

Yoshi

December 21, 2020

```
[196]: #install.packages("bupaR")
#install.packages("edeaR")
#install.packages("eventdataR")
#install.packages("processmapR")
#install.packages("processmonitR")
#install.packages("xesreadR")
#install.packages("petrinetR")
#install.packages("DiagrammeRsug")
```

```
[8]: library(bupaR)
library (edeaR)
library(lubridate)
library(repr)
```

Attaching package: ‘bupaR’

The following object is masked from ‘package:stats’:

filter

The following object is masked from ‘package:utils’:

timestamp

Attaching package: ‘lubridate’

The following objects are masked from ‘package:base’:

date, intersect, setdiff, union

```
[9]: load(file = "data.RData")  
  
Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA CIVIL ACÚSTICA' cannot be translated to UTF-8, is it  
valid in 'CP1252'?"  
Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA CIVIL ELECTRÓNICA' cannot be translated to UTF-8, is  
it valid in 'CP1252'?"  
Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA CIVIL EN INFORMÁTICA' cannot be translated to UTF-8,  
is it valid in 'CP1252'?"  
Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA CIVIL EN OBRAS CIVILES' cannot be translated to UTF-8,  
is it valid in 'CP1252'?"  
Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA CIVIL MECÁNICA' cannot be translated to UTF-8, is it  
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Warning message in load(file = "data.RData"):  
"input string 'INGENIERÍA EN CONSTRUCCIÓN' cannot be translated to UTF-8, is it  
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"input string 'INGENIERÍA NAVAL' cannot be translated to UTF-8, is it valid in  
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```

```
[10]: a<-load("data.RData")#, "dat" )  
head(a)
```

```

order_to_cash %>%
  process_map()

order_to_cash %>%
  filter_activity_presence("Cancel Quotation", method = "none") %>%
  filter_trim (end_activities = "Receive Sales Order") %>%
  process_map(
    type_nodes = frequency (),
    type_edges = performance (units = "hours")
  )

pre_sales %>%
  process_map()

```

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'CP1252'?"

1. 'MyEventLog' 2. 'f1a1' 3. 'phone_repair' 4. 'f1a2' 5. 'MyData' 6. 'f3a1'

HTML widgets cannot be represented in plain text (need html)

Warning message:
``tbl_df()`` is deprecated as of dplyr 1.0.0.
Please use `tibble::as_tibble()` instead.
This warning is displayed once every 8 hours.
Call `lifecycle::last_warnings()` to see where this warning was
generated.

HTML widgets cannot be represented in plain text (need html)

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```

[90]: `summary(cases(order_to_cash))`

case_id	trace_length	number_of_activities
Length:3651	Min. : 3.00	Min. : 3.00
Class :character	1st Qu.:13.00	1st Qu.:13.00
Mode :character	Median :16.00	Median :16.00
	Mean :15.94	Mean :15.94
	3rd Qu.:21.00	3rd Qu.:21.00
	Max. :30.00	Max. :30.00
start_timestamp	complete_timestamp	trace
Min. :2017-01-01 12:13:56	Min. :2017-01-10 12:20:33	Length:3651
1st Qu.:2017-04-05 13:48:43	1st Qu.:2017-06-06 14:57:14	Class :character
Median :2017-07-05 18:41:08	Median :2017-09-04 13:06:34	Mode :character
Mean :2017-07-06 18:17:28	Mean :2017-09-05 03:06:51	
3rd Qu.:2017-10-08 11:02:29	3rd Qu.:2017-12-07 18:42:07	
Max. :2017-12-31 19:54:11	Max. :2018-04-22 19:56:13	
trace_id	duration_in_days	first_activity
Min. : 1.0	Min. : 2.788	Receive Request For Quotation:1833
1st Qu.: 590.5	1st Qu.: 46.098	Receive Sales Order :1818
Median : 963.0	Median : 62.950	
Mean : 953.6	Mean : 60.368	
3rd Qu.:1387.5	3rd Qu.: 78.082	

