Storytelling with Data

Unboxing Logistics Event
22nd September 2022

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Frazen Tolentino-Zondervan, Phd

Lecturer

- Supply Chain, Logistics, E-Fulfillment, Data Driven techniques (Storytelling with Data, Blockchain and Simulation in Logistics)

Research interests

- Sustainable supply chain and logistics
- Blockchain use cases in supply chain
- Data driven supply chain

Website: frazentolentinozondervan.com

FTZ Consulting

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Once Upon A Time…

And Other Data Stories

3

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CREATIVE
BRAND
CONTENT
MARKETING
STORYTELLING
MEDIA
VIRAL
COMMUNICATION
EMOTION
SHARE

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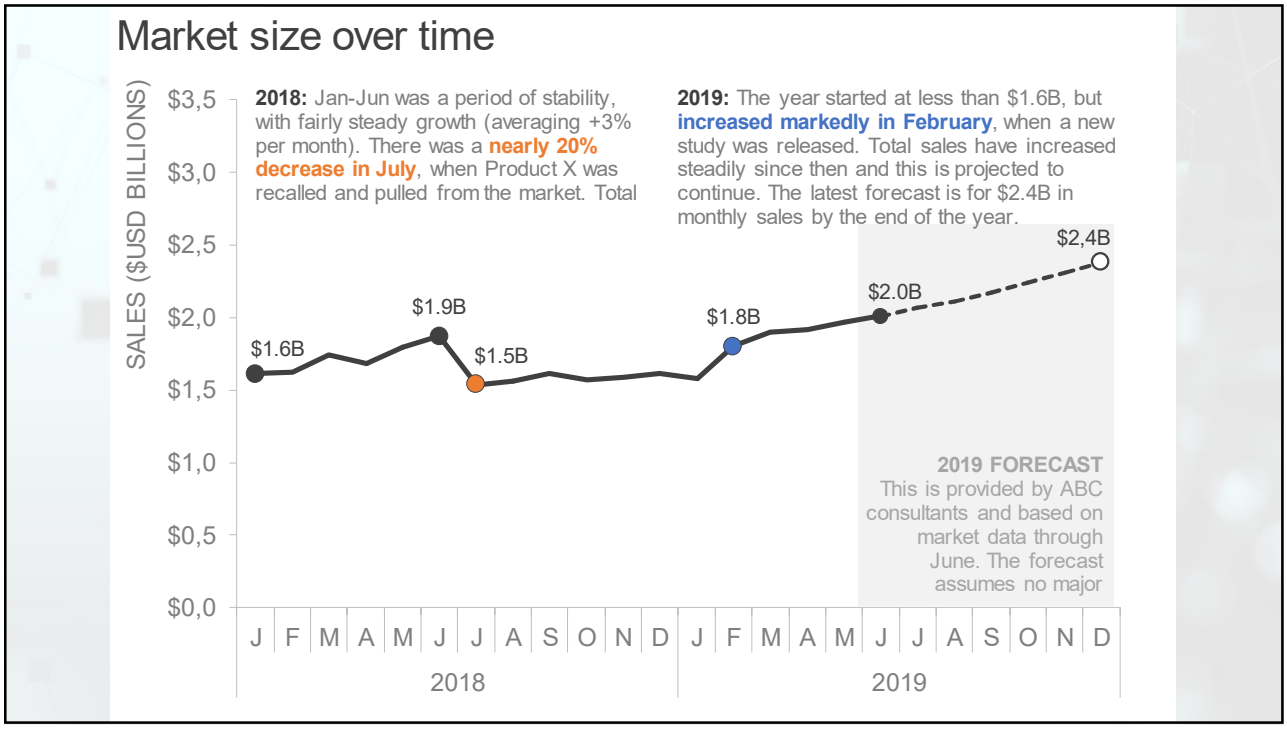
Market size over time
SALES ($USD BILLIONS)
$3,5
$3,0
$2,5
$2,0
$1,5
$1,0
$0,5
$0,0
2018: Jan-Jun was a period of stability, with fairly steady growth (averaging +3% per month). There was a nearly 20% decrease in July, when Product X was recalled and pulled from the market. Total
2019: The year started at less than $1.6B, but increased markedly in February, when a new study was released. Total sales have increased steadily since then and this is projected to continue. The latest forecast is for $2.4B in monthly sales by the end of the year.
$1.6B
$1.9B
$1.5B
$1.8B
$2.0B
$2,4B
2019 FORECAST
This is provided by ABC consultants and based on market data through June. The forecast assumes no major
J F M A M J J A S O N D J F M A M J J A S O N D
2018
2019

