

Project 3 - How long do our clients pay?

Andy Shih

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Data Cleaning, wrangling, and analysis

我要解決的問題是我要找出公司的每筆訂單在簽了收據後，哪些客戶是拖延了超過 3 天或甚至 5 天後才付款（公司的目標是 3 天內要接受到付款才會出貨以維持健康的現金流）

- 我首先讀取 excel 檔，接著匿名掉一些欄位，然後我運用 dplyr package 去做出新的 dataframe，從大型資料表中做聚合，把資料用銷售專員、以及客戶公司來做分類，統整出平均的付款時間、平均每單的價格、以及各組的樣本數。
- 此任務運用 Excel 或是 SQL 也可以做得出來，但是 Excel 的問題是在做資料清洗時會較麻煩，且當樣本數更大時，速度會變慢，但是 R 在這個規模下不受影響，且在做成表格以及直接輸出 PDF 或是 HTML 檔做出報告方便許多。至於 SQL，由於舊的公司沒有把資料存在一個 database management system 做成關聯資料庫，因此用外部統計軟體像是 R 即可以完成工作

```
# Load required packages
library(dplyr)
library(tidyrr)
library(readxl)

# Load the Excel sheet
project3 <- read_excel("/Users/andy/B futurist/project/data/Trade Support - Logistics Tracking.xlsx", sheet = "Logistics")

# Mask the names of the sellers
project3$Seller <- substr(project3$Seller, 2, nchar(project3$Seller)-1)

# Mask the names of the customers
project3$Customer <- paste("abc", substr(project3$Customer, 5, nchar(project3$Customer)-3), "xyz")

# I put two parameters in group_by() to identify what traders correspond to a customer (the best classification)
mean_workdays1 <- as.data.frame(project3 %>% group_by(Customer, Seller) %>% drop_na() %>% summarize(mean_workdays_to_pay = mean(workdays_to_pay, na.rm = TRUE),
  number_of_invoices = n()) %>% mutate(five_days = ifelse(mean_workdays_to_pay >= 5, 1, 0))

# View(mean_workdays1)
```

接著我將剛剛製作的 dataframe 分出一些子集

```
# subsets the master dataframe created above to better summarize
df_3days <- subset(mean_workdays1, three_days == 1 & five_days == 0)
df_5days <- subset(mean_workdays1, five_days == 1)
```

超過 3 天才付款的公司以及一些統計數據

```
##                               Customer Seller
## 3                             abc  FASHION xyz      mr
```

## 5	abc	Fragrances of Paris	xyz	mr
## 13		abc KONG STAR LINK LIM	xyz	ophi
## 17	abc	PROFUMI S.A.S. DI SOLLA GIOVA	xyz	mr
## 28		abc A INTERNATIONAL TRADING LIM	xyz	avid
## 36		abc AYKONG TECHNOLOGY	xyz	avid
## 39		abc BLUE (HONGKONG) TRADING CO., L	xyz	avid
## 55	abc	ICIOS DE MEDIACION COMERCIAL SEMECO, S.L	xyz	mr
## 57		abc IUM PERFUMES TRADING	xyz	ebastia
## 61		abc LOBAL DISTRIBUTORS	xyz	avvin
## 62		abc LY PATH LIM	xyz	mr
## 63	abc	MATI TRADING MATEUSZ LIGECKI PC&HB INTERNATIONAL GR	xyz	icha
## 66		abc MAX INDUSTRIAL LIM	xyz	ophi
## 69		abc Min Hui (Hongkong) Trading Co.,L	xyz	ophi
## 74		abc NDS SP. Z O.O. S	xyz	aku
## 79		abc O G	xyz	.Hauc
## 81		abc OP	xyz	mr
## 84		abc PACT SP. Z.O.O. SP.	xyz	mr
## 88		abc RAGRANCES	xyz	ebastia
## 89		abc SA	xyz	arsel
## 95		abc TO FRANCO PERFUMERIAS S.L	xyz	mr
## 105	abc	acia Internazionale di Ciro Cozzolino & C. S.n	xyz	mr
## 106		abc acie Centrali	xyz	mr
## 119		abc iskills	xyz	avvin
## 120		abc l Attractive Perfumes L.	xyz	ebastia
## 123		abc ng	xyz	mr
## 124		abc nternatio	xyz	avid
## 141		abc umeria Internacional	xyz	ssa
##	mean_invoice_amount	number_of_invoices		
## 3	31098.00	4		
## 5	92050.38	8		
## 13	55255.79	1		
## 17	12769.20	1		
## 28	26200.00	1		
## 36	17540.19	11		
## 39	36193.10	2		
## 55	43767.37	9		
## 57	19900.38	1		
## 61	7278.56	1		
## 62	45696.16	2		
## 63	10750.00	1		
## 66	20098.92	1		
## 69	20060.00	1		
## 74	15252.39	1		
## 79	20830.29	1		
## 81	3007.50	1		
## 84	2804.50	2		
## 88	48442.56	3		
## 89	11273.92	2		
## 95	149784.00	1		
## 105	10650.00	3		
## 106	33937.00	3		
## 119	12387.12	1		
## 120	20241.74	1		
## 123	28795.42	2		

