

The prevalence of third-party services on Danish websites

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Summary

The report is based on an analysis of more than 11,000 .dk websites' use of third-party services. Third-party services have different functions on a website, such as protecting the website from cyber attacks, targeting adverts or displaying cookie banners. When a website uses a third-party service, data about the website visitor is automatically sent to the third party, as it is necessary for the service to function. However, this also means that there is a likelihood that the third-party service may use this data for various purposes, e.g. marketing, user profiling, etc. which requires the user's consent.

The analysis itself is divided into four different chapters, each with its own focus. Finally, there are a number of recommendations for website owners to help them get an overview of which third-party services they use.

The results of the analysis reflect the third-party services that the website uses even before the website visitor has considered whether to consent to the use of cookies and similar technologies or has navigated around the website. The report does not analyse whether the third-party services used require consent from users. It will thus require further investigation of the results to assess which third-party services are specifically used for purposes that require the user's consent.

Tech giants dominate

Almost all of the analysed websites (97%) use at least one third-party service, and among these websites, two third-party service providers are particularly popular. 88% of the analysed websites use third-party services from Alphabet, who owns Google and YouTube, among others. In addition, 34% of the analysed websites use third-party services from Meta, who owns Facebook and Instagram, among others. The use of third-party services from Meta is largely due to the fact that these websites use Meta Pixel, which is used to market a product, such as a pair of shoes, on Facebook that the user has already viewed on the website in question.

Third-party services from all over the world, but especially the US

As there may be different rules and guidelines for data use in different countries, it is relevant to be aware of which countries the third-party services are based in. If a third-party service collects and uses data from your website, there is a risk that the data will end up in these countries. Almost all websites (93%) use third-party services from the USA, while 46% of the analysed websites use third-party services from Denmark. In addition, a small number of Danish websites use third-party services from countries outside Europe, such as Canada, India and China.

Danish public sector websites stand out

89% of the analysed Danish public websites use at least one third-party service. Among these, 47% of Danish public websites use third-party services from Alphabet, while only 2% of Danish public websites use third-party services from Meta.

Recommendations for website owners

As a website owner, you can do the following if you want to deal with the third-party services that you use yourself:

- Get an overview of your third-party services by looking into the structure of your website.
- Check if they are third-party services that you actually use and if their use requires the visitor's consent.
- Actively assess your third-party services. Here you can research the company behind it and how it deals with issues such as digital security and data ethics.

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Introduction

1. Introduction

Danish society and Danish companies are among the most digitalised in the world, and the development only goes one way. With increasing digitalisation comes a wide range of benefits such as innovation, growth and greater digital accessibility between people, businesses and authorities. At the same time, digitalisation and the use of new technologies also create challenges that can be difficult to navigate for those who have to use the technologies.

When building a website, website owners often use components and services offered by third parties. These can be video players, fonts and social media feeds, and what these services have in common is that they enable websites to be customised to suit your needs. On the other hand, as a website owner, you run the risk of sending data about your website visitors to the owners of these services. It can be difficult for website owners to know when data is being sent, partly because the structure of the services can be technically complex and the contractual terms can be difficult to understand. At the same time, it can be difficult to understand who owns the third-party services, and there is limited knowledge of where in the world the data ends up.

Method

The report is based on analyses of approximately 11,000 websites, where it has been investigated which cookies are set and what content, such as images, fonts and scripts, are downloaded to the website from third parties.

All of this is registered immediately upon visiting the website in question, i.e. before the user has taken any action on the website, including, for example, accepting or rejecting the website's use of cookies and similar technologies. The analysis therefore does not show which third-party services and associated content are enabled when after the website visitor has consented or refused to consent to the use of cookies or when the website visitor navigates around the website, e.g. visits subpages. The focus has been on conducting a large, representative analysis that provides a picture of which third-party services are used on Danish websites and where data about website visitors ends up. The analysis focuses predominantly on the use of third-party content, such as images, fonts and scripts, and not just third-party cookies. Not all third-party services work with cookies, and it is therefore necessary to look at all third-party content to get a more accurate insight into the use of third-party services.

The analysis does not show how much data each third party can obtain about the visitors to the website. The scope of data may vary depending on the type of third-party content, and therefore the report does not assess whether the use of third-party services identified in the analysis is in violation of the rules in the area.

For an in-depth explanation of the specific scope of data collection, please refer to the report "*An everyday life of data*", prepared by Analyse & Tal on behalf of the Danish Data Ethics Council. The report from Analyse & Tal and the Danish Data Ethics Council focuses on the amount and type of data that an app can collect about its users, which is why it works well as a supplement to this report.

Concepts and terms

Third-party service

A third-party service is a service from an external provider that a website owner can use when building their website. Third-party services can be used to provide various things to the website, such as security measures, analytics tools, media players, images and fonts.

Third-party domain

A third-party domain is the domain that a third-party service uses to deliver content from, such as images, scripts and fonts, and in some cases cookies.

Third-party content

Content on a website, such as images, fonts or scripts obtained from a third-party domain. Third-party content can also be content that directly aims to collect data about the visitor, such as pixels.

Cookies and similar technologies

Cookies and similar technologies that can access or store information on the user's terminal equipment are regulated by the Danish Cookie Law. Cookies are placed in the visitor's browser until they are deleted or expire and can be used by websites to remember things about visitors, such as whether they have chosen Danish or English language or how they move around the website. Similar technologies can be pixels that send data about the visitor back to the website itself or to a third party.

What do the rules say?

If you use third-party services on your website, you must do so in accordance with the rules in the Danish Cookie Law, which is the Danish implementation of the ePrivacy Directive, the rules in the General Data Protection Regulation (GDPR) and the Danish Data Protection Act.

The cookie regulation stipulates that the website owner must obtain the visitor's consent before using cookies and similar technologies, unless cookies and similar technologies are used for technically necessary purposes on the website. It is important to remember that the cookie rules only apply to the actual collection of information from the visitor's terminal equipment, such as a computer, tablet or smartphone. If personal data is involved, the processing, such as where the data is stored and what the data is used for, must be done in accordance with the GDPR. However, if it is a situation where a user enters information on a website, e.g. address, the data protection rules already apply here.

