

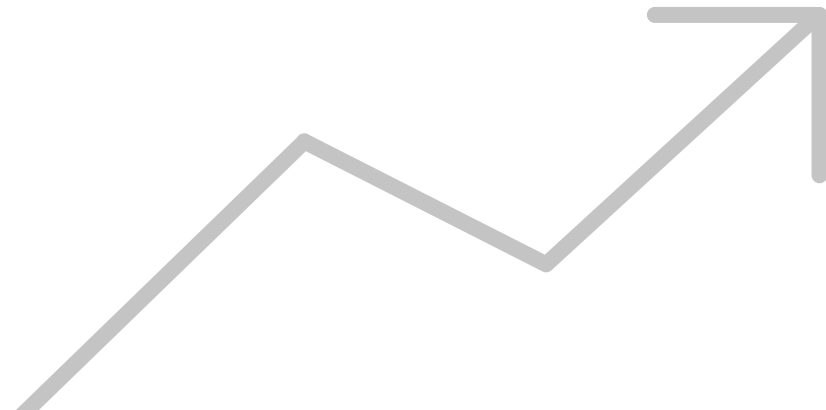
# *Modern graphics to present survey results on satisfaction with public administration*

9th International Conference – The Use of R in Official Statistics –

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Federal Statistical Office of Germany

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Modern graphics: satisfaction with public administration

# Background

- Life-events surveys of citizens and companies on satisfaction with public administration
- Part of Federal Government's programme on Better Regulation
- First conducted: 2015
- Results depicted: 2019
- [www.amtlich-einfach.de](http://www.amtlich-einfach.de)

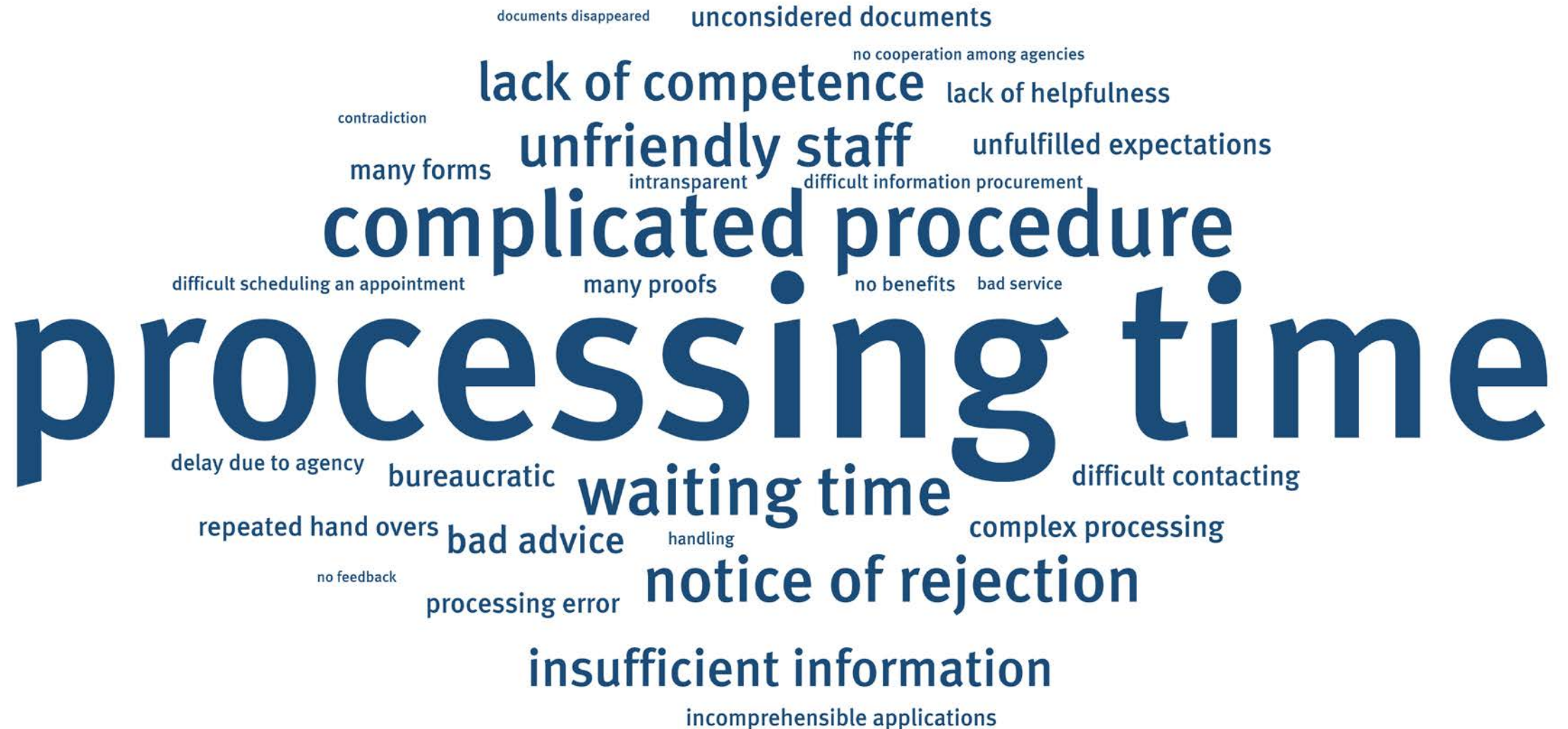
**ZUFRIEDENHEIT DER BÜRGERINNEN UND BÜRGER  
MIT BEHÖRDLICHEN DIENSTLEISTUNGEN**  
Ausgewählte Ergebnisse der Lebenslagenbefragung 2019