```

Max.    :1656.0   Max.    :139.117
                           last_activity
Cancel Quotation          : 255
Create Credit Note         : 204
Decline Request For Quotation: 372
Payment Received           :2564
Send Invoice               : 175
Submit To Credit Collection :  81

```

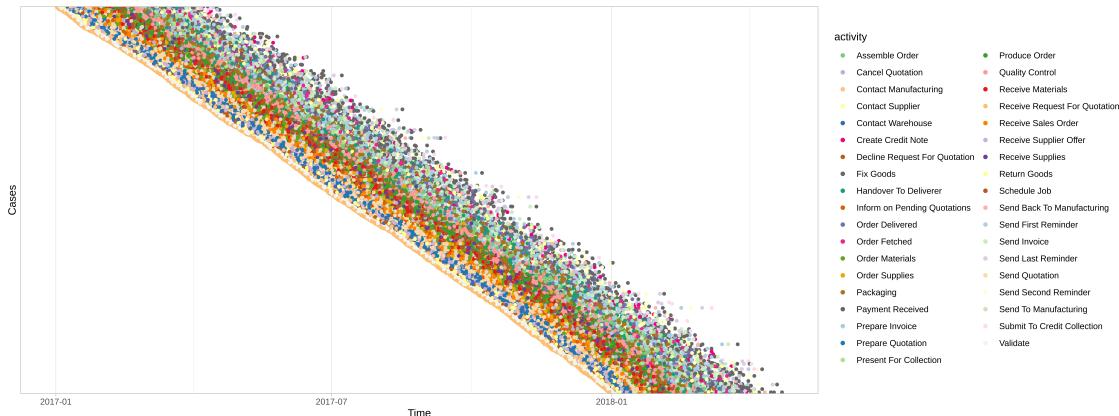
[10]: `resources(order_to_cash)`

resource <fct>	absolute_frequency <int>	relative_frequency <dbl>
George	5711	0.09815076
Andrea	5407	0.09292613
Jonathan	4777	0.08209879
Virginia	4686	0.08053484
Amy	3636	0.06248926
Katherine	3586	0.06162995
Cheryl	3519	0.06047847
Julia	3194	0.05489293
Phillip	3047	0.05236655
Gregory	3024	0.05197126
Louis	2567	0.04411714
Mary	2283	0.03923624
Steven	2266	0.03894408
Matthew	2083	0.03579899
Kimberly	1995	0.03428660
Jerry	1601	0.02751521
Tina	1520	0.02612312
Sara	1308	0.02247963
Diana	1022	0.01756436
Stephen	954	0.01639570

A tibble: 20 × 3

[12]: `options(repr.plot.width=16, repr.plot.height=6, repr.plot.res=1000)`
`order_to_cash %>%`
`dotted_chart()`

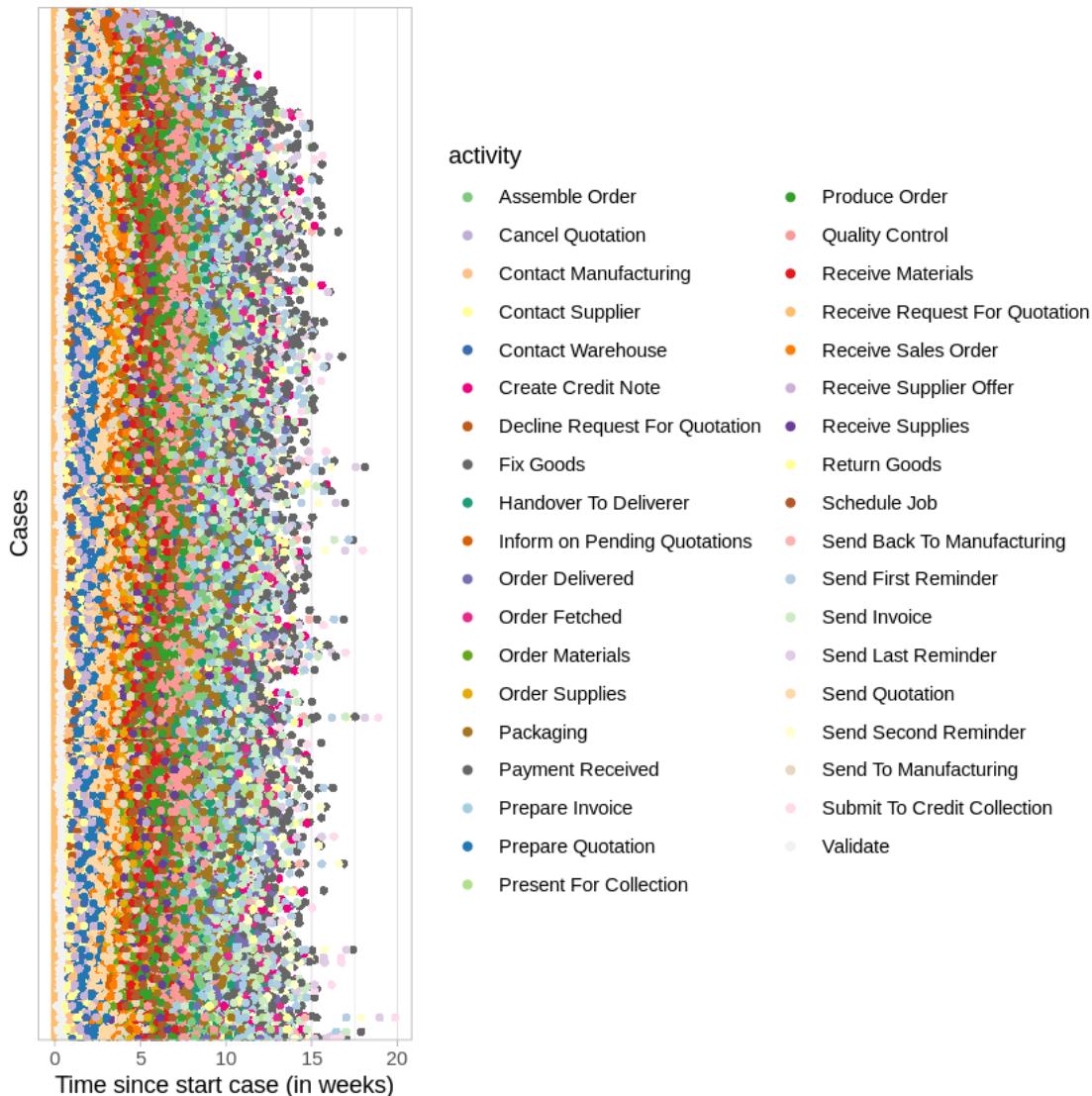
Warning message:
 "The `add` argument of `group_by()` is deprecated as of dplyr 1.0.0.
 Please use the `.add` argument instead.
 This warning is displayed once every 8 hours.
 Call `lifecycle::last_warnings()` to see where this warning was
 generated."
 Joining, by = "case_id"



```
[ ]: options(repr.plot.width=30, repr.plot.height=6)
jpeg("rplot.jpg", width = 350, height = 350)
# 2. Create the plot
curve(sin(x), from = 0, to=4*pi, n = 200)
# 3. Close the file
dev.off()
```