What is third-party content?

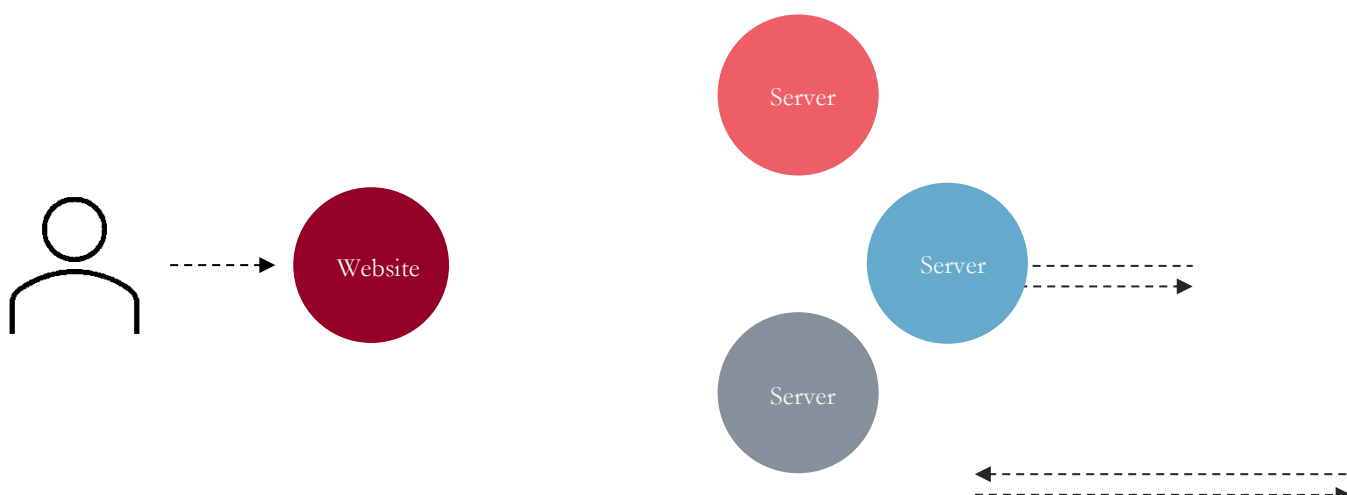
A website is dynamic and its content is only retrieved and loaded the moment it is accessed. This means that fonts, images, media players and other content are only activated when a person visits the website. The content can come either from the website owner's own server or from an external provider, i.e. a third party. If the content comes from your own server, it is called first-party content. Figure 1 shows how a website, when a person visits it, sends a request for that content (an HTTP request) to its own server, which then delivers the content to the website.

Figure 1: Obtaining first-party content



The situation is different if a website retrieves content from servers that are not its own. In this case, the content is provided by an external company, i.e. a third party, and is thus "third-party content". Figure 2 shows how a website, when a person visits it, sends a request for the content in question (an HTTP request) to an external server, which then sends the requested content back to the website.

Figure 2: Obtaining third-party content



Third-party services are popular with website owners because they can access content they do not have themselves or can achieve things they could not on their own, such as measuring website traffic, getting cookie banners, setting up security measures or targeting products directly to visitors.

One type of content that websites retrieve from third parties is images. This is partly because websites use third-party services that offer to supply images, such as logos, but it is also because some websites have embedded "pixels". A pixel is an image that is only 1x1 pixels in size, making it almost impossible to see with the naked eye. Pixels are therefore not an image, such as a logo or anything else that is intended for the visitor to see. Instead, pixels are simply used to obtain the IP address that is sent to the third party for content retrieval (see figure 2). Pixels can be used for the same purpose as a cookie, but differ in that they are not placed in the visitor's browser. This also means that the visitor cannot delete pixels as they can with cookies.

What data is sent when using third-party services?

When a website retrieves third-party content, it must first send a request to the third-party domain, and it is in this request that data about the specific website visit is shared. Specifically, this is data such as the visitor's IP address, the time of the visit, the name of the requested content, the URL of the visited website and the visitor's operating system. In specific cases where the content, e.g. a piece of Javascript code, is fingerprinted, additional information about the visitor's terminal equipment, e.g. browser settings, may be collected. This additional information is not part of the request itself and is only collected once the fingerprinting content has been loaded on the website in question.

Example of data included in an HTTP request:

IP: 185.153.154.186

DATE: [14/Jun/2023:15:31:15 +0000]

REQUEST: "GET /tracking_pixel.png HTTP/1.1"

REFERER: "http://website.dk/subpage"

**Tech giants
dominate**

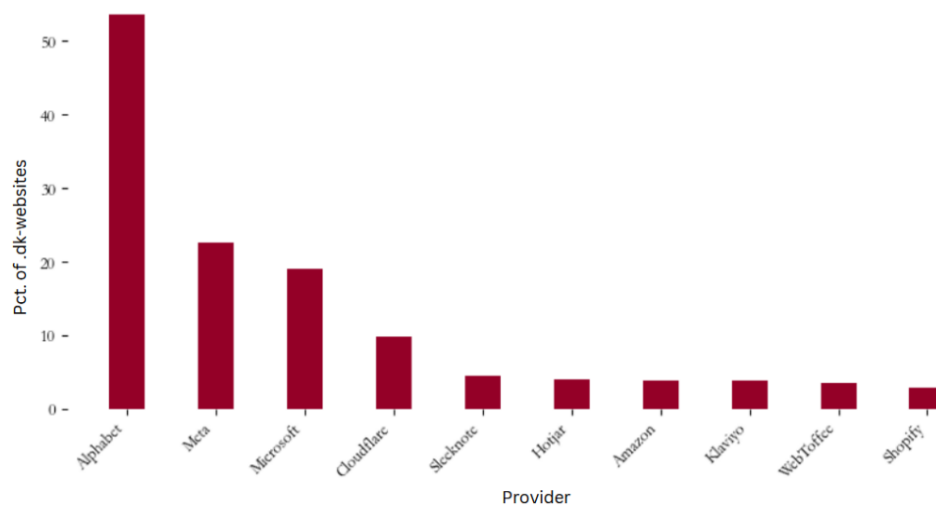
2. Tech giants dominate

This chapter describes the proportion of Danish websites that use third-party services. This is first examined by looking at the prevalence of third-party cookies. However, not all third-party services work solely via traditional cookies, and therefore the websites' use of third-party services is also examined by looking at other content, such as pixels, plugins, etc.