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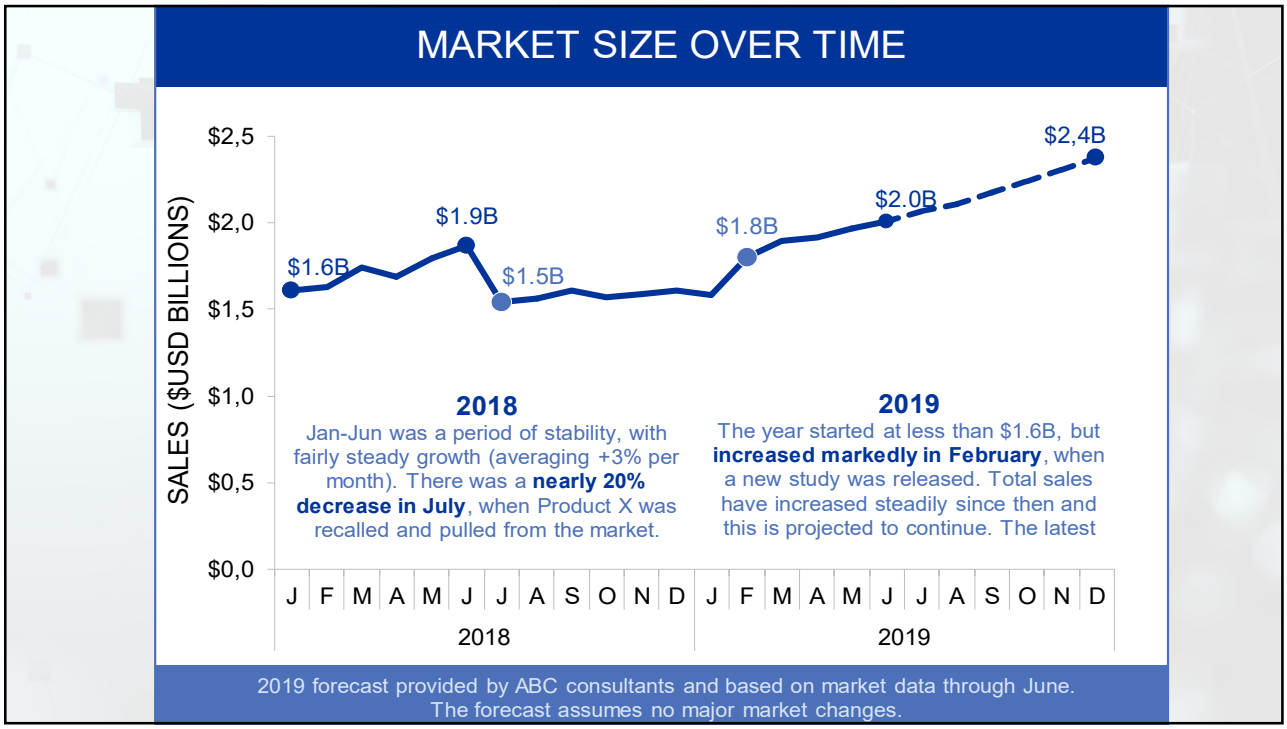
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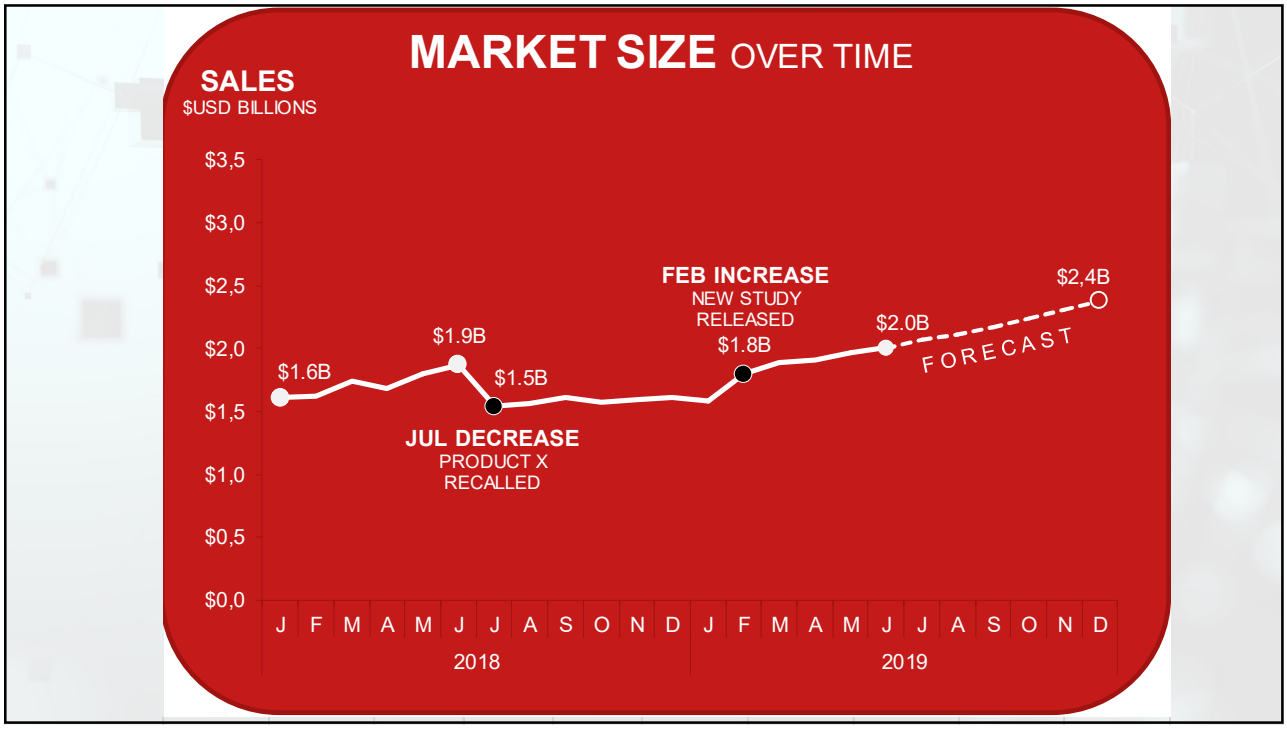
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FEB INCREASE
NEW STUDY RELEASED
JUL DECREASE
PRODUCT X RECALLED
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J F M A M J J A S O N D J F M A M J J A S O N D
2018
2019