```
[14]: dotted_chart(
  order_to_cash,
  x="absolute",
  sort="end"
)
```

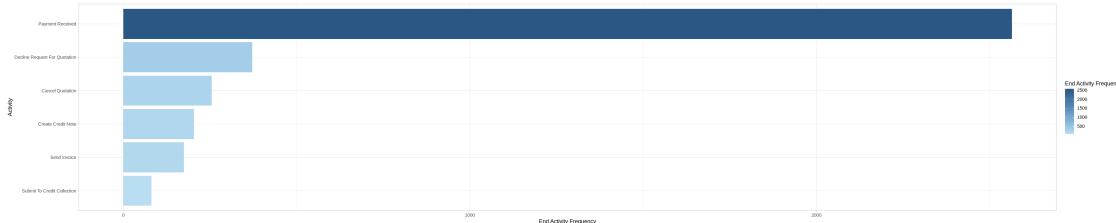
Warning message:
 "The `add` argument of `group_by()` is deprecated as of dplyr 1.0.0.
 Please use the `.`add` argument instead.
 This warning is displayed once every 8 hours.
 Call `lifecycle::last_warnings()` to see where this warning was
 generated."
 Joining, by = "case_id"



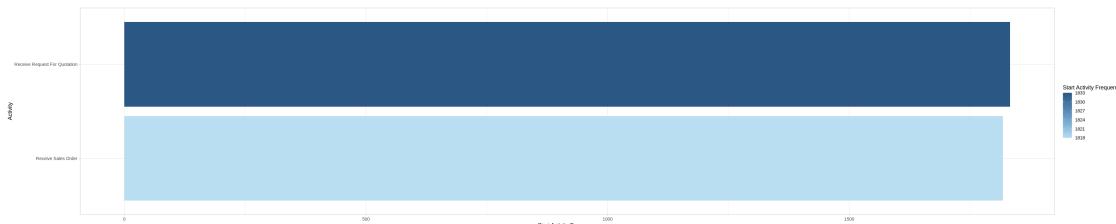
```
[101]: order_to_cash %>%
  filter_throughput_time(interval=c(5,30),units ="days")%>%
  process_map(
    type_edges=performance(mean, "hours"),
    type_nodes = frequency ("absolute_case"),
  )
```

HTML widgets cannot be represented in plain text (need html)

```
[61]: order_to_cash %>%
  end_activities(level = "activity")%>%
  plot()
```



```
[62]: order_to_cash %>%
      start_activities(level = "activity")%>%
      plot()
```



```
[ ]: order_to_cash %>%
      start_activities(level = "activity")
```

0.1 1. Summary

```
[125]: summary(order_to_cash)
```

Number of events: 75499
 Number of cases: 3651
 Number of traces: 1656
 Number of distinct activities: 37
 Average trace length: 20.67899

Start eventlog: 2017-01-01 12:13:56
 End eventlog: 2018-04-22 19:56:13

quotation_id	resource	activity	action
Length:75499	George : 7186	Packaging : 6048	Length:75499
Class :character	Andrea : 6594	Prepare Invoice: 6048	Class :character
Mode :character	Virginia: 6235	Produce Order : 6048	Mode :character
	Jonathan: 6047	Quality Control: 6048	
	Cheryl : 5381	Validate : 3666	

```

Louis      : 5039    Assemble Order : 3048
(Other)   :39017    (Other)        :44593
lifecycle      timestamp           sales_order_id
complete:25420 Min.    :2017-01-01 12:13:56 Length:75499
start     :50079  1st Qu.:2017-05-07 14:26:12 Class  :character
                  Median :2017-08-07 15:30:29 Mode   :character
                  Mean   :2017-08-07 23:16:03
                  3rd Qu.:2017-11-09 17:27:47
                  Max.   :2018-04-22 19:56:13

case_id          .order      is_cancelled follows_offer
Length:75499      Min.    : 1    Mode :logical  Mode :logical
Class  :character  1st Qu.:18876 FALSE:75244  FALSE:74038
Mode   :character   Median :37750  TRUE :255   TRUE :1461
                  Mean   :37750
                  3rd Qu.:56624
                  Max.   :75499

no_returns       payment_received type      is_declined
Mode :logical    Mode :logical    Length:75499  Mode :logical
FALSE:778        FALSE:81       Class  :character FALSE:372
TRUE :74721      TRUE :75418    Mode   :character TRUE :75127

```

```
[181]: resources(order_to_cash)
```

A tibble: 20 × 3

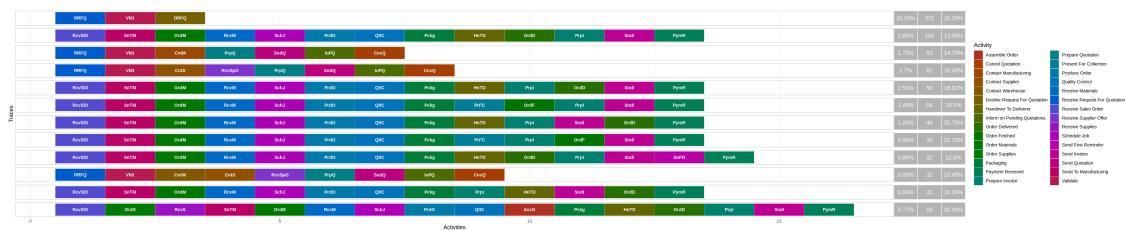
resource	absolute_frequency	relative_frequency
<fct>	<int>	<dbl>
George	5711	0.09815076
Andrea	5407	0.09292613
Jonathan	4777	0.08209879
Virginia	4686	0.08053484
Amy	3636	0.06248926
Katherine	3586	0.06162995
Cheryl	3519	0.06047847
Julia	3194	0.05489293
Phillip	3047	0.05236655
Gregory	3024	0.05197126
Louis	2567	0.04411714
Mary	2283	0.03923624
Steven	2266	0.03894408
Matthew	2083	0.03579899
Kimberly	1995	0.03428660
Jerry	1601	0.02751521
Tina	1520	0.02612312
Sara	1308	0.02247963
Diana	1022	0.01756436
Stephen	954	0.01639570

0.2 Cuántos casos?

```
[184]: n_cases(order_to_cash)
```

3651

```
[185]: trace_explorer(order_to_cash,type='frequent',coverage=0.25)
```

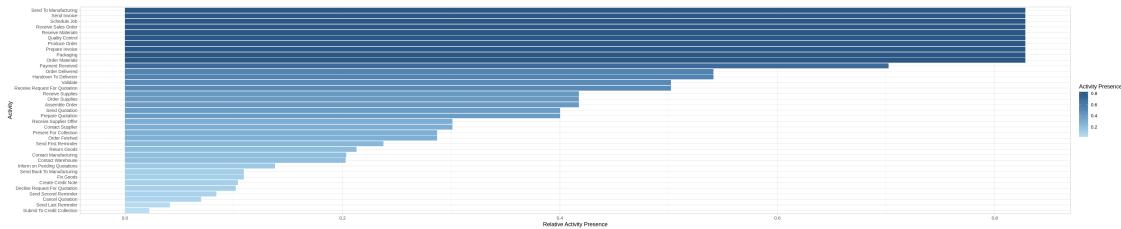


0.3 Cuántas actividades distintas?