The results of the analysis show that 98% of the analysed websites use at least one third-party service. There is no doubt that third-party services are a widespread part of the architecture of Danish websites.

Some of the third-party services used work through the use of cookies. Figure 3 shows the cookie providers that have cookies on most .dk websites. There are cookies from Alphabet (Google's parent company) on 54% of websites and cookies from Meta (Facebook's parent company) on 23% of websites.

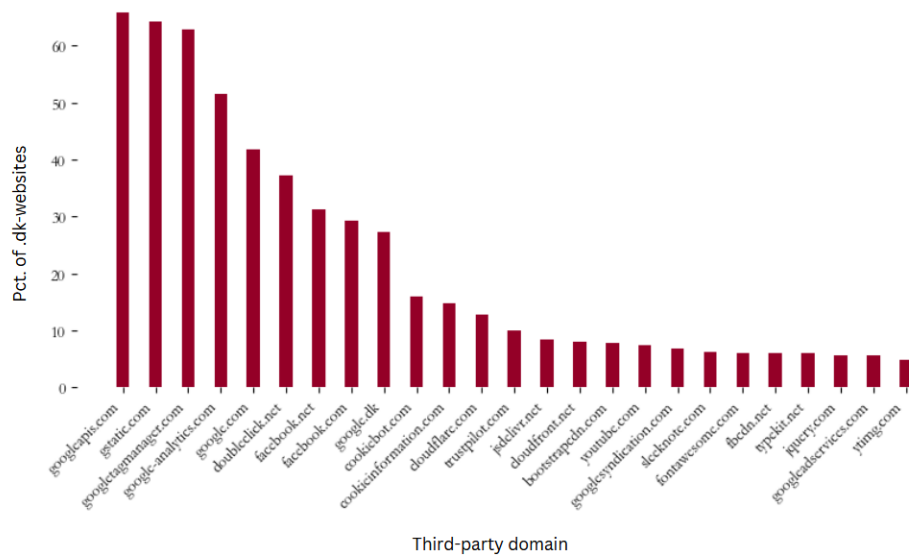
Figure 3: Top 10 cookie provider



It can be challenging to assess the extent of the use of third-party services when looking at cookies alone. This is because it is often not possible to link specific cookies to their respective third-party services, and it is not always possible to distinguish between first- and third-party cookies. However, you can get a better overview by looking at the use of other third-party content, such as images, scripts (code) and fonts. This type of content can be used to give the website the desired layout, e.g. images and fonts, but can also be used to collect data about visitors, as can be the case with pixels. Like cookies, these similar technologies can be used

for various purposes, such as cybersecurity, statistics and marketing. Figure 4a shows the three third-party domains that most .dk websites retrieve content from.

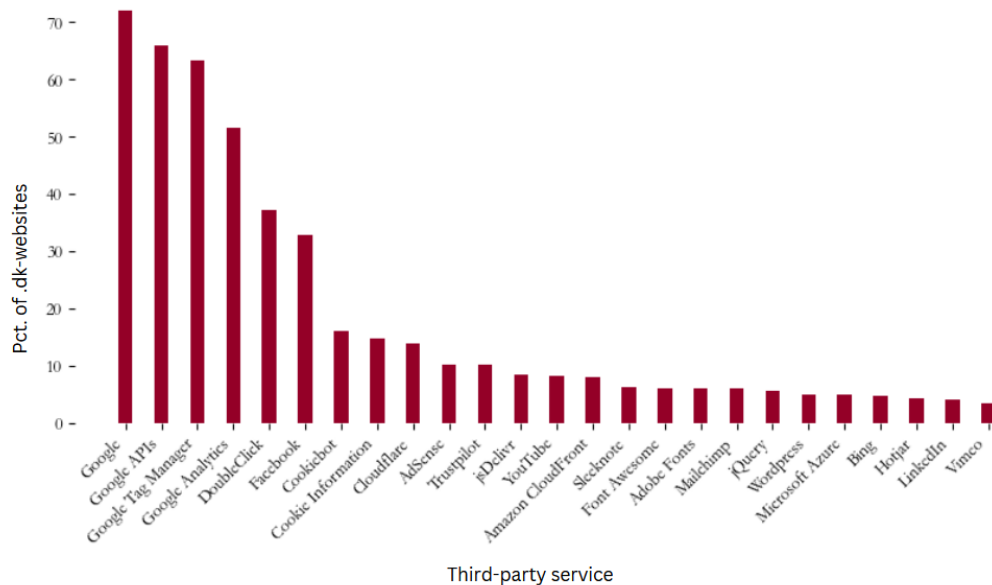
Figure 4a: Top 25 third-party domains



It is clear that only a few third-party domains have a significant penetration rate. For example, only the four most commonly used third-party domains have a prevalence of over 50%. At the same time, there are only 13 third-party domains that have a prevalence of more than 10%. In the analysis, a total of 4,151 third-party domains were found, and the overview in Figure 4a shows only the 25 most used third-party domains. The distribution of third-party domains can therefore be seen as a "long tail", where a few third-party domains have a significant presence, but where the majority of third-party domains have a relatively limited distribution.

