Datalayer for Analytics Implementation

Contents

Introduction to Data Layers

A "data layer" is a framework of JavaScript objects your developers would put on your pages that can be used by tracking tools (including tag management systems like DTM) to populate reports.

Implementing a data layer on your site will give you the ultimate control and flexibility over your implementation, and allow for the easiest maintenance going forward. The names of these JavaScript objects are theoretically arbitrary, but the best practice is to use something consistent and predictable. Your developers may already have a data layer, or a preference for the format. There are a few different standards the tracking community has created as a starting point- this technical specifications document will use the W3C standard "digitalData" object that was created by a group of experts from major internet tracking companies and will be accepted by the widest variety of tracking technology (in case you ever need to use the data layer for more than this DTM implementation).

For more information on the Data Layers, please see the appendix.

Beginning with examples

The specification relies on a JavaScript Object (JSO) to collect customer experience data. User interaction with a brand's digital property occurs in a wide variety of areas: customer service, e- commerce transactions, information portals, B2B partner interaction, and more, and the JSO is designed to accommodate these (as well as being extensible). Further sections of this document will delve into detailed specifications for the JSO, but following are simple examples of an instance of the JSO to illustrate its usage.

The JSO is designed to be contained within a root object called `digitalData` — this is a matter of convenience and gives a common starting point. All other objects are sub-object from this root object. There is a `pageInstanceID` that is used to identify the page being measured within a unique environment — development, staging, or production, for example. Beyond that, the specification includes sub-objects such as `page`, `product`, `cart`, `transaction`, `event`, `component`, `user`, `privacyAccessCategories`, and `version` for collecting different types of data in the JSO. (Additional objects can be added to `digitalData` as part of the extension mechanism.) Within the sub-objects, the specification defines a number of standard names for properties, while custom properties can also be added through an `attributes` object.

As an illustrative example, the `digitalData` object with the `page` object could be populated as below

```
digitalData = {
       pageInstanceID: "MyHomePage-Production", page:{
           pageInfo: {
             pageID: "Home Page",
           destinationURL: "http://mysite.com/index.html"}, category:{
                  primaryCategory: "FAQ Pages",
                  subCategory1: "ProductInfo",
                  pageType: "FAQ"},
             attributes:{
                  country: "US", language:
                  "en-US"}
       }
  };
```

The specification allows the use of sub-objects and their properties as needed in any particular implementation. **While the presence of the sub-objects is optional, sub-objects that are populated must adhere to the syntax and semantics defined in this document to be conformant with the specification.**

Another instance of populating `digitalData` with both `page` and `product` objects is shown below:

```
digitalData = {

     pageInstanceID: "ProductDetailPageNikonCamera-Staging",
     page:{
          pageInfo:{
               pageID: "Nikon Camera",
               destinationURL:
                  "http://mysite.com/products/NikonCamera.html"},
          category:{
               primaryCategory: "Cameras",
               subCategory1: "Nikon", pageType:
               "ProductDetail"},
          attributes:{
               Seasonal: "Christmas"}
          },
     product:[{
          productInfo:{
               productName: "Nikon SLR Camera", sku:
               "sku12345",
               manufacturer: "Nikon"},
          category:{
               primaryCategory: "Cameras"},
          attributes:{
               productType: "Special Offer"}
     }]
};
```

The `product` sub-object is an array with additional details to identify the product further.

As is evident from these examples, different pages that incorporate different types of data may populate different parts of the JSO to pass those data back to the server(s) for furtheranalysis.

Privacy and Data Security Implications

Site visitor interactions with a website are collected as data, and could potentially include personally identifiable information or sensitive information about site visitors. The owner of a website is responsible for the legal consequences of the data collected, published in the site, and shared with technology vendors. This regulation differs from jurisdiction to jurisdiction and commonly takes the form of two classes of legislation:

- Site visitor privacy regulation (e.g., the EU Cookie Directive)
- Data security protection regulations (e.g., HIPAA)

Site visitor **privacy** regulations restrict site practices around whether or not to track a visitor's behavior. Data **security** protection regulations legislate whether a site owner can store and share visitor data, as well as how and for what duration you can retain that data (for more details on regulations, see Appendix B).