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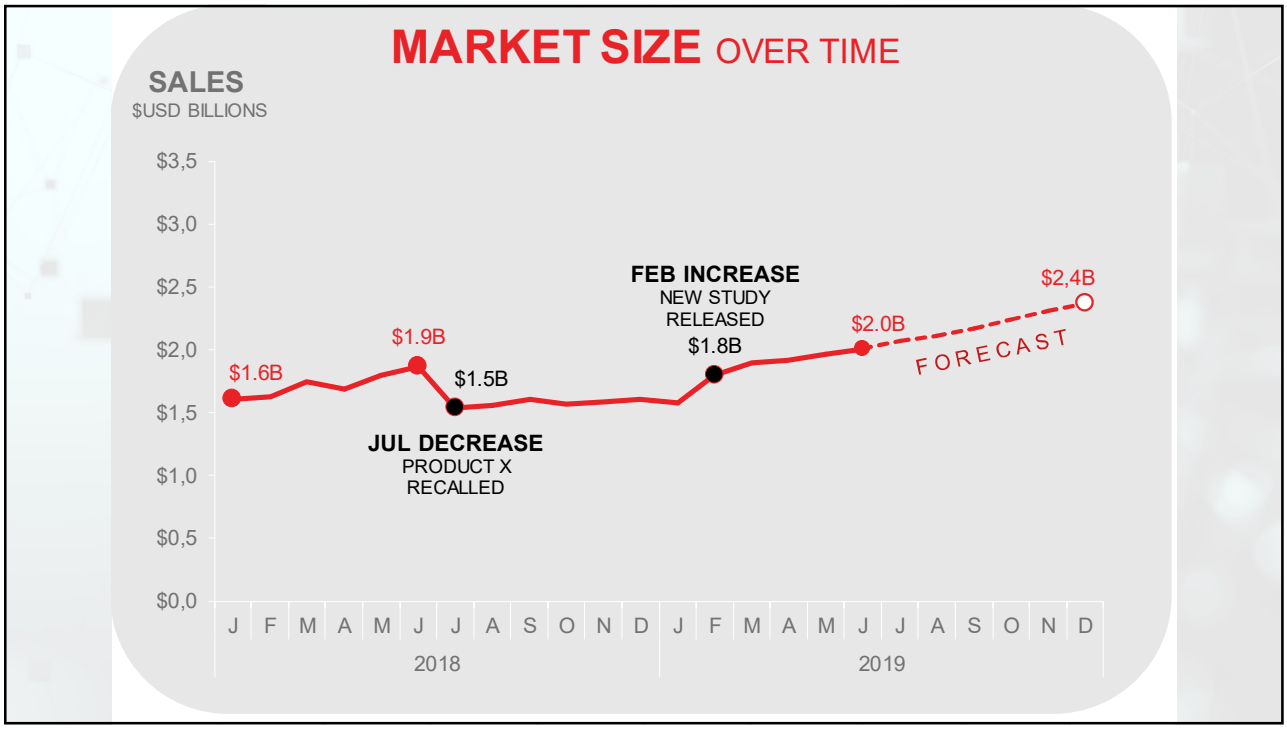