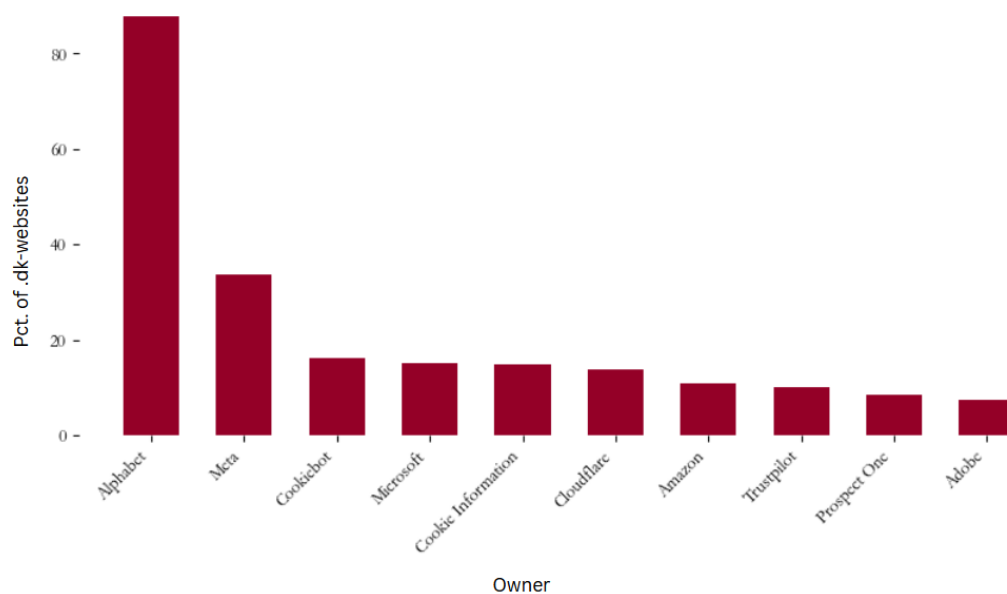
Multiple third-party domains can be associated with the same third-party service. For example, the domains "youtube.com" and "yimg.com" are both associated with the service, YouTube. Figure 4b shows the third-party services used on most .dk websites.

Figure 4b: Top 25 third-party services



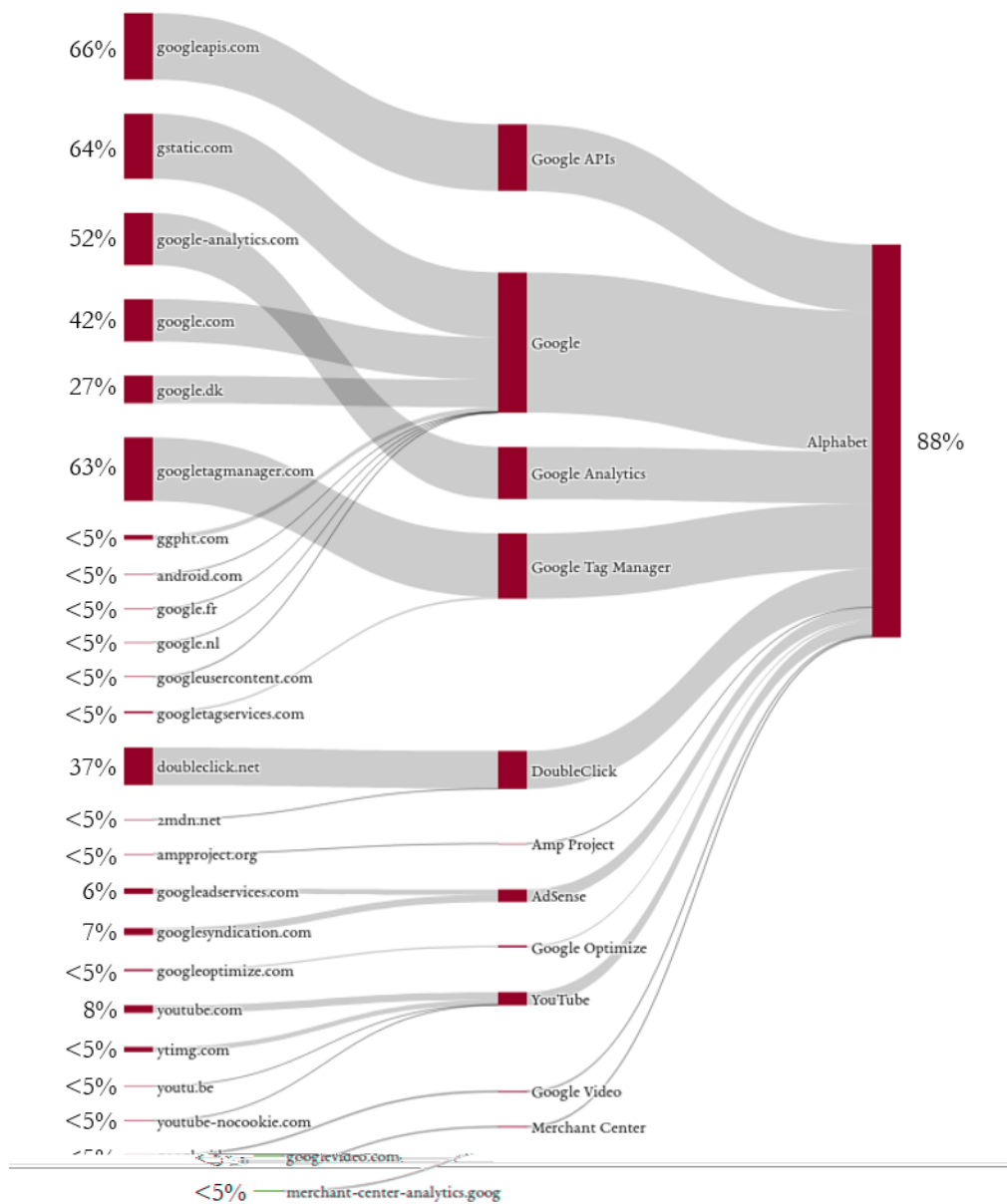
In some cases, the third-party services may have the same owner, and it is important to be aware of this, as it means that data from several different sources may end up with the same company. Figure 4c shows the companies whose third-party services are used on the most .dk websites.