```
[171]: n_activities(order_to_cash)
```

37

```
[255]: order_to_cash %>% activity_presence() %>% plot()
```



```
[569]: order_to_cash %>% filter_throughput_time(level="trace", interval = c(19.
    ↪8736, NA), unit="weeks")
```

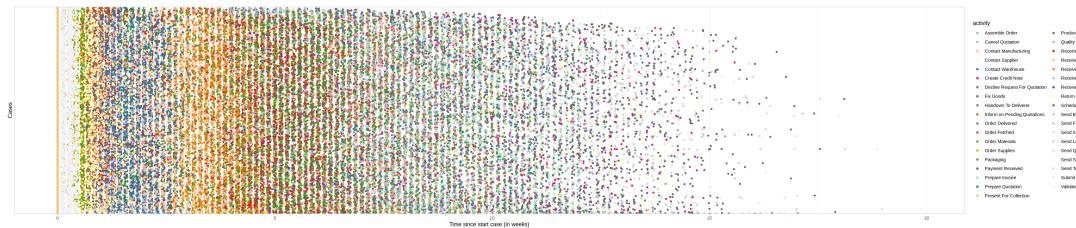
quotation_id <chr>	resource <fct>	activity <fct>	action <chr>	lifecycle <fct>
quo-816	Katherine	Validate	quo-816-validate	start
quo-816	Katherine	Validate	quo-816-validate	com
quo-816	Matthew	Contact Manufacturing	quo-816-13922	com
quo-816	Jonathan	Receive Request For Quotation	quo-816-13923	com
quo-816	Andrea	Send Quotation	quo-816-13925	com
quo-816	Matthew	Contact Supplier	quo-816-13926	com
quo-816	Matthew	Receive Supplier Offer	quo-816-13927	com
quo-816	Matthew	Contact Warehouse	quo-816-13928	com
quo-816	Jonathan	Prepare Quotation	quo-816-prepare	start
quo-816	Jonathan	Prepare Quotation	quo-816-prepare	com
quo-816	Jonathan	Receive Sales Order	order-17-59393-0005703	start
quo-816	Andrea	Send To Manufacturing	order-17-59393-0005704	start
quo-816	Steven	Order Supplies	order-17-59393-0014605	start
quo-816	Amy	Order Materials	order-17-59393-0014606	start
quo-816	Amy	Receive Supplies	order-17-59393-0014607	start
quo-816	Julia	Receive Materials	order-17-59393-0014608	start
quo-816	Gregory	Schedule Job	order-17-59393-0025499	start
A eventlog: 38 × 15	quo-816	Mary	Produce Order	order-17-59393-0025500
	quo-816	Louis	Quality Control	order-17-59393-0025501
	quo-816	Jerry	Assemble Order	order-17-59393-0025502
	quo-816	Tina	Fix Goods	order-17-59393-0025503
	quo-816	Cheryl	Packaging	order-17-59393-0035791
	quo-816	Sara	Present For Collection	order-17-59393-0035792
	quo-816	Phillip	Order Fetched	order-17-59393-0035793
	quo-816	Phillip	Return Goods	order-17-59393-0035794
	quo-816	Katherine	Send Back To Manufacturing	order-17-59393-0035795
	quo-816	Virginia	Prepare Invoice	order-17-59393-0046193
	quo-816	George	Send Invoice	order-17-59393-0046194
	quo-816	Virginia	Send First Reminder	order-17-59393-0046195
	quo-816	Virginia	Send Second Reminder	order-17-59393-0046196
	quo-816	George	Send Last Reminder	order-17-59393-0046197
	quo-816	Virginia	Submit To Credit Collection	order-17-59393-0046198
	quo-816	Mary	Produce Order	order-17-59393-0025500
	quo-816	Louis	Quality Control	order-17-59393-0025501
	quo-816	Jerry	Assemble Order	order-17-59393-0025502
	quo-816	Tina	Fix Goods	order-17-59393-0025503
	quo-816	Cheryl	Packaging	order-17-59393-0035791
	quo-816	Virginia	Prepare Invoice	order-17-59393-0046193

0.4 Cuántas trazas?

[449]: `n_traces(order_to_cash)`

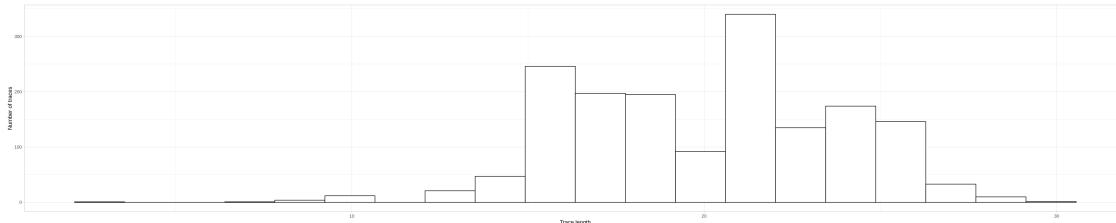
```
[284]: dotted_chart(  
        order_to_cash,  
        x="relative",  
        sort="end"  
)
```

Joining, by = "case_id"



0.4.1 histograma por largo de la traza

```
[372]: order_to_cash%>%
        trace_length(level="trace")%>%
        plot()
```



0.4.2 histograma de frecuencia

```
[451]: plot(unlist(traces(order_to_cash)[ "absolute_frequency" ]))
```



0.4.3 Las más frecuentes

