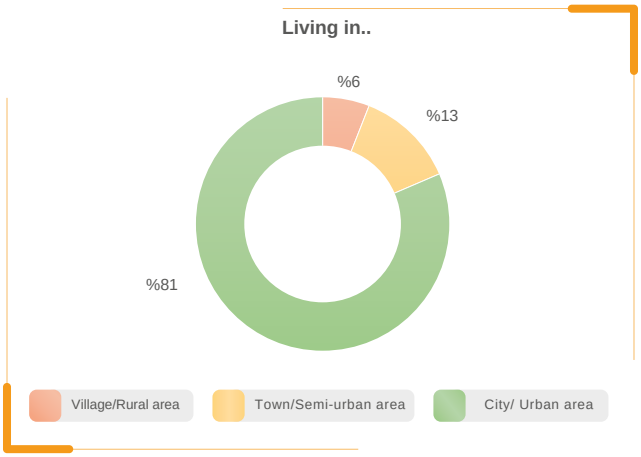
- High Income: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
- Upper Middle Income: Algeria, Iraq, Jordan Lebanon, Libya, and Tunisia
- Lower Middle Income: Egypt, Mauritania, Morocco, Palestine, Sudan, Syria and Yemen
- Low income countries: Comoro, Djibouti, and Somalia.

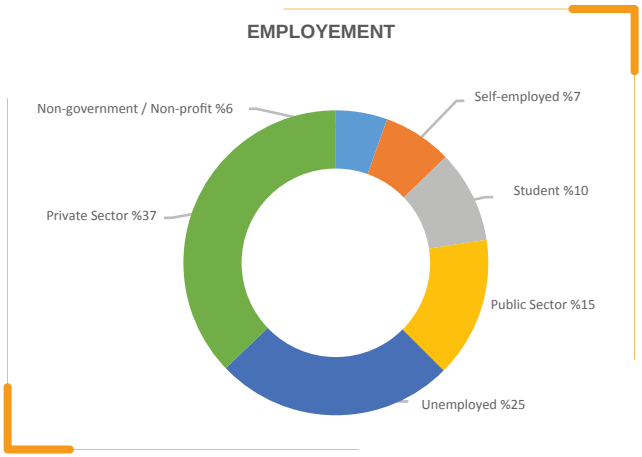
The following charts provide additional information on the demographics of the survey respondents:

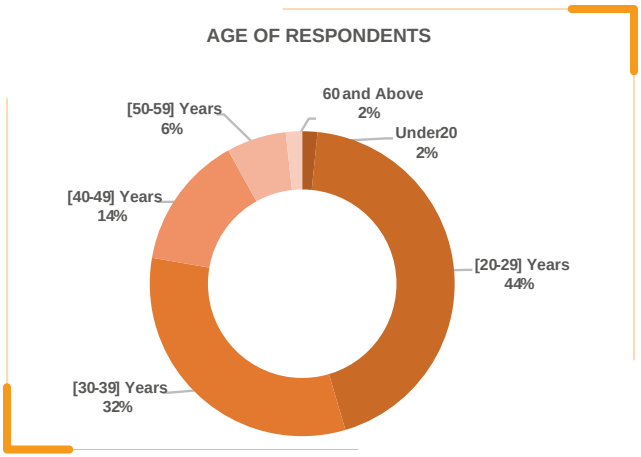


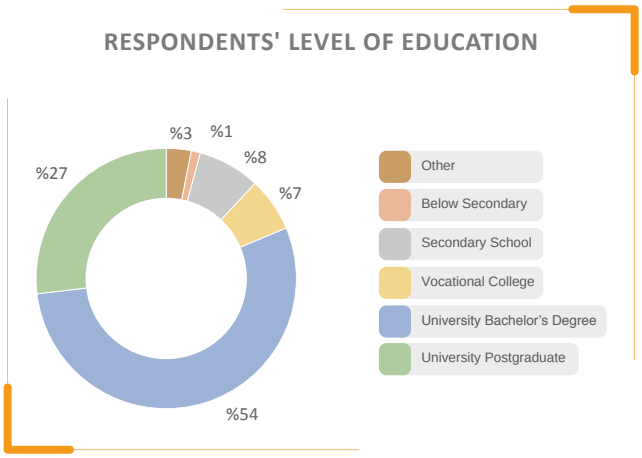


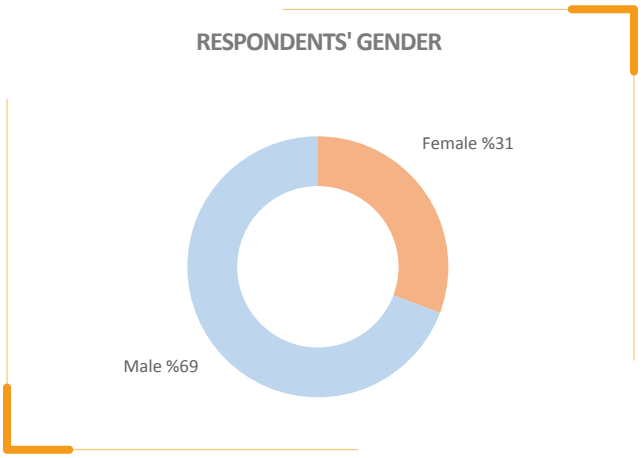












4.

Annex 2:

Additional Data

The content of Annex 3 is available exclusively for members of the ASMR community online on the ASMR website: **www.ArabSocialMediaReport.com** You can join the Arab Social Media Report community online. Registration (at no cost) will give you access to additional datasets and unpublished charts and enable you to get updates on future editions of the report.

5.

Annex 3:

Definitions

The definitions used in this report, such as “social media”, “Internet of Things” (IoT), “Big data”, and others, are created and adapted from dominant definitions used by established scholarly and policy literature. There are numerous definitions of each of these terms in policy, technical and academic sources. Primarily, the following definitions informed the conceptualization of each of these terms used in this report:

Social Media:

1. Social media are Internet-based applications that facilitate 1) the creation of structured networks of connected individuals, entities or virtual objects based on social attributes, and 2) facilitate multiple interactions between the nodes of these social networks, including the creation and sharing of content by users.

– The Arab Social Media Report 2017, MBRSG

2. Social media are web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others.

– The World Economic Forum 2016

Internet of Things (IoT):

3. All devices and objects whose state can be read or altered via the Internet, with or without the active involvement of individuals.

– The OECD 2015

4. The network of physical objects or ‘things’ embedded with electronics, software, sensors and network connectivity, which enables these objects to collect and exchange data

– The UN / ITU 2016

Big Data:

5. Big data are data sources with a high volume, velocity and variety of data, which require new tools and methods to capture, curate, manage, and process them in an efficient way

– The UN DESA Working Group on Big data 2014

6. Big data means large data sets that have different properties from small data sets and requires special data science methods to differentiate signal from noise to extract meaning and requires special computer systems and power

– The Data Science Association 2016

7. Big Data is a paradigm for enabling the collection, storage, management, analysis and visualization, potentially under real-time constraints, of extensive datasets with heterogeneous characteristics.

– The International Telecommunication Union 2016

6.

Authors, Contacts and Citation

The Arab Social Media Report series has been produced since 2011 by Governance and Innovation Program at the Mohammed Bin Rashid School of Government (formerly Dubai School of Government).

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You can use materials included in this report as long as you follow proper citation and referencing. To cite this report please use the following format:

Salem, F. (2017). The Arab Social Media Report 2017. Arab Social Media Report Series (Vol. 7). Dubai: Governance and Innovation Program, MBR School of Government.

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To access additional datasets and charts, not published in this report, join the Arab Social Media Report (ASMR) community and register (at no cost) online at: www.ArabSocialMediaReport.com Non-registered members can download the full report, and follow the ASMR social networking groups through the website.

7.

Acknowledgements

Appreciation

The author wishes to express personal appreciation to the following individuals for their input to the different stages of producing this report and for providing essential contributions, input and assistance into the report and its related materials:

Daniel Winterstein

Maryam Minhas

Ghaith Yagan

Tara Fischbach

Marwah Alantali

Yusra Alagha

Sarah Alshaer

Engy Osman

Salha Bu-Kattara

Marouen Ghezal

Special Acknowledgement

The author would like to acknowledge the valuable contribution of Bayt.com and its team to the data collection efforts while conducting the survey. Specifically, we would like to thank:

Hatem Hannoun

Batool Al-Jboor

Lama Ataya

Rana Nseir

Hedel Frank

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- **Policy Advisory:** The ultimate objective of the Program is to inform present and future Arab policy makers in assessing the impact of the ongoing transformations in their societies and governments; and to help develop locally fitting policies for future governance initiatives.
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7th Arab Social Media Report 2017 Edition