As the Customer Experience Digital Data initiative represents centralizing data collection, the JSO was designed with vendor-neutral objects that site owners can use to control which third- party technologies to enable on a site, and which data can be shared with the enabled technologies.

Leveraging the specification for privacy and security requires building the `privacy` object as well as the `security` objects for those components of data objects that are meant to be protected. Actual enforcement depends on processing that is external to the JSO. (See 6.10 and 6.11 for the specification of the `privacy` and `security` objects, and see Appendix B for recommendations to solution providers).

Privacy Object Categorizes Vendors

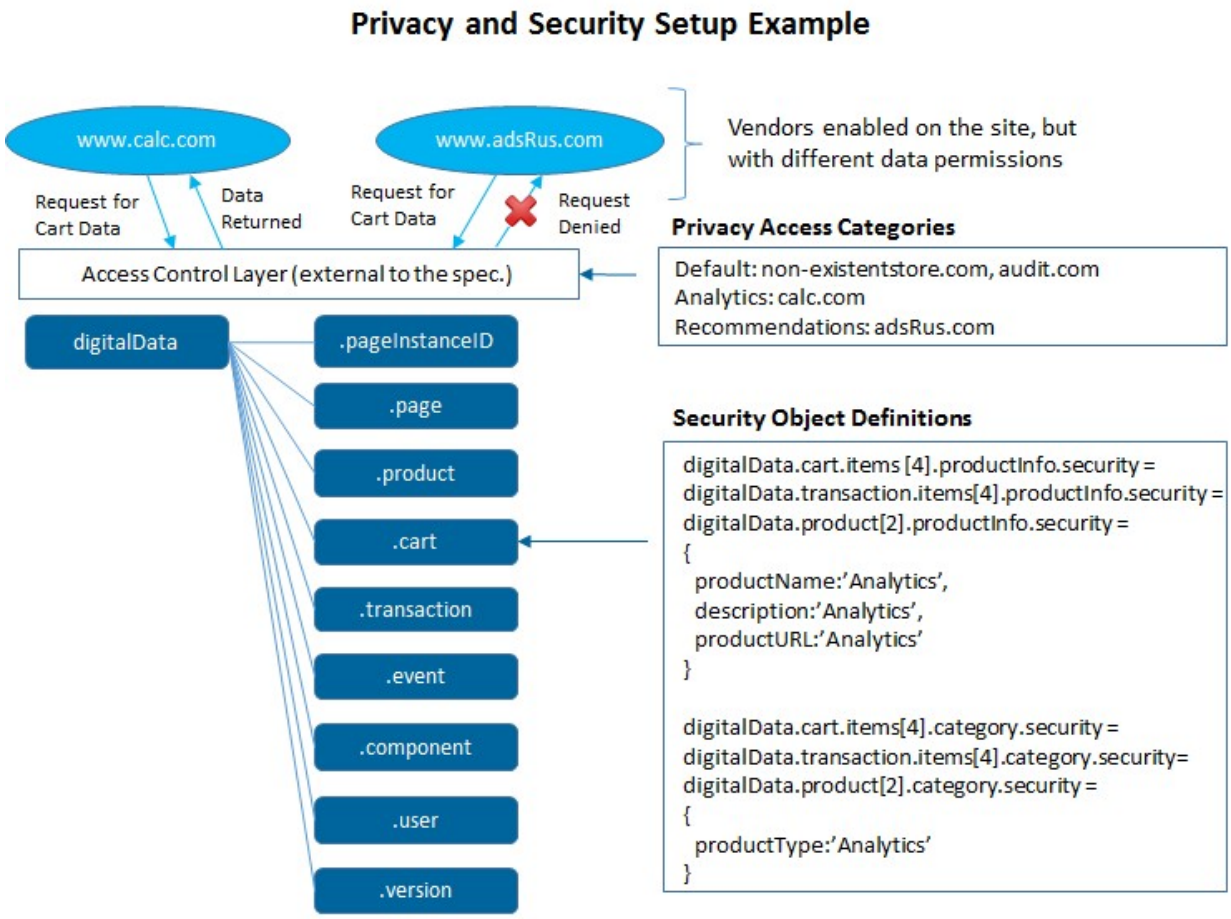
The JSO allows for the creation of a `privacy` object that is meant to categorize the various vendors with whom data may be shared into a small but meaningful set. The `privacy` object can be used to create vendor categories relevant for the website. For example, a site may create vendor categories such as "Analytics", "Personalization", and so forth. Categorizing the vendors in this fashion makes it easier to indicate what type of data sharing is appropriate with each.