```
[453]: trace_explorer(order_to_cash,type='frequent',coverage=0.2)
```



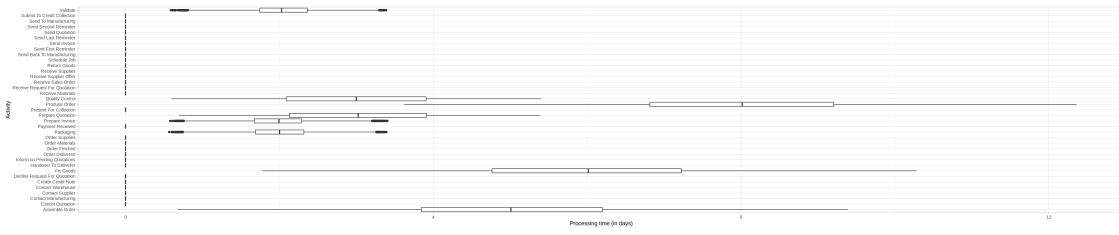
```
[597]: order_to_cash %>%
  throughput_time(level="trace", units = "weeks")%>%summary()
```

trace	relative_trace_frequency	min	
Length:1656	Min. :0.0002739	Min. : 0.3983	
Class :character	1st Qu.:0.0002739	1st Qu.: 9.2576	
Mode :character	Median :0.0002739	Median :11.1039	
	Mean :0.0006039	Mean :11.0461	
	3rd Qu.:0.0002739	3rd Qu.:12.7217	
	Max. :0.1018899	Max. :19.8739	
q1	mean	median	
Min. : 0.8548	Min. : 1.002	Min. : 1.002	
1st Qu.: 9.3188	1st Qu.: 9.443	1st Qu.: 9.445	
Median :11.1418	Median :11.161	Median :11.161	
Mean :11.1200	Mean :11.183	Mean :11.182	
3rd Qu.:12.7251	3rd Qu.:12.732	3rd Qu.:12.733	
Max. :19.8739	Max. :19.874	Max. :19.874	
max	st_dev	iqr	total
Min. : 1.593	Min. :0.0056	Min. :0.0000	Min. : 5.274
1st Qu.: 9.700	1st Qu.:0.3696	1st Qu.:0.0000	1st Qu.: 10.705
Median :11.265	Median :0.5615	Median :0.0000	Median : 12.590
Mean :11.318	Mean :0.5920	Mean :0.1257	Mean : 19.013
3rd Qu.:12.831	3rd Qu.:0.7746	3rd Qu.:0.0000	3rd Qu.: 15.569
Max. :19.874	Max. :1.9326	Max. :1.6040	Max. :646.685
NA's :1275			

0.5 Ventanas de tiempos por actividades.

```
[170]: n_activities(order_to_cash)
```

```
[467]: order_to_cash %>%
  processing_time("activity") %>%
  plot
```



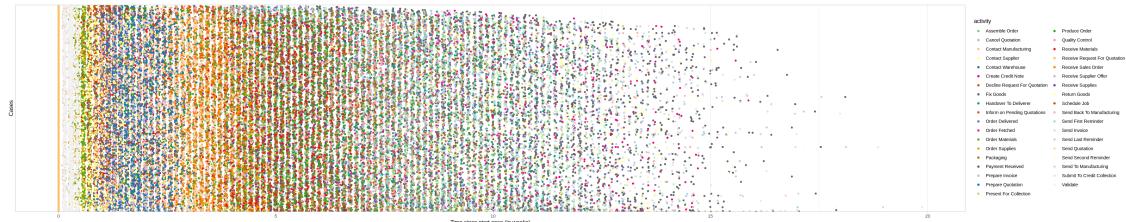
```
[327]: activities(order_to_cash)
```

activity <fct>	absolute_frequency <int>	relative_frequency <dbl>	
Order Materials	3024	0.051971265	
Packaging	3024	0.051971265	
Prepare Invoice	3024	0.051971265	
Produce Order	3024	0.051971265	
Quality Control	3024	0.051971265	
Receive Materials	3024	0.051971265	
Receive Sales Order	3024	0.051971265	
Schedule Job	3024	0.051971265	
Send Invoice	3024	0.051971265	
Send To Manufacturing	3024	0.051971265	
Payment Received	2564	0.044065583	
Handover To Deliverer	1976	0.033960059	
Order Delivered	1976	0.033960059	
Receive Request For Quotation	1833	0.031502423	
Validate	1833	0.031502423	
Assemble Order	1524	0.026191867	
Order Supplies	1524	0.026191867	
A tibble: 37 × 3	Receive Supplies	1524	0.026191867
	Prepare Quotation	1461	0.025109133
	Send Quotation	1461	0.025109133
	Contact Supplier	1099	0.018887705
	Receive Supplier Offer	1099	0.018887705
	Order Fetched	1048	0.018011205
	Present For Collection	1048	0.018011205
	Send First Reminder	868	0.014917678
	Return Goods	778	0.013370914
	Contact Manufacturing	743	0.012769395
	Contact Warehouse	741	0.012735022
	Inform on Pending Quotations	504	0.008661877
	Fix Goods	399	0.006857320
	Send Back To Manufacturing	399	0.006857320
	Create Credit Note	379	0.006513594
	Decline Request For Quotation	372	0.006393290
	Send Second Reminder	307	0.005276183
	Cancel Quotation	255	0.004382498
	Send Last Reminder	150	0.002577940
	Submit To Credit Collection	81	0.001392087

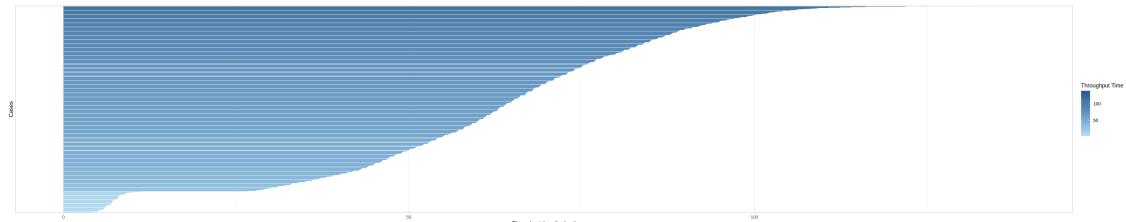
0.6 Duración de casos

```
[339]: dotted_chart(
    order_to_cash,
    x="relative",
    sort="end"
)
#Duración estimada? summary
```

Joining, by = "case_id"