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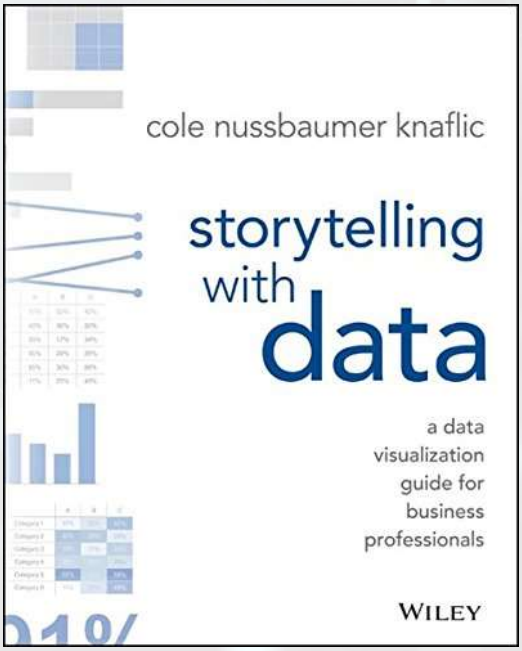
Storytelling with Data

Five steps on Storytelling with Data (Cole Nussbaumer, 2015):

1. Understand the context
2. Choose an effective visual
3. Eliminate clutter
4. Focus attention
5. Tell a story



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CRISP Model of Data Mining (Source: Wikipedia)

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Step 1. Understanding Context & Audience

Route Number	Source	Destination	Container Size	Carrier	Travel Mode	Fixed Freight Cost	Port/Airport/ Rail Handling Cost	Bunker/ Fuel Cost	Documentation Cost	Equipment Cost	Extra Cost	Warehouse Cost	Transit Duty (%)	Overall Costs (Transportation + Warehouse + Goods & Tarriff)	CustomClearance time (hours)	Port/Airport/Rail Handling time (hours)	Extra Time	Transit time (hours)	Monday	Tuesday	Wednesday
1	Singapore Port	Shanghai Port	67	COSCO	Sea	300	300	400	180	20	0		0,002	1200	24	48	0	120	1	0	1
2	Shanghai Port	Singapore Port	67	COSCO	Sea	150	300	400	180	20	0		0,001	1050	24	48	0	120	1	0	1
3	Singapore Port	Malaysia Port	34	COSCO	Sea	50	280	200	150	20	0		0	700	24	48	0	24	0	1	0
4	Malaysia Port	Singapore Port	34	COSCO	Sea	50	280	200	150	20	0		0,001	700	24	48	0	24	0	1	0
5	Shanghai Port	Malaysia Port	67	COSCO	Sea	300	180	400	130	20	0		0	1030	24	48	0	96	0	0	1
6	Malaysia Port	Shanghai Port	67	COSCO	Sea	150	180	400	130	20	0		0,002	880	24	48	0	96	0	0	1
7	Shanghai Port	Wuxi Port	34	COSCO	Sea	100	150	80	100	20	0		0	450	24	48	0	5	1	0	1
8	Wuxi Port	Shanghai Port	34	COSCO	Sea	100	150	80	100	20	0		0	450	24	48	0	5	1	0	1
9	Singapore Airport	Shanghai Airport	7	DHL	Air	900	600	600	180	25	0		0,002	2305	24	8	0	5	1	1	1
10	Shanghai Airport	Singapore Airport	7	DHL	Air	450	600	600	180	25	0		0,001	1855	24	8	0	5	1	1	1
11	Singapore Airport	Malaysia Airport	7	DHL	Air	150	560	400	150	25	0		0	1285	24	8	0	2	1	1	1
12	Malaysia Airport	Singapore Airport	7	DHL	Air	150	560	400	150	25	0		0,001	1285	24	8	0	2	1	1	1
13	Shanghai Airport	Malaysia Airport	7	DHL	Air	900	360	600	130	25	0		0	2015	24	8	0	4,5	1	1	1
14	Malaysia Airport	Shanghai Airport	7	DHL	Air	450	360	600	130	25	0		0,002	1565	24	8	0	4,5	1	1	1
15	Singapore Airport	Wuxi Airport	7	DHL	Air	2000	700	800	200	25	0		0,002	3725	24	8	0	7	1	1	1
16	Wuxi Airport	Singapore Airport	7	DHL	Air	2000	700	800	200	25	0		0,001	3725	24	8	0	7	1	1	1
17	Malaysia Airport	Wuxi Airport	7	DHL	Air	1800	700	800	190	25	0		0,002	3515	24	8	0	6,5	1	1	1
18	Wuxi Airport	Malaysia Airport	7	DHL	Air	1800	700	800	190	25	0		0	3515	24	8	0	6,5	1	1	1
19	Shanghai Railway Station	Wuxi Railway Station	34	Railway A	Rail	80	100	100	50	15	0		0	345	24	24	0	36	1	1	1
20	Wuxi Railway Station	Shanghai Railway Station	34	Railway A	Rail	80	100	100	50	15	0		0	345	24	24	0	36	1	1	1
21	Singapore Railway Station	Malaysia Railway Station	34	Evergreen	Rail	100	500	200	150	30	0		0	980	24	48	0	96	1	1	1
22	Malaysia Railway Station	Singapore Railway Station	34	Evergreen	Rail	100	500	200	150	30	0		0,001	980	24	48	0	96	1	1	1
23	Singapore Warehouse	Singapore Port	34	KTM	Truck	100	0	0	0	0	0	20	0	100	4	0	0	2	1	1	1
24	Singapore Port	Singapore Warehouse	34	KTM	Truck	100	0	0	0	0	0		0	100	4	0	0	2	1	1	1
25	Singapore Warehouse	Singapore Airport	34	KTM	Truck	100	0	0	0	0	0	20	0	100	4	0	0	2	1	1	1
26	Singapore Airport	Singapore Warehouse	34	KTM	Truck	100	0	0	0	0	0		0	100	4	0	0	2	1	1	1
27	Singapore Warehouse	Singapore Railway Station	34	KTM	Truck	100	0	0	0	0	0	20	0	100	4	0	0	2	1	1	1
28	Singapore Railway Station	Singapore Warehouse	34	KTM	Truck	100	0	0	0	0	0		0	100	4	0	0	2	1	1	1
29	Malaysia Warehouse	Malaysia Port	34	KTM	Truck	80	0	0	0	0	0	10	0	80	4	0	0	3	1	1	1
30	Malaysia Port	Malaysia Warehouse	34	KTM	Truck	80	0	0	0	0	0		0	80	4	0	0	3	1	1	1