Data Security property Categorizes Data

The JSO also allows for the creation of an optional `security` sub-object that is attached to any object in the specification. This `security` object identifies the categories of vendors (defined in the `privacy` object) with which that particular data property can be shared. For example, `productInfo.security = "Analytics"` implies that the `productInfo` property can be only shared with vendors categorized as "Analytics" vendors and vendors placed in the "Default" category in the `privacy` object

Implementation Example

Consider the following example, of an e-commerce company, www.nonexistent-store.com, which uses tools from the vendor's calc.com, adsRus.com, and audit.com, and uses the `digitalData` object below:



Because www.nonexistent-store.com operates primarily in the Netherlands, they have a requirement for privacy, and because they sell medication there are also concerns around the sensitivity of the data they collect and store.

To use the data standard, first they will categorize their technology vendors into categories:

- Default: nonexistent-store.com, audit.com
- Analytics: calc.com
- Recommendations: adsRus.com

To implement those categories, they will code the

`digitalData.privacy.accessCategories` sub-object

The Customer Experience Digital Data Object

This section carries the core specification.Use of this specification can be adapted to specific cases, since the objects in the specification can be included or omitted as necessary or desired. None of the objects in this specification are required, but where objects are included they MUST conform to the Object Names and Types listed here.

The Root JavaScript Object

The root JavaScript Object (JSO) MUST be `digitalData`, and all data properties within this specification MUST fall within the hierarchy of the `digitalData` object.

The following sub-objects are defined as children of the `digitalData` object.

- `digitalData.pageInstanceID`
- `digitalData.page`
- `digitalData.product[n]`
- `digitalData.cart`
- `digitalData.transaction`
- `digitalData.event[n]`
- `digitalData.component[n]`
- `digitalData.user[n]`
- `digitalData.privacyAccessCategories`
- `digitalData.version`

The following subsections detail each of these sub-objects.

Site Content Effectiveness

This solution allows the business unit to evaluate the effectiveness of the site's pages, including their influence on conversion, landing page bounce rate and exit rate as well as gives the marketers the ability to drill down on each level of your site hierarchy. To do that requires that every page of the site be tagged with an effective page name and variables to represent each level of the content hierarchy.

An example of how the dataLayer for this solution must be set is as below

This object describes the page information

```
digitalData.page={
      pageInfo:{
            pageName:"Electronics:TVandVideo:Dell:Inspiron",
      },
      category:{
            pageType:"pdp",
            primaryCategory: "electronics",
            subCategory1:"TVandVideo",
            subCategory2:"Dell"
      }
}
```

Tool Usage

This solution allows you to track the types of tools users use as well as the impact it has on any downstream activities and conversion.

Example data object for calculator page:

```
digitalData.tool={
      toolName:"Calculator:Housing Loan"
}
```

Internal Site Search

This solution is intended to track internal search terms, that is, searches being performed by users on your site to help business understand top search keywords, conversion rate for top keywords, as well as keywords that not returning any results to help you further optimize your internal search engine.

This object describes the search term and search results

```
digitalData.page={
      pageInfo:{
            onsiteSearchTerm:"electronics",
            onsiteSearchResults: “1204”
      }
}
```

Site Registration Tracking

This solution allows users to understand how often users are initiating the registration process vs. completing it. This will allow them to identify pages where the application is being abandoned and optimize them to increase the completion rate.

Example data object for all registration pages:

```
digitalData.registration={
      formName:"Create Account:Account Management",
      formType:”Sign-up”
}
```

Visitor Segmentation

This solution allows you to track unique user id used for your customers and gives business the ability to segment the users to understand the behavior better and target audiences accordingly.