```
[368]: order_to_cash %>%
    throughput_time(level="case", units = "days") %>%
    plot()
```

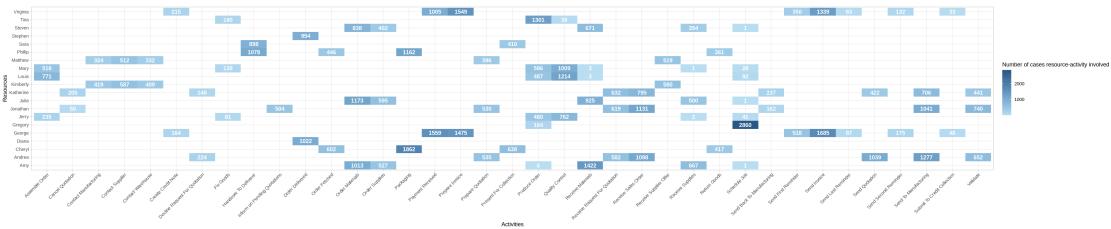


0.7 Personas que participan

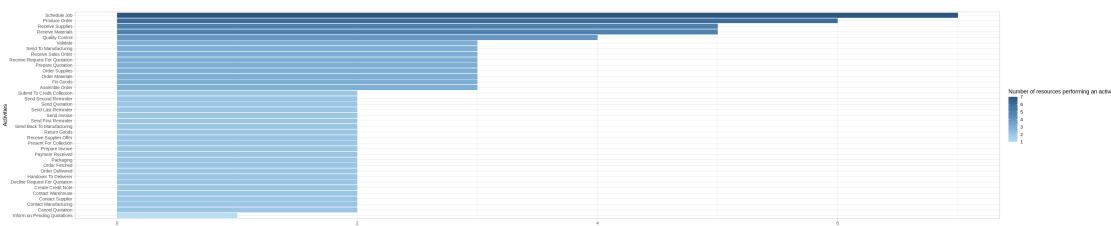
```
[360]: n_resources(order_to_cash)
```

20

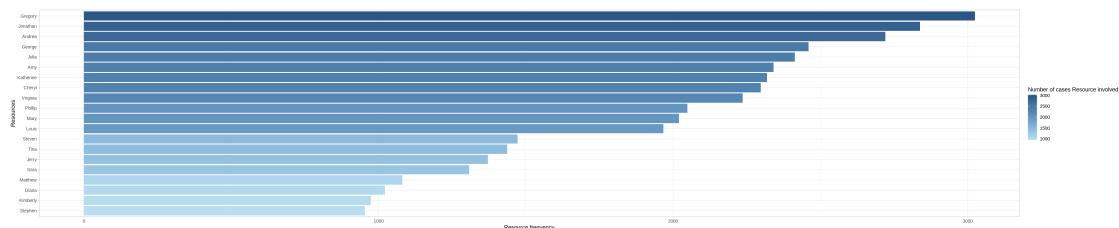
```
[548]: order_to_cash%>%
    resource_involvement(level = "resource-activity")%>%
    plot()
```



```
[549]: order_to_cash %>%
        resource_specialization(level="activity") %>%
        plot()
```



```
[550]: order_to_cash%>%
        resource_involvement(level = "resource")%>%
        plot()
```



1 2. Etapas

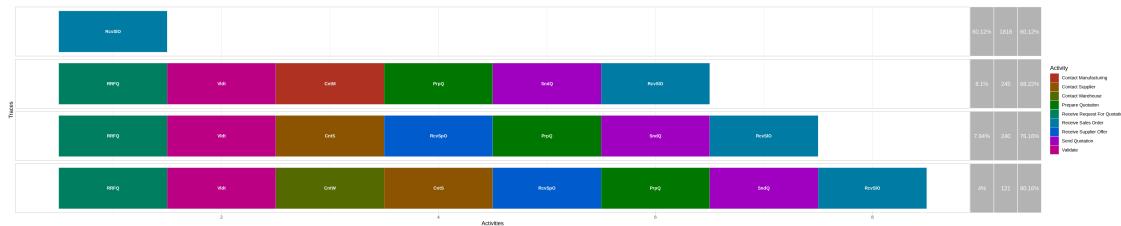
Los procesos son analizados mediante: * 1) Grafo de trazas. * 2) Exploración de trazas. * 3) Histograma de trazas. * 4) Resumen del proceso. * 5) Tiempo total del proceso.

1.0.1 Proceso 1: From start to Informan on Pending Quotations

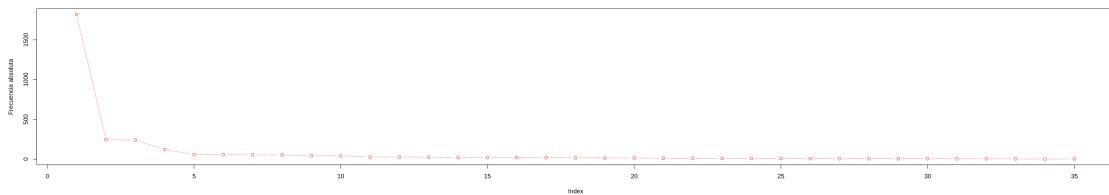
```
[551]: order_to_cash %>%
  filter_trim(end_activities = "Receive Sales Order") %>%
  process_map()
```

HTML widgets cannot be represented in plain text (need html)

```
[559]: order_to_cash%>%
  filter_trim(end_activities = "Receive Sales Order") %>%
  trace_explorer(coverage = 0.8)
```



```
[557]: plot(unlist((order_to_cash%>%
  filter_trim(end_activities = "Receive Sales Order") %>%
  traces(coverage = 0.4))["absolute_frequency"]), ylab="Frecuencia_absoluta", col="red", lty=3, type = "b")
```



```
[558]: order_to_cash%>%
  filter_trim(end_activities = "Receive Sales Order") %>%summary
```

Number of events: 13541
Number of cases: 3024
Number of traces: 35
Number of distinct activities: 10
Average trace length: 4.477844

Start eventlog: 2017-01-01 12:13:56
End eventlog: 2018-01-29 14:04:59

quotation_id	resource	activity
Length:13541	Andrea :4092	Receive Sales Order :3024
Class :character	Jonathan :3627	Prepare Quotation :2412
Mode :character	Katherine:2124	Validate :2412
	Matthew :2051	Receive Request For Quotation:1206
	Kimberly :1647	Send Quotation :1206