Route Information | Order Information

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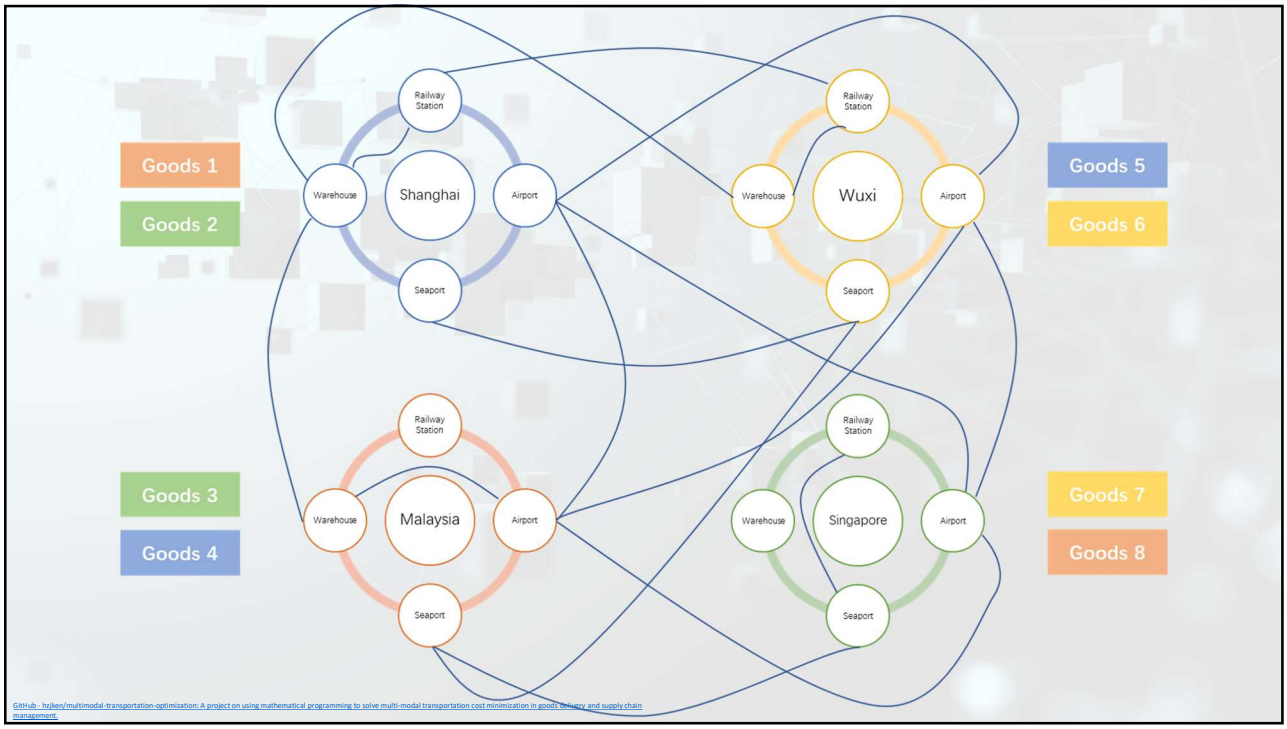

