R Visualizations

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Intent

The goal is to provide brief introduction on how R visualizations can be made.

1. Dataset preparation

The data I will be using is Arrow-APR's ECBL (End Customer Backlog), combined with ADI Backlog, inventory, shipment, in-transit quantity, and distributor-submitted raw report for details on demand type.

QV Dashboard for ECBL Validation: https://qv.web.analog.com/QvAJAXZfc/opendoc.htm?document=ops_world%5Cdisti%20ec%20bl%20support.qvw&lang=en-US&host=QVS%40QVCluster

```
library(tidyverse)
library(readr)
library(lubridate)
#map disti id code
DistiID <- read_csv("DistiID.csv")[,-2]
colnames(DistiID)[2] <- "DistributorID"
#read file from QV
ecbl.val <- read_csv(file.path("History/2021-01-08/ECBL_val.csv"))[-1,-c(3, 5:7,9)] %>%
  filter(`Tracking #` == 1041724)
ecbl.val <- ecbl.val %>%
  merge(DistiID, by.x = "Tracking #", by.y = "Sold To # (Pur)")
ecbl.val <- ecbl.val[,c(1, 11, 3:10)] %>%
  group_by(DistributorID, Material)
ecbl.val$`Deficient Value` <- gsub("[(]", "-", ecbl.val$`Deficient Value`)
ecbl.val$`Deficient Value` <- gsub("[)$,]", "", ecbl.val$`Deficient Value`)
ecbl.val$`Deficient Value` <- ecbl.val$`Deficient Value` %>% as.numeric()
#join fcst and firm
Raw_Data <- read_csv("~/PCM/ECBL_POS_INV/Raw_Data.csv")
Raw_Data$`BL-Type`[Raw_Data$`BL-Type` == "Firm"] <- "FIRM"
Raw_Data$CRDate <- Raw_Data$CRDate %>% ymd()

data_to_join <- Raw_Data %>% select(DistributorID, PartNumber, BLOGQTY, CRDate,`BL-Type`) %>%
  filter(CRDate < Sys.Date()+86) %>% #remember to run this on Fridays
  group_by(DistributorID, PartNumber, `BL-Type`) %>%
  dplyr::summarise(QTY = sum(BLOGQTY)) %>%
  ungroup()
data_to_join$DistributorID[data_to_join$DistributorID == "ARROW APR"] <-  "ARROW-APR"

ecbl.val <- merge(data_to_join, ecbl.val, by.x = c("DistributorID", "PartNumber"), by.y = c("DistributorID", "Material"))
ecbl.val <- ecbl.val %>% spread("BL-Type", QTY, fill = 0)

#make it into wide data
ecbl.val <- ecbl.val %>%
  mutate(`ECBL CRD OD - 13Wks Qty` = FIRM + FCST + BOND,
         `Deficient Qty` = `ECBL CRD OD - 13Wks Qty` - `Total ECBL Support Qty`)
```

1.1 Data Table View

The tidied table will look like this (partial view):

```
library(knitr)
kable(ecbl.val[1:10,], caption = "Partial Table View")
```

Partial Table View

DistributorID	PartNumber	Tracking #	ECBL CRD OD - 13Wks Qty	Inv Qty	PVBL CRD OD - 13Wks Qty	In Transit Qty (TA Only)	Total ECBL Support Qty	Deficient Qty	Deficient Value	BOND	FCST	FIRM
ARROW-APR	5962-0423001QXC	1041724	100	1	99	0	100	0	0	0	0	100
ARROW-APR	5962-85127013A	1041724	196	44	65	114	223	-27	-10763	0	0	196
ARROW-APR	5962-8851301GA	1041724	760	0	0	0	0	760	107464	0	0	760
ARROW-APR	5962-8856501V2A	1041724	50	0	50	0	50	0	0	0	0	50
ARROW-APR	5962-8876401LX	1041724	754	174	580	0	754	0	0	0	0	754
ARROW-APR	5962-8876601LA	1041724	784	184	0	0	184	600	53076	0	0	784
ARROW-APR	5962-8951801RA	1041724	155	0	155	0	155	0	0	0	0	155
ARROW-APR	5962-8982503PA	1041724	140	0	140	0	140	0	0	0	0	140
ARROW-APR	5962-9078501MLA	1041724	4650	802	2848	0	3650	1000	101368	0	0	4650