wissen.nutzen.

amtlich  
Staat der  
kurzen Wege **EINFACH!**

## Word cloud



# Generating and exporting the word cloud

**library(wordcloud2)**

```
wolke <- wordcloud2( intro_b,  
                    color = farbe_b,  
                    backgroundColor = "white",  
                    rotateRatio = 0  
                    fontFamily = "MetaNormalLF-Roman",  
                    size = 5, gridSize = 100,  
                    widgetsize = c(9600, 5385))
```

Data frame containing words and their frequency  
(2 columns)

Vector containing the different shades of blue

Rotation of the cloud in radians

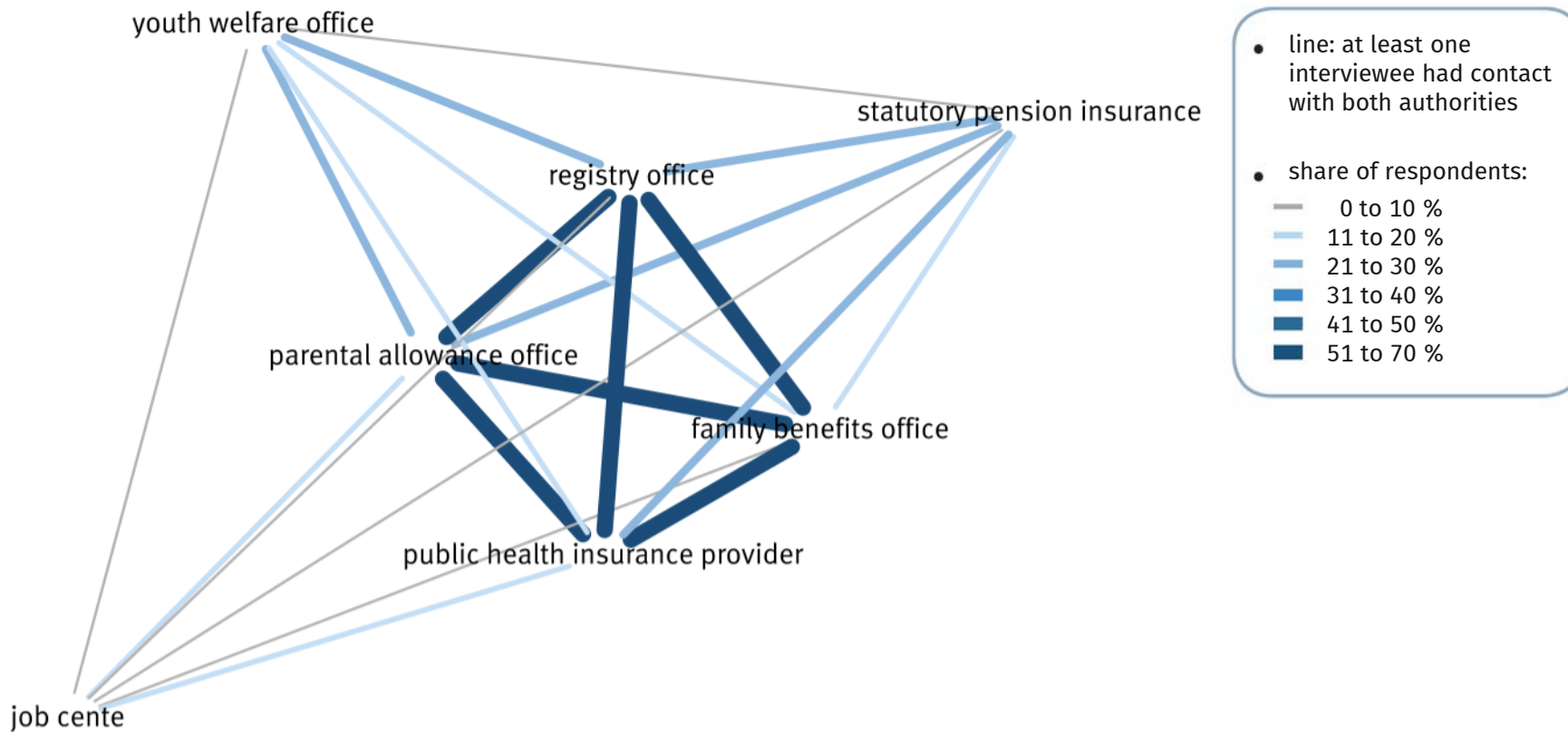
**library(webshot)**

**library(htmlwidgets)**

```
saveWidget(wolke, "wolke_intro_b.html", selfcontained = F)
```

# Network diagram

## Frequency of combination of contacts with authorities – birth of a child



# input data

	layer	authority1	authority2	share
1	birth of a child	parental allowance office	family benefits office	60
2	birth of a child	parental allowance office	youth welfare office	22
3	birth of a child	parental allowance office	job cente	11
4	birth of a child	parental allowance office	public health insurance provider	62
5	birth of a child	parental allowance office	statutory pension insurance	21
6	birth of a child	parental allowance office	registry office	63
7	birth of a child	family benefits office	youth welfare office	19
8	birth of a child	family benefits office	job cente	9
9	birth of a child	family benefits office	public health insurance provider	55
10	birth of a child	family benefits office	statutory pension insurance	19