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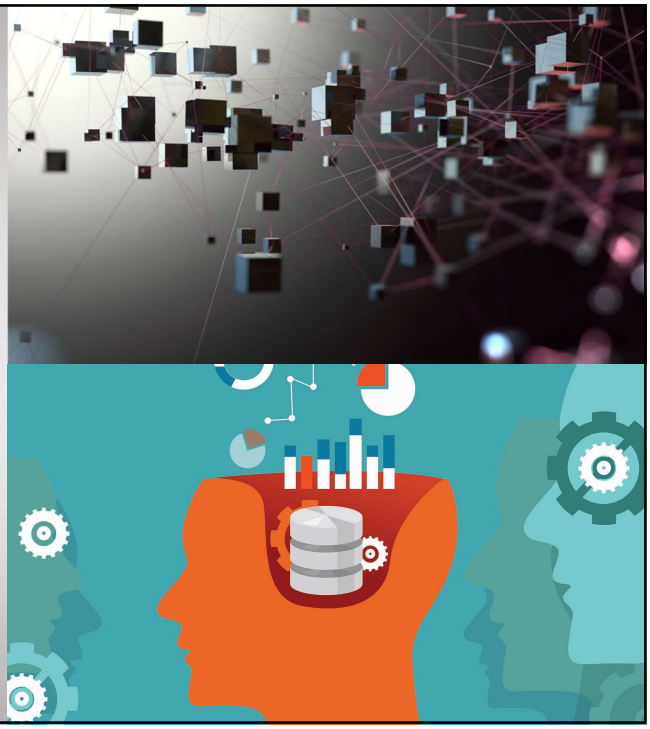
Step 2. Choose an effective visual



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Product returns (%) in a warehouse example

Product returns (in %) by Month and Warehouse									
Month	Warehouse A	Warehouse B	Warehouse C	Warehouse D	Warehouse E	Warehouse F	Warehouse G	Warehouse H	Warehouse I
Jan/20	6.17	3.93	35.55	7.85	0.00	0.00	6.92	25.70	13.28
Feb/20	7.48	26.00	45.82	3.93	7.48	7.29	8.98	32.40	0.00
Mar/20	4.11	8.04	33.47	13.28	0.00	0.00	5.42	51.20	0.00
Apr/20	5.42	5.80	16.46	5.24	15.52	2.43	7.67	19.70	0.00
May/20	0.94	8.79	23.38	8.23	5.98	0.00	8.42	9.20	0.00
Jun/20	11.41	4.30	22.90	16.08	1.40	0.00	8.00	4.30	13.28
Total	**5.80**	**9.40**	**36.40**	**8.98**	**5.00**	**1.50**	**7.48**	**23.90**	**4.49**

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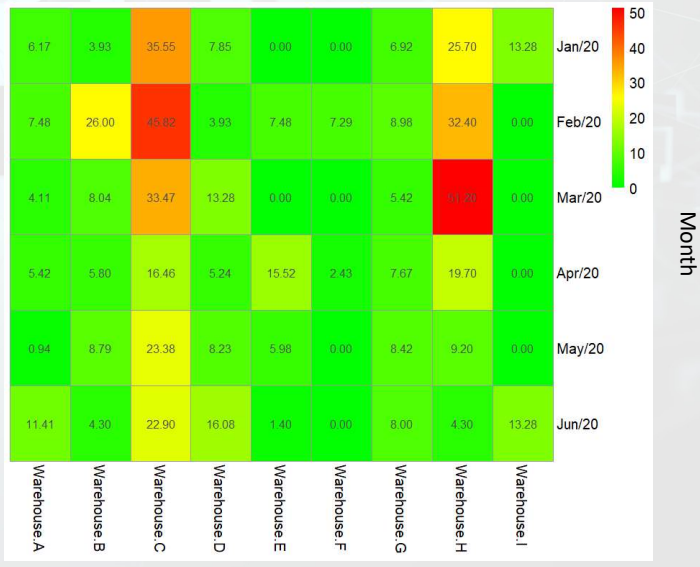
Product returns (%) by month and warehouse



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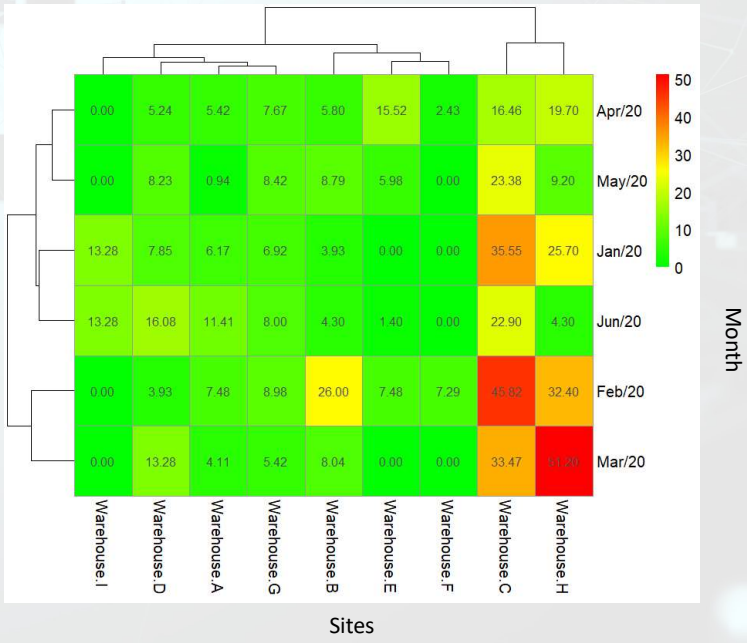
Product returns (%) by month and warehouse