Figure 4c: Top 10 owners of third-party services



The ownership of third-party services can be difficult to understand for website owners and users alike, as the same company can be behind multiple services that have multiple domains associated with them. Figure 4c shows that there are two dominant owners of third-party services, Alphabet and Meta. In total, third-party services from Alphabet are used on 88% of .dk websites, while third-party services from Meta are used on 34% of .dk websites.

Figure 5a: The relationship between third-party domains and third-party services from Alphabet

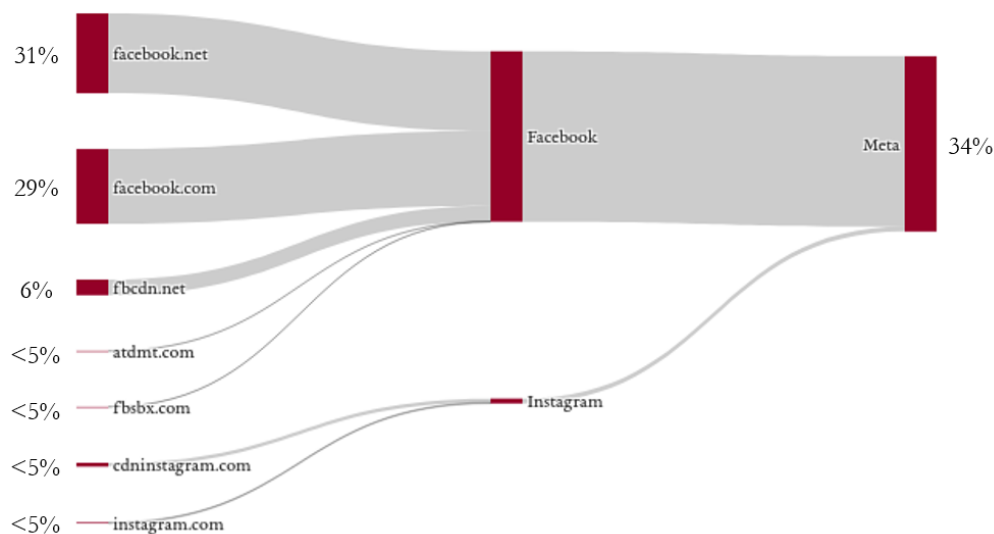


Alphabet is an American company that owns Google and operates services such as Google Analytics, YouTube and DoubleClick. Third-party domains and services belonging to Alphabet are visualized in Figure 5a. The first link shows the three third-party domains, the second link shows the third-party services and the last link shows Alphabet. On the analysed .dk websites, 24 different third-party domains are used, distributed across 11 different third-party services, all owned by Alphabet.

The most used third-party domain from Alphabet, googleapis.com, is used on 66% of websites. At the same time, several third-party domains are used on less than 5% of websites. Alphabet also owns seven out of the ten most popular third-party domains across all the websites analysed (See Figure 4c).

Third-party domains and services belonging to Meta are visualized in figure 5b. Meta is an American company that owns Facebook and Instagram, among others.

Figure 5b: The relationship between third-party domains and third-party services from Meta



Third-party services from around the world

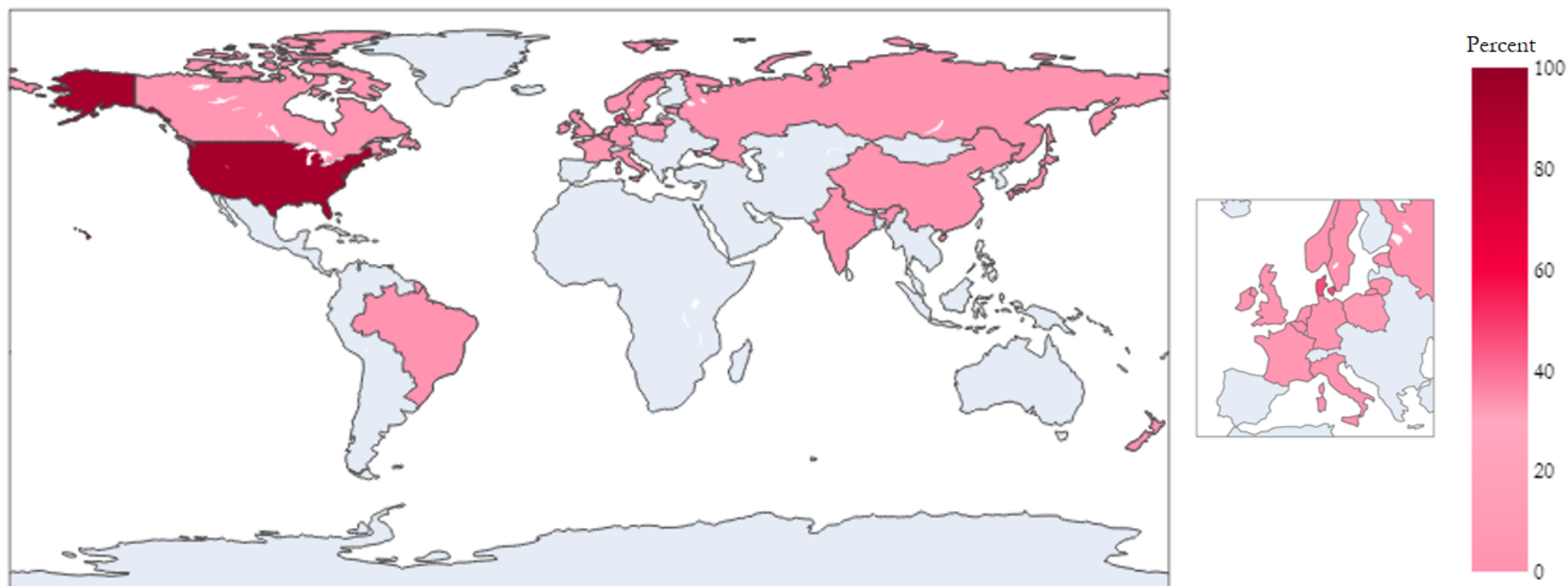
3. Third-party services from around the world

So far, it has been described how a visitor's data can end up with a third party when a person visits a website with embedded third-party services. This tells us something about which companies the data ends up with and thus also where in the world this data ends up. As a website owner, it is worth being aware of this, as there may be different regulations and guidelines for data usage in different countries.