11	birth of a child	family benefits office	registry office	53
12	birth of a child	youth welfare office	job cente	6
13	birth of a child	youth welfare office	public health insurance provider	19
14	birth of a child	youth welfare office	statutory pension insurance	8
15	birth of a child	youth welfare office	registry office	21
16	birth of a child	job cente	public health insurance provider	12
17	birth of a child	job cente	statutory pension insurance	3
18	birth of a child	job cente	registry office	10
19	birth of a child	public health insurance provider	statutory pension insurance	22
20	birth of a child	public health insurance provider	registry office	55
21	birth of a child	statutory pension insurance	registry office	22

# programming code

## library(igraph)

```
pdf(file="~/network_birth.pdf"), pointsize=8, height = 3.07087, width= 5.59055 );

par(family="mtnolfro",mar = c(0, 5, 0, 5)) ;

netzwerk_mat <- as.matrix(data);

g=graph.edgelist(netzwerk_mat [,1:2],directed=FALSE);

E(g)$weight=as.numeric(netzwerk_mat [,3]);

E(g)[weight <= 10 & weight > 0]$edge.color <- "#b3b3b3";

E(g)[weight <= 10 & weight > 0]$edge.width <- 1;

...
```

creates a new pdf for the graph

par can be used to set or query graphical parameters

a numerical vector of the form c(bottom, left, top, right) which gives the margin size specified in inches

variables containing the names of each two nodes to be connected

undirected is for lines and directed for arrows

variable containing the frequency of each combination

Different thicknesses and colors of the connection lines are assigned here based on the frequency values of the combinations.