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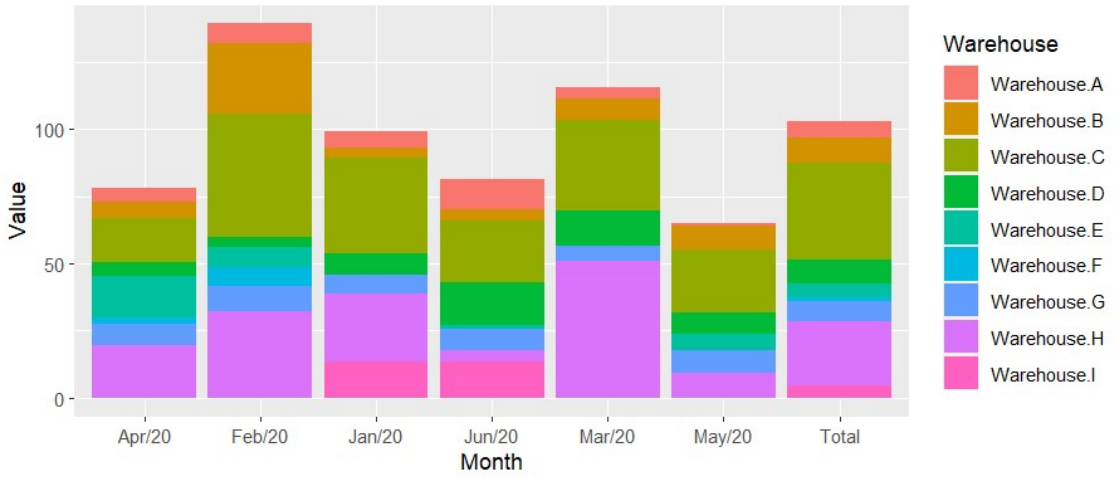
Product returns (%) by month and warehouse



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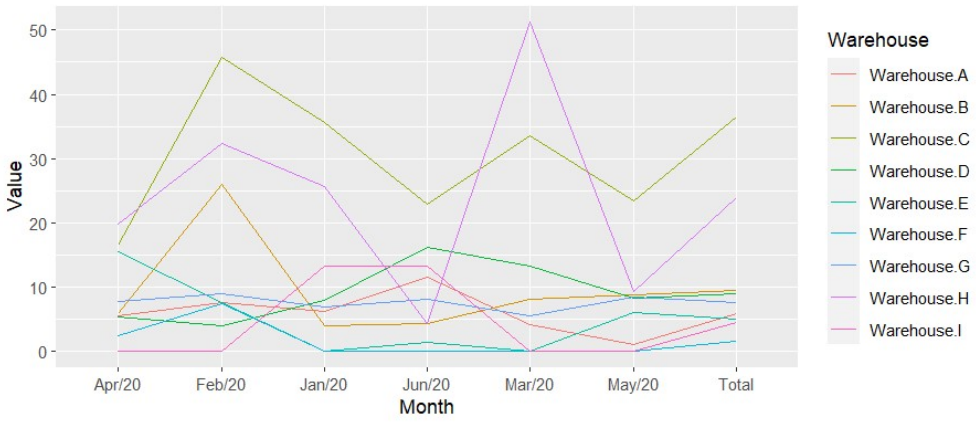