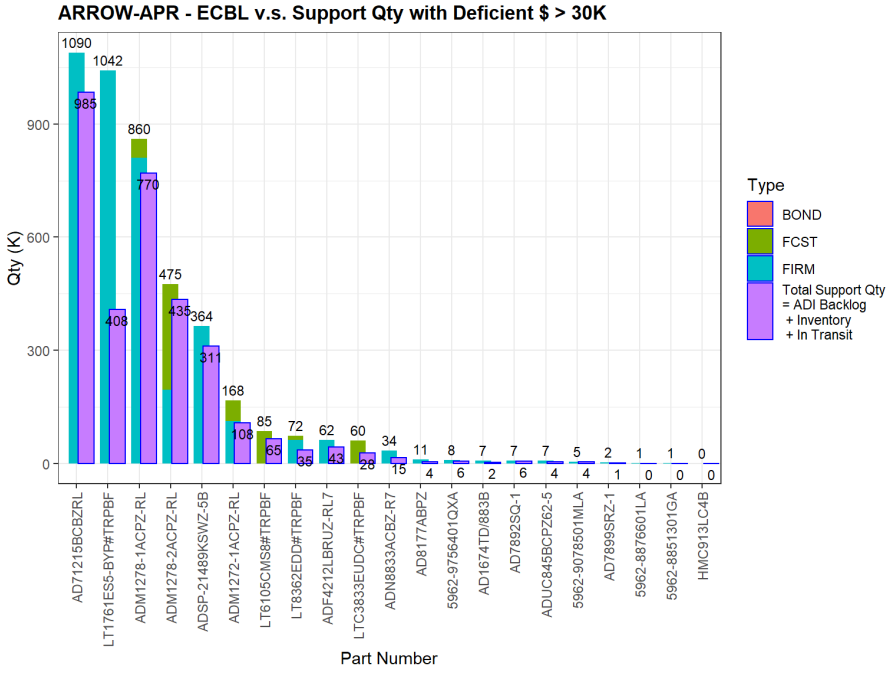
DistributorID	PartNumber	Tracking #	ECBL CRD OD - 13Wks Qty	Inv Qty	PVBL CRD OD - 13Wks Qty	In Transit Qty (TA Only)	Total ECBL Support Qty	Deficient Qty	Deficient Value	BOND	FCST	FIRM
ARROW-APR	5962-9176402M3A	1041724	200	0	200	0	200	0	0	0	0	200

2. Bar Chart

Next, we can make a bar chart:

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

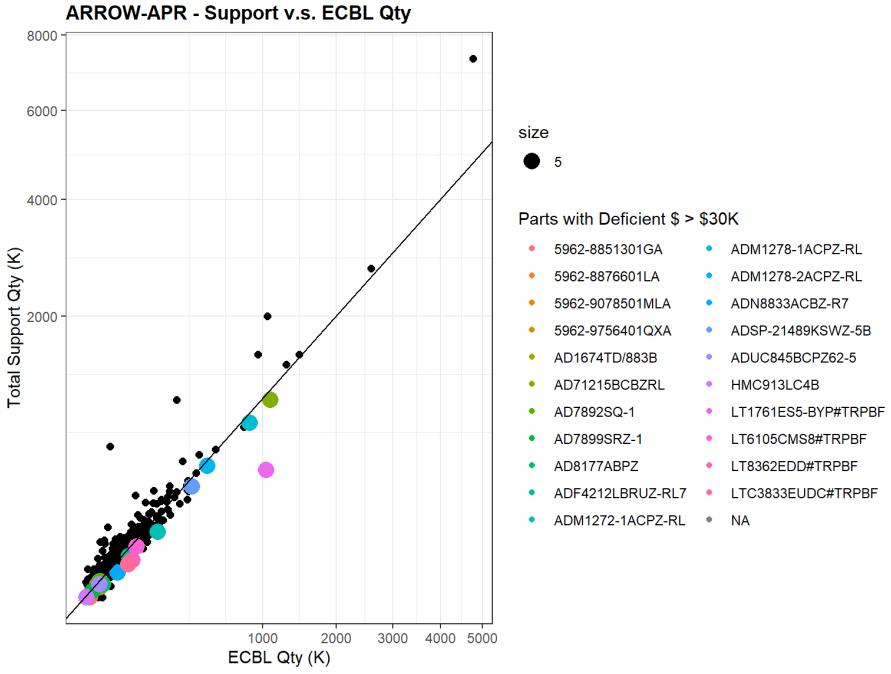
```
ggplot() +
  geom_col(data = by_type_data, aes(y=Qty_by_type/1000, x=reorder(PartNumber, -Qty_by_type), fill=Type),
           position="stack", width = 0.5) +
  geom_col(data = total_data, aes(y=`Total ECBL Support Qty`/1000, x=PartNumber,
                                  fill="Total Support Qty\n= ADI Backlog\n + Inventory\n + In Transit"),
           position = position_nudge(x = 0.3), width = 0.5, colour = "blue")+
    geom_text(data = no.type, aes(y=Qty/1000, x=reorder(PartNumber, -Qty), label = round(Qty/1000,0)),
              position=position_dodge(width=0.9), vjust=-0.5, size=3) +
    geom_text(data = total_data, aes(y=`Total ECBL Support Qty`/1000, x=PartNumber, label = round(`Total ECBL Support Qty`/1000,0)),
              position = position_nudge(x = 0.3), vjust=1.5, size=3) +
    ggtitle("ARROW-APR - ECBL v.s. Support Qty with Deficient $ > 30K")+
    ylab("Qty (K)") +
    xlab("Part Number")+ theme_bw()+
    theme(plot.title = element_text(size = 12.5, face = "bold"), axis.text.x = element_text(angle=90, vjust=0.5, hjust = 1))
```



3. Scatter Plot

A scatter plot:

```
ecbl.val %>%
    ggplot + geom_point(aes(x = `ECBL CRD OD - 13Wks Qty`/1000, y = `Total ECBL Support Qty`/1000), size = 2)+
    geom_point(data = ecbl.val[ecbl.val$`Deficient Value` > 30000,],
               aes(x = (`ECBL CRD OD - 13Wks Qty`/1000), y = (`Total ECBL Support Qty`/1000), col=PartNumber, size = 5)) +
    ggtitle("ARROW-APR - Support v.s. ECBL Qty") +
    xlab("ECBL Qty (K)") +
    ylab("Total Support Qty (K)")+ theme_bw()+
    theme(plot.title = element_text(size = 12.5, face = "bold"))+
    geom_abline() +
    scale_y_sqrt() +
    scale_x_sqrt() +
    scale_colour_discrete("Parts with Deficient $ > $30K")
```



4. Lollipop Chart

Or a lollipop chart

```
## `summarise()` regrouping output by 'DistributorID' (override with `.groups` argument)
```

```
dat.loll %>%
    filter(`Support %` < 100 ,abs(`Deficient Value`)>30000) %>%
    ggplot(aes(x=reorder(PartNumber, `Support %`), y=`Support %`, label = round(`Support %`,0))) +
    geom_segment(aes(x = reorder(PartNumber, `Support %`), xend = PartNumber, y = 0, yend = `Support %`))+
    geom_point(color="orange", size=7) +
    theme(plot.title = element_text(size = 12, face = "bold"), axis.text.x = element_text(angle=90, vjust=0.5, hjust = 1))+
    scale_y_continuous(limits = c(0,100))+
    geom_text(size = 4.5)+
    ggtitle("Support % of Parts with Deficient $ > 30K: ARROW-APR")+
    ylab("Support % (Total Disti Support Qty/ 13-Wk ECBL Qty)")+
    xlab("Part Number")+
    theme_bw()+
    coord_flip()
```