# programming code

...

```
plot(g, vertex.shape="none",  
      vertex.frame.color="#ffffff",  
      vertex.label.color="black",  
      edge.width=E(g)$edge.width,  
      edge.color = E(g)$edge.color,  
      vertex.label.family="mtnolfro",  
      asp = 0  
);
```

Attributes of the nodes („edges“) and connection lines („vertexes“) can be specified by the parameters of the plot function.

There are even more options than showed here.  
E.g., via `vertex.size` the size of the nodes can be variated.

numeric constant for the aspect ratio; 0 is for side / width = 1 / 1.

```
dev.off();
```

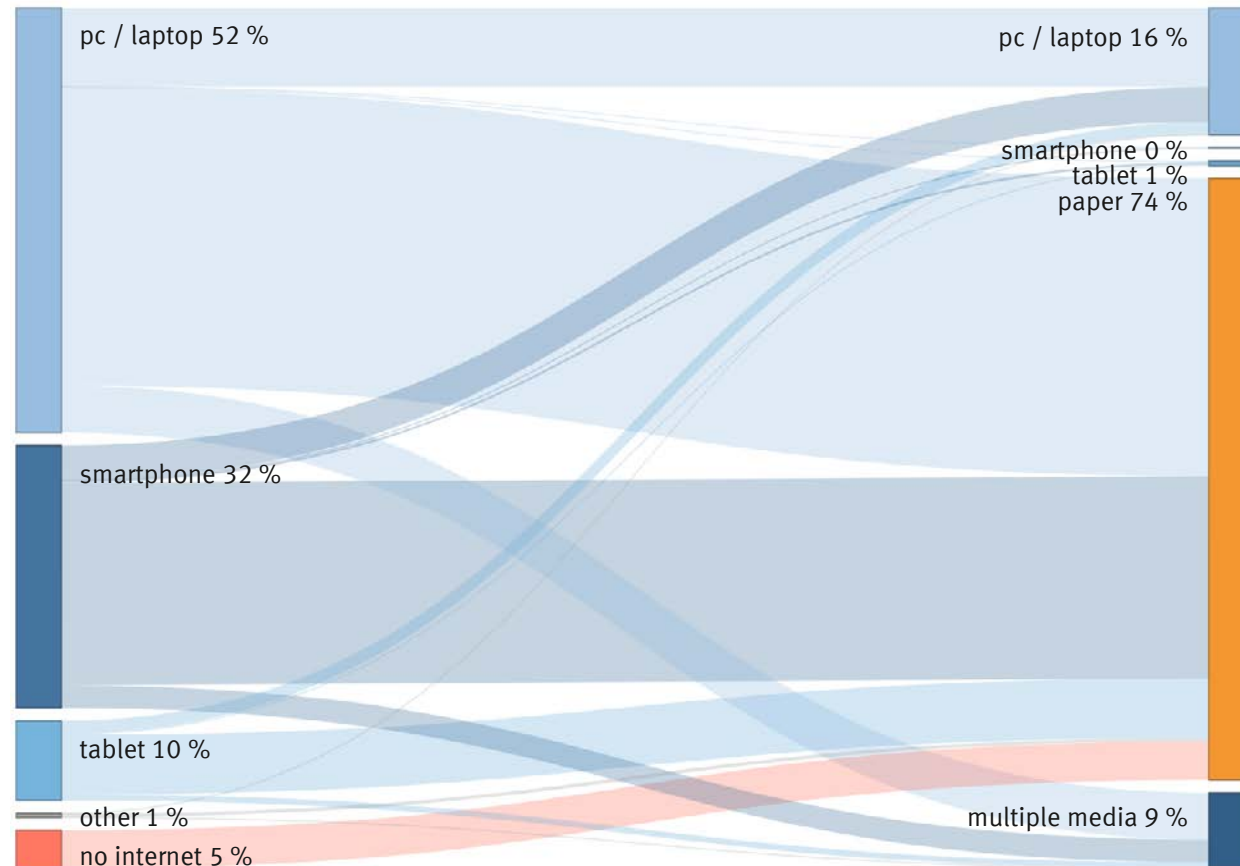
Closes the pdf

Further information: <https://igraph.org/r/doc/plot.common.html> (official documentation)  
<https://yunranchen.github.io/intro-net-r/igraph.html> (many examples)



# Sankey diagram

Use of media for private communication (values on the left) and for communication with authorities (values on the right)



# input data

**Nodes:** contains the names of the nodes and the corresponding group for the color

	name	group	=
1	pc / laptop	pc	0
2	smartphone	smartphone	1
3	tablet	tablet	2
4	other	other	3
5	no internet	no	4
6	pc / laptop	pc	5
7	smartphone	smartphone	6
8	tablet	tablet	7
9	paper	paper	8
10	multiple media	multiple media	9

**Links:** contains the source number, the target number and the frequency value for the connection lines, as well as the group for the color

	source	target	value	group
1	0	9	5.79	pc1
2	0	5	9.77	pc1
3	0	8	36.76	pc1
4	0	6	0.02	pc1
5	0	7	0.12	pc1
6	1	9	2.80	smartphone1
7	1	5	4.31	smartphone1
8	1	8	25.02	smartphone1
9	1	6	0.05	smartphone1
10	1	7	0.27	smartphone1
11	2	9	0.75	tablet1
12	2	5	1.55	tablet1