Figure 6 shows the countries from which third-party services appearing on the analysed websites originate. The color of the country indicates the proportion of the analysed websites that use third-party services from that country. The darker the color, the higher the proportion of websites.

As shown in figure 6, 93% of websites use a third party located in the US. However, this is not surprising considering that many of the websites use third-party services from Alphabet and Meta, both of which are headquartered in the US. In addition to the US, 46% of websites use third-party services hosted in Denmark. In addition to Denmark and the US, a smaller proportion of websites use third-party services from Canada, Israel and India.

Figure 6: Geographic location for third-party services used on .dk-websites



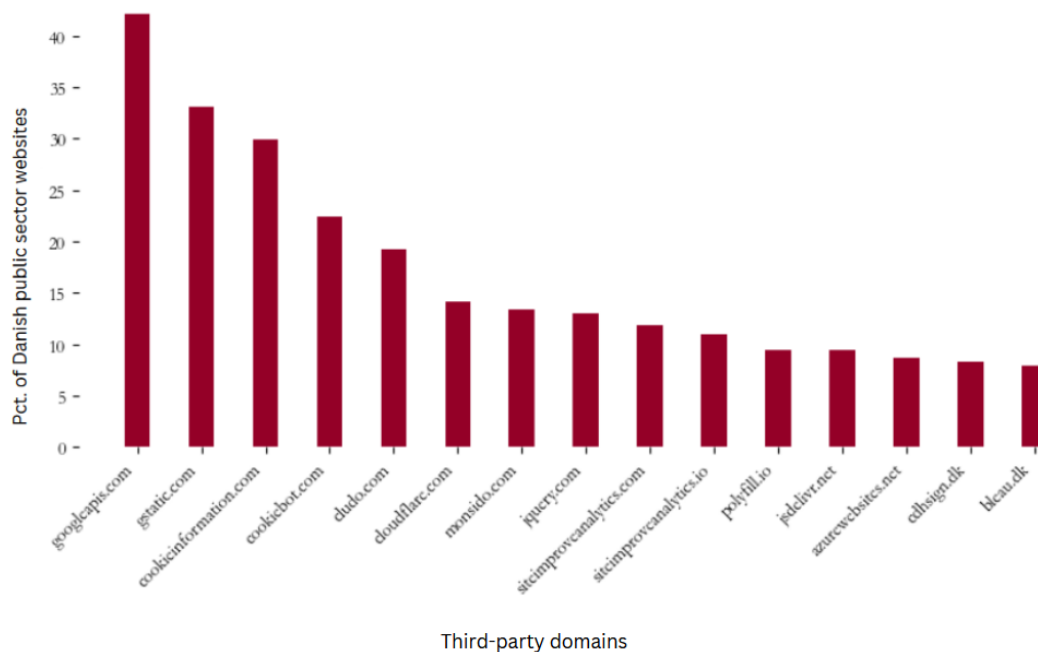
Danish public sector websites

4. Danish public sector websites

In the report, 254 public Danish websites have also been analysed independently. This means that the results from this analysis are not included in the previous analysis of all .dk websites. The analysis covers the respective websites of ministries, including authorities and agencies, municipalities and regions. It is important that citizens, as well as businesses, have confidence in public digital solutions.

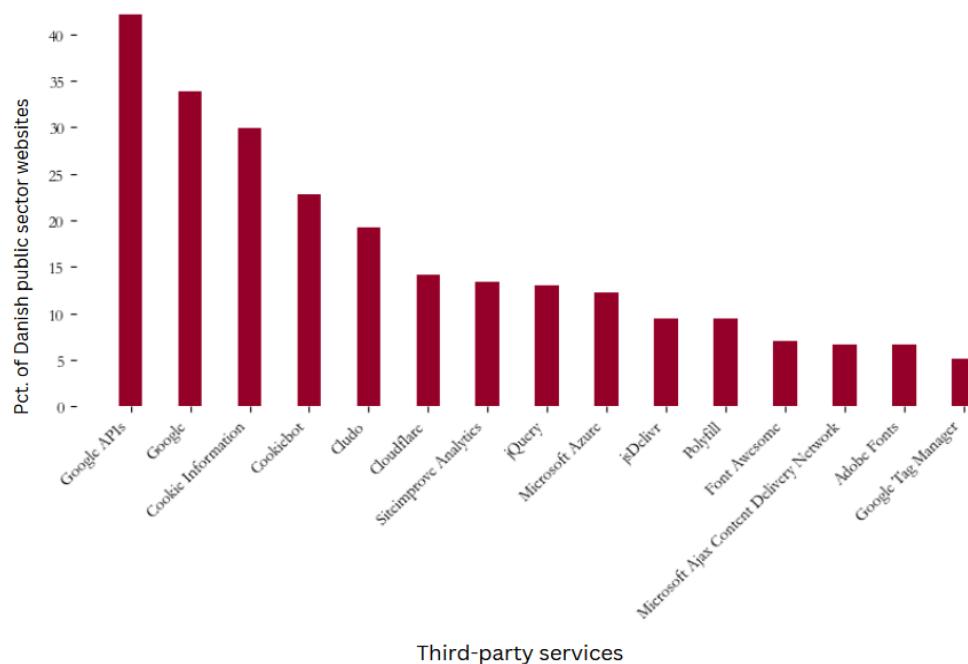
It is therefore important to investigate the extent to which Danish public websites use third-party services because it can potentially lead to data collection. Looking at public Danish websites' use of third-party domains, it is clear that it differs from the .dk websites overall. Figure 7a shows the third-party domains from which most Danish public websites download content, such as images, fonts, plugins, etc.