## 124	39726.95	1
## 141	12506.40	1

超過 5 天才付款的公司以及一些統計數據

##	Customer	Seller
## 2	abc ELE LIMi xyz	ia
## 6	abc G xyz	avid
## 7	abc Global Limi xyz	avid
## 8	abc Global Limi xyz	yej
## 11	abc KONG LENJOY FASHION (add shipment co xyz	ophi
## 14	abc Line xyz	arsel
## 18	abc SUNLIGHT(CHINA) LIMi xyz	avid
## 20	abc TRADING INTERNATIONAL S xyz	mr
## 22	abc WORLDWIDE LIMi xyz	avid
## 29	abc A(HK)TRADING LIMi xyz	arsel
## 33	abc AM EXP xyz	mr
## 38	abc AYKONG TECHNOLOGY xyz	ophi
## 42	abc EAUTY xyz	mr
## 44	abc ERSAL PERFU xyz	avvin
## 45	abc ES, FRAGANCIAS Y COSMÉTICOS S xyz	ssa
## 50	abc GIFTS PLUS xyz	mr
## 52	abc HA SUPPLY CHAIN LIMi xyz	avid
## 53	abc HANT TRADING LIMi xyz	avid
## 64	abc MAVANCE GROUPEM xyz	avid
## 65	abc MAX INDUSTRIAL LIMi xyz	avid
## 67	abc MI EUR xyz	yej
## 68	abc MIK GENRAL TRADING L. xyz	avid
## 73	abc NA 7 E xyz	avid
## 75	abc NDS SP. Z O.O. S xyz	mr
## 76	abc NO S.R xyz	omm
## 77	abc NSHU xyz	avid
## 80	abc OND PHARMACEUTICALS L xyz	ebastia
## 83	abc ORY INTERNATIONAL (USA), xyz	ebastia
## 90	abc SA xyz	er
## 92	abc T DAMOUR TRADING xyz	ebastia
## 93	abc TIGE GROUP INTERNATIO xyz	mr
## 94	abc TIVE VENTURES xyz	avvin
## 97	abc UM B xyz	ebastia
## 98	abc UME CENTER OF AMER xyz	mr
## 99	abc UME SOURCE xyz	avvin
## 104	abc acia Internazionale di Ciro Cozzolino & C. S.n xyz	ebastia
## 107	abc akeup S xyz	omm
## 111	abc co xyz	ebastia
## 115	abc i Trading Z xyz	mr
## 118	abc inumnow B xyz	ebastia
## 129	abc ress International s.r xyz	ebastia
## 132	abc saction System Servis, s.r xyz	aku
## 136	abc ty Care Global Sp. xyz	mr
## 137	abc uch of scent PTY xyz	ebastia
## 138	abc um Company Sp. z o.o. S.K xyz	mr
## 143	abc ums Canada I xyz	mr
##	mean_invoice_amount number_of_invoices	

## 2	85399.93	5
## 6	60078.00	2
## 7	15840.00	1
## 8	6393.61	2
## 11	16856.94	1
## 14	14132.63	1
## 18	126000.00	2
## 20	38191.57	2
## 22	20830.00	1
## 29	29502.53	3
## 33	66982.10	14
## 38	18600.00	1
## 42	39615.78	3
## 44	38263.26	1
## 45	32590.00	2
## 50	13923.41	1
## 52	39460.16	1
## 53	12666.00	1
## 64	21568.28	5
## 65	20160.00	1
## 67	12027.95	1
## 68	13254.26	2
## 73	14052.03	1
## 75	36172.96	16
## 76	23431.06	9
## 77	23435.02	2
## 80	37800.00	1
## 83	99803.85	6
## 90	7092.14	2
## 92	12475.91	2
## 93	50622.54	1
## 94	24512.50	2
## 97	28162.75	2
## 98	74778.00	3
## 99	48306.14	2
## 104	58667.70	19
## 107	8553.64	1
## 111	31910.88	1
## 115	49717.69	5
## 118	92987.01	2
## 129	53928.00	1
## 132	7927.86	1
## 136	7863.10	1
## 137	27346.56	1
## 138	27600.00	1
## 143	35056.13	1