13	2	8	7.37	tablet1
14	2	7	0.17	tablet1
15	3	9	0.04	other1
16	3	5	0.05	other1
17	3	8	0.42	other1
18	4	8	4.75	no1

# programming code

```
my_color <- 'd3.scaleOrdinal() .domain(["pc",  
  "smartphone",  
  "tablet",  
  "other",  
  "paper",  
  "no",  
  "multiple media",  
  "pc1",  
  "smartphone1",  
  "tablet1",  
  "other1",  
  "paper1",  
  "no1",  
  "multiple media1"  
])  
.range(["rgba(140,182,221,1)",  
  "rgba(48,100,149,1)",  
  "rgba(102,170,215,1)",  
  "rgba(153,153,153,1)",  
  "rgba(242,138,24,1)",  
  "rgba(255,103,80,1)",  
  "rgba(27,76,121,1)",  
  "rgba(140,182,221,0.4)",  
  "rgba(48,100,149,0.4)",  
  "rgba(102,170,215,0.4)",  
  "rgba(153,153,153,0.4)",  
  "rgba(242,138,24,0.4)",  
  "rgba(255,103,80,0.4)",  
  "rgba(27,76,121,0.4)"  
])'
```

group names in the node-dataset

group names in the link-dataset

assigns colors to the node groups above

assigns colors to the link groups above

# programming code

## library(networkD3)

```
sankeyNetwork(
  Links = links,
  Nodes = nodes,
  Source = "source",
  Target = "target",
  Value = "value",
  NodeID = "name",
  fontSize= 32,
  fontFamily= "MetaNormalLF-Roman",
  nodeWidth = 50,
  iterations = 0,
  colourScale = my_color,
  LinkGroup="group",
  NodeGroup="group")
```

The two datasets with the needed information on nodes and links and the relevant columns inside them have to be specified here.

The order in which the nodes are displayed can be changed here

Further information: <https://www.rdocumentation.org/packages/networkD3/versions/0.4/topics/sankeyNetwork> (official documentation)  
<https://christophergandrud.github.io/networkD3> (other examples)

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