Figure 7a: Top 15 third-party domains on Danish public sector websites



These third-party domains can be associated with third-party services. Figure 7b shows the third-party services used on the most public Danish websites.

Figure 7b: Top 15 third-party services on Danish public sector websites



These third-party services may in some cases have the same owner. This is important to be aware of, as it means that data ends up with the same company. Figure 7c shows the companies whose third-party services are used the most on the websites of the Danish public sector.

Figure 7c: Top 10 owners of third-party services on Danish public sector websites

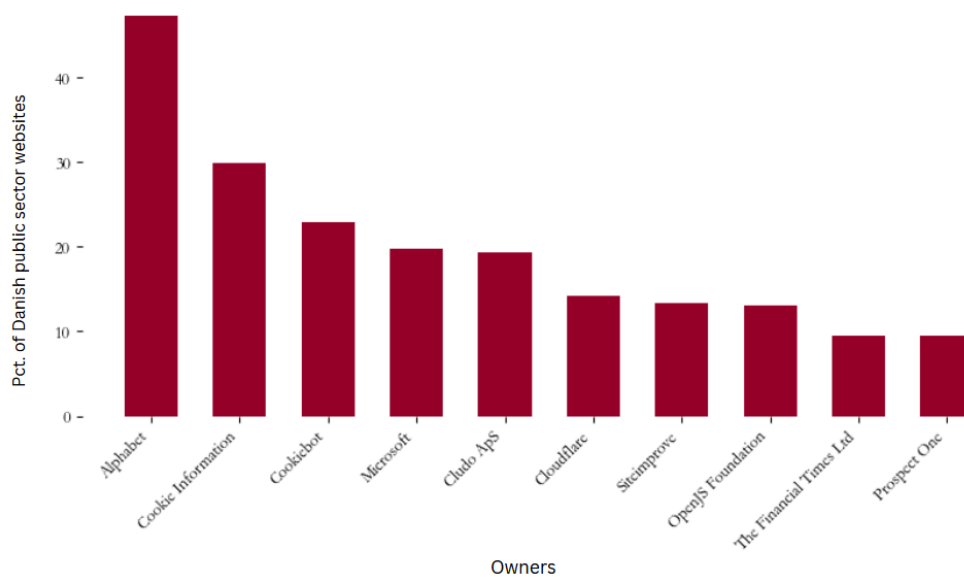
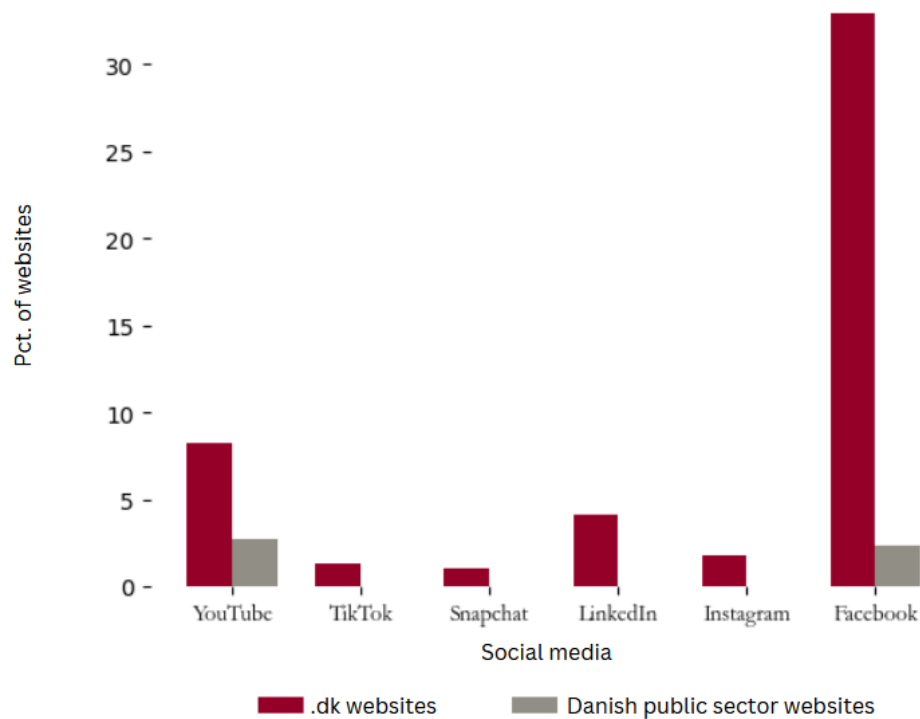


Figure 7c illustrates that Alphabet has the largest presence on Danish public sector websites, just like on the .dk websites. Third-party services from Alphabet are used on 47% of Danish public websites. However, this is significantly less than on .dk websites overall, where third-party services from Alphabet appear on 88% of the websites. The public Danish websites do not have a commercial purpose like the .dk websites, which is why the lower degree of some third-party services should also be expected. Figure 7b also shows that the Danish public sector websites, compared to all .dk websites, in some cases use alternative third-party services. Looking specifically at third-party services used to analyze website traffic, Siteimprove, which is a Danish company, is used on 13% of the public websites as opposed to Google Analytics, which is only used on 2%. This is in contrast to the .dk websites, illustrated in figure 4b, where Google Analytics appears on 52% of the websites and Siteimprove is not among the most used third-party services at all. Siteimprove and Google Analytics both provide analytics tools, but have relatively different penetration rates on Danish public sector websites and .dk websites, respectively.