```

          Amy      : 0   Contact Supplier      : 907
          (Other) : 0   (Other)                  : 2374
action      lifecycle      timestamp
Length:13541 complete:8105  Min.    :2017-01-01 12:13:56
Class :character start    :5436   1st Qu.:2017-04-11 12:23:23
Mode  :character                   Median :2017-07-11 12:16:01
                                         Mean   :2017-07-14 06:23:01
                                         3rd Qu.:2017-10-17 16:34:33
                                         Max.   :2018-01-29 14:04:59

sales_order_id      case_id      .order      is_cancelled
Length:13541        Length:13541    Min.     : 1   Mode :logical
Class :character    Class :character  1st Qu.: 3386 FALSE:13541
Mode  :character    Mode  :character  Median  : 6771
                           Mean   : 6771
                           3rd Qu.:10156
                           Max.   :13541

follows_offer      no_returns    payment_received      type
Mode :logical       Mode:logical   Mode:logical      Length:13541
FALSE:12335         TRUE:13541     TRUE:13541       Class :character
TRUE  :1206           &nbsp;           &nbsp;           Mode  :character

```

```

is_declined
Mode:logical
TRUE:13541

```

```
[565]: order_to_cash%>%
  filter_trim(end_activities = "Receive Sales Order") %>%
  throughput_time(level = "case", units = "weeks")%>%summary
```

```

case_id      throughput_time
Length:3024    Min.    :0.000
Class :character 1st Qu.:0.000
Mode  :character Median :0.000
                           Mean   :1.409
                           3rd Qu.:3.286
                           Max.   :5.439

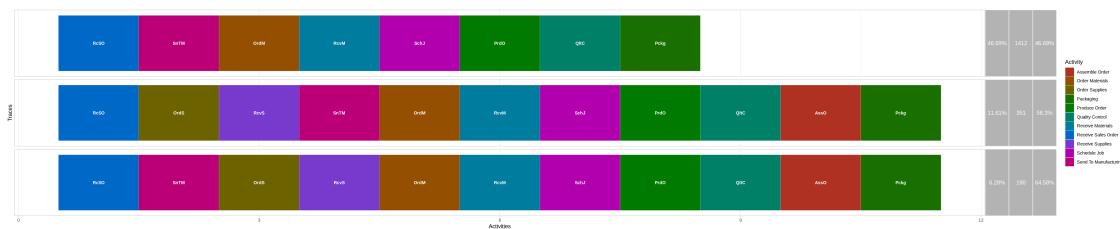
```

1.0.2 Proceso 2: From Receive Sales Order to Packaging

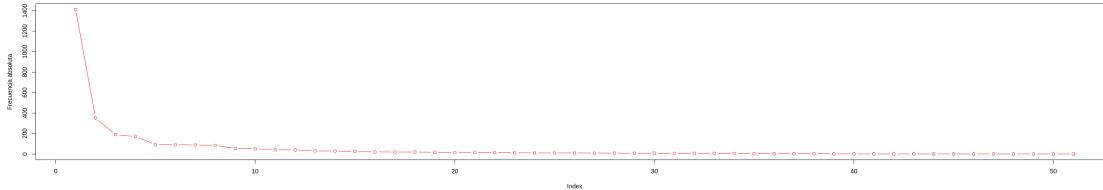
```
[472]: order_to_cash%>%
  filter_trim(start_activities = "Receive Sales Order", end_activities = %>%
  ~"Packaging") %>%
  process_map()
```

HTML widgets cannot be represented in plain text (need html)

```
[480]: order_to_cash%>%
  filter_trim(start_activities = "Receive Sales Order", end_activities = %>%
  ~"Packaging") %>%
  trace_explorer(coverage = 0.6)
```



```
[520]: plot(unlist((order_to_cash%>%
  filter_trim(start_activities = "Receive Sales Order", end_activities = %>%
  ~"Packaging") %>%
  traces(coverage = 0.4))["absolute_frequency"])), ylab="Frecuencia absoluta", col="red", type = "b")
```



```
[546]: order_to_cash%>%
  filter_trim(start_activities = "Receive Sales Order", end_activities = %>%
  ~"Packaging") %>%
  summary
```

Number of events: 39360
 Number of cases: 3024
 Number of traces: 51
 Number of distinct activities: 11

Average trace length: 13.01587

Start eventlog: 2017-01-01 13:55:11

End eventlog: 2018-03-15 15:52:17

quotation_id	resource	activity	
Length:39360	Louis : 5039	Packaging : 6048	
Class :character	Mary : 4258	Produce Order : 6048	
Mode :character	Cheryl : 3724	Quality Control : 6048	
	Amy : 3642	Assemble Order : 3048	
	Julia : 3194	Order Materials : 3024	
	Gregory: 3188	Receive Materials: 3024	
	(Other):16315	(Other) :12120	
action	lifecycle	timestamp	
Length:39360	complete:10596	Min. :2017-01-01 13:55:11	
Class :character	start :28764	1st Qu.:2017-05-01 19:32:04	
Mode :character		Median :2017-08-02 12:41:36	
		Mean :2017-08-02 20:06:50	
		3rd Qu.:2017-11-05 10:54:33	
		Max. :2018-03-15 15:52:17	
sales_order_id	case_id	.order	is_cancelled
Length:39360	Length:39360	Min. : 1	Mode :logical
Class :character	Class :character	1st Qu.: 9841	FALSE:39360
Mode :character	Mode :character	Median :19680	
		Mean :19680	
		3rd Qu.:29520	
		Max. :39360	
follows_offer	no_returns	payment_received	type
Mode :logical	Mode:logical	Mode:logical	Length:39360
FALSE:39360	TRUE:39360	TRUE:39360	Class :character
			Mode :character
is_declined			
Mode:logical			
TRUE:39360			