Example data object for login landing page:

```
digitalData.user={
      profile:{
            profileInfo:{
                  profileID:"abc123"
            }
      }
}
```

Content MetaData

This solution allows the business to understand at a granular (content attributes) level how the users are consuming content to help increase effectiveness and the impact on downstream activities.

Example data object for an article page:

```
digitalData.page={
      content:{
             author="James",
             tags="digital world,technology,revolution",
             articleID="rad123"
      }
}
```

Content Monetization

This section allows the business to understand the value of ads being presented on a given site. It allows them to analyze impressions vs. clicks for the ads to further understand the revenue the ads are generating.

Example data object for an article page:

```
digitalData.adinfo={
      ad: [
               //begin ad #1

               {
                    adid:"123abc",
                  advalue:"100"
               }
            //end ad #1
          ]
}
```

Shopping Cart and Purchases

This solution focuses on understanding how conducive your checkout process is to a full and complete checkout. It will help answer how many users get to a certain point and then continue or exit the process altogether. The tagging of the shopping cart is among the most important tagging done on the site.

Pass the id of the product(s) in the cart into the digitalData.cart.item array.

```
digitalData.cart = {
      item:[
//start product 1
            {
            productInfo:{
                  productID: "100087613", //SKU
                  }
            },
//end product 1, repeat for each subsequent product
}
```

Example data object for order confirmation page for 1 product:

```
digitalData.transaction = {
      purchaseID: "W306702397",
      paymentMethod: "visa",
      //TRANSACTION ITEMS
      item:[
            //begin product #1
            {
                  quantity:"1",
                  price: {
                        basePrice: "5.94"
                  },
                  productInfo:{
                        productID: "100087613" //SKU
                  }
            },
            //end product #1, repeat for each subsequent product
      ]
}
```

Example data object for order confirmation page for 3 products:

```
digitalData.transaction = {
      purchaseID: "W306702397",
      paymentMethod: "visa",
      //LIST ITEMS IN CART:
      item:[
            //begin product #1
            {
                  quantity:"1",
                  price: {
                        basePrice: "5.94"
                  },
                  productInfo:{
                        productID: "100087613" //SKU
                  }
            },
            //end product #1, start product 2:
            {
                  quantity:"1",
                  price: {
                        basePrice: "20.52"
                  },
                  productInfo:{
                        productID: "53215652" //SKU
                  }
            },
            //end product 2, start product 3
            {
                  quantity:"1",
                  price: {
                        basePrice: "8.50"
                  },
                  productInfo:{
```

```
                        productID: "205432881" //SKU
                    }
                },
                //end product 3
        ]
}
```

Video Tracking

This solution allows you to track which videos on the site were most viewed and which lead to a downside conversion.

Example of dataLayer when a video is loaded

```
digitalData.page={
video{
      videoname:"Video Name"
}}
```

Lead Funnels

This solution allows users to understand how often users are initiating different leads and application forms vs. completing it to better understand conversion rate as well as identify the popularity of specific flow types. The solution will also help business identify pages where the application is being abandoned and optimize them to increase the completion rate.

Example data object for lead gen initiation page:

```
digitalData.lead={
      appName:"Quote:Roof Quote"
}
```

Example data object for lead gen completion page:

```
digitalData.lead={
      appName:transactionID:"123XVB"
}
```

Self Service Transactions

This solution allows users to understand how often users are initiating the self-service tools. This will allow them to identify pages where the self-service tool is being abandoned and optimize them to increase the completion rate.

Value example for service initiation page:

```
digitalData.selfservice={
      selfserveName:"Customer Support: Contact Us"
}
```

Travel Search

This solution allows you to track and understand the travel search attributes that users are searching for to help optimize the search engine, search results and conversion.

Example data object for travel search results landing page:

```
digitalData.travelSearch={
            destination:"Spain",
            checkInDate:"05/10/2015",
            checkOutDate:"05/12/2015",
            numberOfRooms:"1",
            numberOfAdults:"2",
            numberOfChildren:"0"
              stayDuration:"2",
              travelBookingPace:"2"
}
```

Bibliography

- http://www.w3.org/2013/12/ceddl-201312.pdf