In addition to the general use of third parties, there is also a difference between public Danish websites and all .dk websites when it comes to the use of social media content, such as plugins or pixels. Of the social media platforms studied; Facebook, Instagram, LinkedIn, Snapchat and TikTok, less than 5% of public Danish websites have shared data with the aforementioned platforms through third-party services. Social media is generally low on both .dk websites and public websites, apart from Facebook. Facebook is found on 33% of all .dk websites examined. However, this is not surprising since third-party content from Facebook is used for targeted marketing, which is probably more relevant for the wide range of .dk websites, such as e-commerce websites and other websites with commercial purposes, than for public Danish websites.

Figure 8: Embedded social media on .dk websites and Danish public sector websites respectively



Overall, the results indicate that Danish public websites have a more limited use of third-party services, which may be a result of a desire to minimize inappropriate data collection. However, it is important to remember that third-party services are also used for purposes that are intended to improve both the website and the visitor's experience of it. It is therefore advantageous to consider both the functionality of the website, the visitor's privacy, etc. when customizing or building a website.

Recommendations for website owners

5. Recommendations for website owners

The analysis has shown that almost all .dk websites use third-party services. It can be difficult for the individual website owner to know who is behind the third-party service that the website owner is using or considering using on their website.

If you as a website owner are unsure about how to get an overview of the third-party services you use on your website, you can use these three recommendations as a starting point. However, it is important to emphasize that even if you follow these recommendations, you as a website owner must still comply with the data protection rules and the rules in the Danish Cookie Law, including requirements such as duty of disclosure and consent.

Recommendation 1: Get an overview of your third-party services

The first thing you can do is to get an overview of which cookies and third-party services you use. You can do this in several ways.

The least technically demanding and easiest way to do this is to check directly in your browser. First, open the website you want to check and then click on the three small dots in the top right corner. Next, select More Tools and then Developer Tools. In most browsers, you can then click Application to see which cookies are set and Sources to see which domains, including third-party domains, content is retrieved from.

It's a good idea to do this both before and after you have given your consent to cookies, so you can get a full overview of your third-party services.

Although a website's front page will often tell you a lot about the third-party services used on the entire website, there may still be third-party content embedded on specific subpages. Therefore, it may be beneficial to repeat the process on some of your subpages. This can be randomly selected subpages, but it can also be subpages where you suspect or know that third-party content is embedded, such as media players and social media feeds.

Recommendation 2: Check if the third-party service is one you actually use and if it requires consent

Once you have a complete overview of your third-party services, it's a good idea to review each third-party service you use. First of all, check whether you recognize the cookie, the third-party domain or the third-party content. You should be aware that third-party services may still be present on a website that was used by a previous website administrator, as responsibility for a website can change over time. When reviewing your third-party services, it is important to assess whether the content in question requires the visitor's consent before it is set or loaded.

Do you have questions about the rules?

If you want to use third-party services on your website, it is important that you comply with the General Data Protection Regulation (GDPR) and the rules in the Danish Cookie Law, which is the Danish implementation of the ePrivacy Directive (ePrivacy).

If you have any questions about the cookie rules, please contact Danish Agency for Digital Government. If you have questions about GDPR or personal data in connection with the use of third-party services, please contact the the Danish Data Protection Agency.

Further guidance on the rules can be found in the Danish Data Protection Agency's guidelines on the processing of personal data about website visitors and the Danish Agency for Digital Government's guidelines on the use of cookies.

Recommendation 3: Actively assess your third-party services

Once cookies and other third-party content have been identified, it's a good idea to consider the underlying company that owns the content. You can do this by reflecting on the questions below.

Questions to reflect on:

1. Is it possible to find out who is behind the service?
2. Is the owner compatible with your values?
3. Where is the company owner based?
4. Can you trust the company owner?
5. Does the company owner have an adequate level of IT security?

Appendices

Appendix A – Scope and data foundation

The analysis examines the prevalence of third-party services on a selected group of Danish websites (.dk websites), which forms the data basis of the analysis. The Danish websites are selected based on their top-level domain ".dk". For example <https://website.dk>.

This also means that Danish websites with another top-level domain, such as .com or .org, are not included in the analysis. The analysis does not examine all .dk websites, but 11,137 of the most visited .dk websites and 254 public websites. The websites are examined using the analysis tool, WebXray, which can be used to see cookies and other website content that is loaded immediately upon visiting the website.

Most visited .dk websites

The most visited .dk websites are those that had the most visitors in the period from June to July in 2022. This is the total number of visits, not unique visits. The same person may have visited a website more than once during the period, in which case each of these visits will be counted.

The websites included in the analysis are retrieved from Semrush. Through Semrush, you can retrieve the 500 most popular websites in 110 different categories. The websites in these general categories have subsequently been filtered to only include .dk websites. This was done to ensure that only Danish websites are included in the analysis. The actual analysis of these websites took place in July 2023 and the results in the report therefore reflect the situation at this time. In total, 11,137 .dk websites have been analysed.

Danish public sector websites

The report also includes a separate analysis of Danish public websites. These have been selected from those included in the Danish Agency for Digital Government's publication, Public Denmark 2019. The publication contains the websites of the Danish Realm's ministries, including authorities and agencies, municipalities, and the parties in the Danish Parliament, the Faroese Løgting and the Greenlandic Parliament. Only websites belonging to ministries, including authorities and agencies, and municipalities in Denmark are included. The websites of the five Danish regions are also included and therefore a total of 254 Danish public sector websites have been analysed.

Appendix B – Third-party services location

Geographical location of third-party services used on .dk websites.

Ranking	Country	Number of websites	Percent
1	USA	10343	93
2	Denmark	5172	46
3	Poland	992	9
4	France	605	5
5	Canada	393	4
6	UK	300	3
7	Germany	156	1
8	China	149	1
9	New Zealand	129	1
10	Estonia	128	1
11	Lithuania	106	1
12	India	47	<1
13	Belgium	38	<1
14	Netherlands	37	<1
15	Sweden	29	<1
16	Norway	28	<1
17	Ireland	19	<1
18	Italy	8	<1

Ranking	Country	Number of websites	Percent
19	Singapore	6	<1
20	Russia	3	<1
21	Japan	1	<1
22	Brazil	1	<1

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