```
[566]: order_to_cash%>%
  filter_trim(start_activities = "Receive Sales Order", end_activities = "Packaging") %>%
  throughput_time(level = "case", units = "weeks")%>%summary
```

case_id	throughput_time
Length:3024	Min. :2.539
Class :character	1st Qu.:4.143
Mode :character	Median :5.149
	Mean :5.250
	3rd Qu.:6.383
	Max. :8.586

1.0.3 Proceso 3: From Packaging

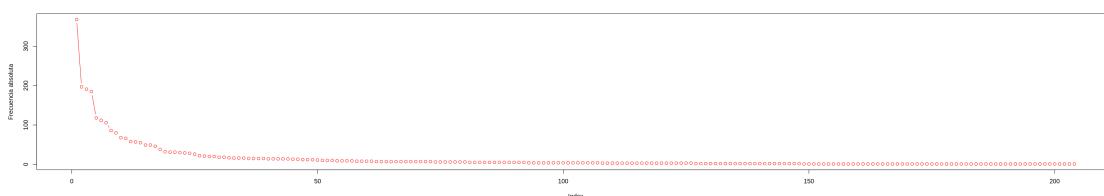
```
[475]: order_to_cash%>%
  filter_trim(start_activities = "Packaging")%>%
  process_map()
```

HTML widgets cannot be represented in plain text (need html)

```
[482]: order_to_cash%>%
  filter_trim(start_activities = "Packaging")%>%
  trace_explorer(coverage = 0.4)
```



```
[522]: plot(unlist((order_to_cash%>%
  filter_trim(start_activities = "Packaging")%>%
  traces(coverage = 0.4))["absolute_frequency"]), ylab="Frecuencia_absoluta", col="red", type = "b")
```



```
[547]: order_to_cash%>%
  filter_trim(start_activities = "Packaging")%>%
  summary
```

Number of events: 27492
 Number of cases: 3024
 Number of traces: 204
 Number of distinct activities: 16
 Average trace length: 9.09127

Start eventlog: 2017-01-22 16:38:43
 End eventlog: 2018-04-22 19:56:13

	quotation_id	resource	activity	
Length:27492	George :7186	Packaging	:6048	
Class :character	Virginia:6235	Prepare Invoice	:6048	
Mode :character	Cheryl :5381	Send Invoice	:3024	
	Phillip :4209	Payment Received	:2564	
	Sara :1308	Handover To Deliverer	:1976	
	Diana :1022	Order Delivered	:1976	
	(Other) :2151	(Other)	:5856	
	action	lifecycle	timestamp	
Length:27492	complete: 6447	Min.	:2017-01-22 16:38:43	
Class :character	start :21045	1st Qu.:	2017-05-29 13:06:07	
Mode :character		Median :	2017-08-29 17:35:47	
		Mean :	2017-08-30 10:14:06	
		3rd Qu.:	2017-12-03 11:28:41	
		Max. :	2018-04-22 19:56:13	
	sales_order_id	case_id	.order	is_cancelled
Length:27492	Length:27492	Min. :	1	Mode :logical
Class :character	Class :character	1st Qu.:	6874	FALSE:27492
Mode :character	Mode :character	Median :	13746	
		Mean :	13746	
		3rd Qu.:	20619	
		Max. :	27492	
	follows_offer	no_returns	payment_received	type
Mode :logical	Mode :logical	Mode :logical	Length:27492	
FALSE:27492	FALSE:778	FALSE:81	Class :character	
	TRUE :26714	TRUE :27411	Mode :character	

is_declined
 Mode:logical

TRUE:27492

```
[567]: order_to_cash%>%
  filter_trim(start_activities = "Packaging")%>%
  throughput_time(level = "case",units = "weeks")%>%summary
```

```
case_id      throughput_time
Length:3024      Min.    :1.322
Class  :character 1st Qu.:2.598
Mode   :character Median  :3.123
                  Mean    :3.519
                  3rd Qu.:4.006
                  Max.    :9.701
```

```
[573]: order_to_cash %>%
  activities
```

activity <fct>	absolute_frequency <int>	relative_frequency <dbl>
Order Materials	3024	0.051971265
Packaging	3024	0.051971265
Prepare Invoice	3024	0.051971265
Produce Order	3024	0.051971265
Quality Control	3024	0.051971265
Receive Materials	3024	0.051971265
Receive Sales Order	3024	0.051971265
Schedule Job	3024	0.051971265
Send Invoice	3024	0.051971265
Send To Manufacturing	3024	0.051971265
Payment Received	2564	0.044065583
Handover To Deliverer	1976	0.033960059
Order Delivered	1976	0.033960059
Receive Request For Quotation	1833	0.031502423
Validate	1833	0.031502423
Assemble Order	1524	0.026191867
Order Supplies	1524	0.026191867
A tibble: 37 × 3		
Receive Supplies	1524	0.026191867
Prepare Quotation	1461	0.025109133
Send Quotation	1461	0.025109133
Contact Supplier	1099	0.018887705
Receive Supplier Offer	1099	0.018887705
Order Fetched	1048	0.018011205
Present For Collection	1048	0.018011205
Send First Reminder	868	0.014917678
Return Goods	778	0.013370914
Contact Manufacturing	743	0.012769395
Contact Warehouse	741	0.012735022
Inform on Pending Quotations	504	0.008661877
Fix Goods	399	0.006857320
Send Back To Manufacturing	399	0.006857320
Create Credit Note	379	0.006513594
Decline Request For Quotation	372	0.006393290
Send Second Reminder	307	0.005276183
Cancel Quotation	255	0.004382498
Send Last Reminder	150	0.002577940
Submit To Credit Collection	81	0.001392087

1.0.4 Evaluamos los casos problemáticos

```
[596]: order_to_cash%>%
  filter_activity_presence(activities = c("Fix Goods", "Send FirstReminder"), method = "all")%>%
  throughput_time(level = "case", units = "weeks")%>%summary
```

case_id	throughput_time
---------	-----------------

```

Length:136          Min.    : 7.834
Class :character   1st Qu.:11.439
Mode  :character   Median :13.164
                  Mean   :13.164
                  3rd Qu.:14.586
                  Max.   :19.874

```

1.0.5 Obtenemos las trazas de menor duración

```
[601]: order_to_cash%>%
  filter_throughput_time(interval = c(NA,5),units="weeks")%>%
  filter_activity_presence(activities = "Receive Sales Order",method = "all")%>%
  trace_explorer
```

Warning message in trace_explorer():
 "No coverage or number of traces set. Defaulting to 0.2 for frequent traces."



```
[583]: ?filter_activity_presence
```