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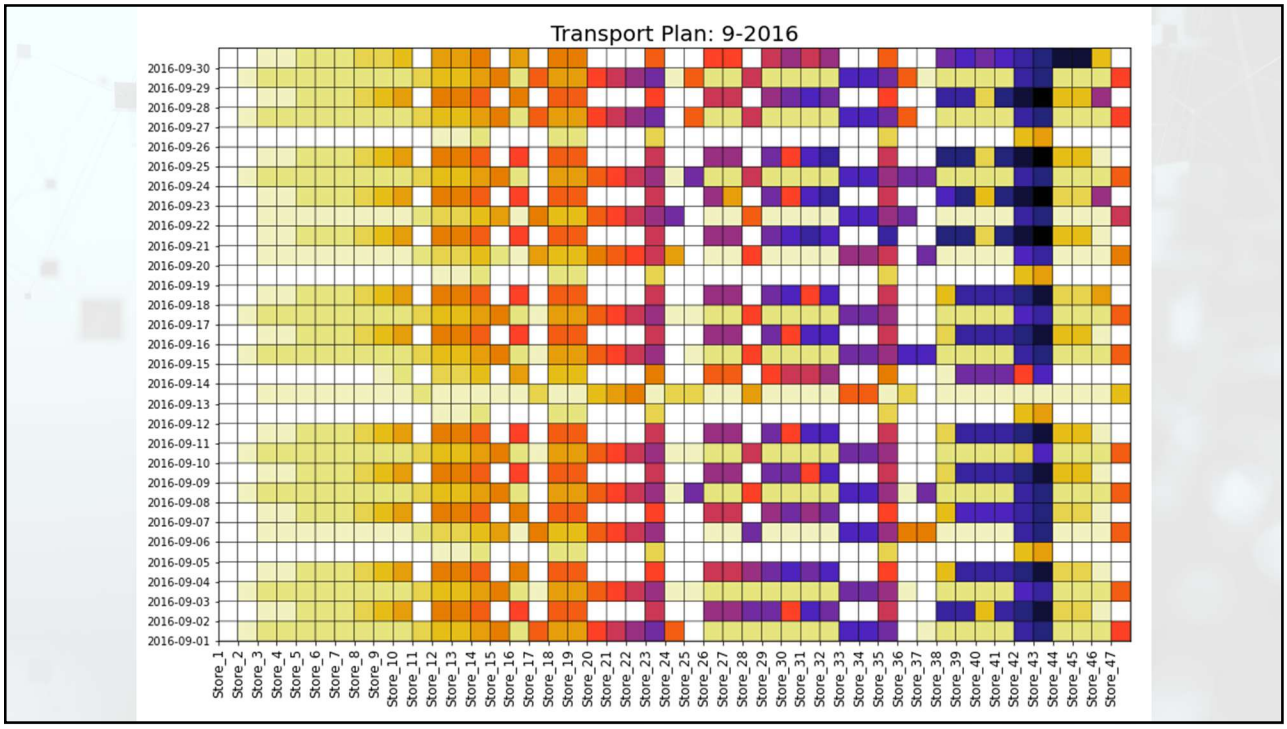

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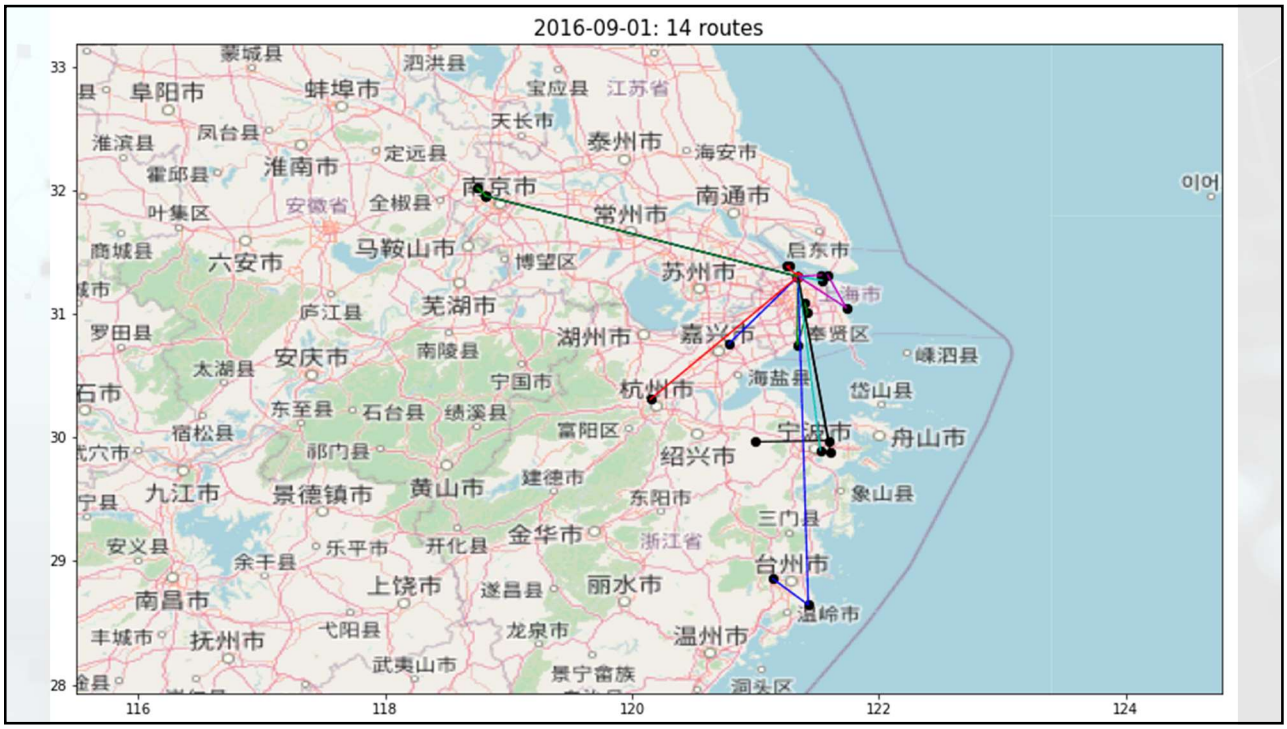

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Steps 3 & 4. Eliminate clutter and Focus attention

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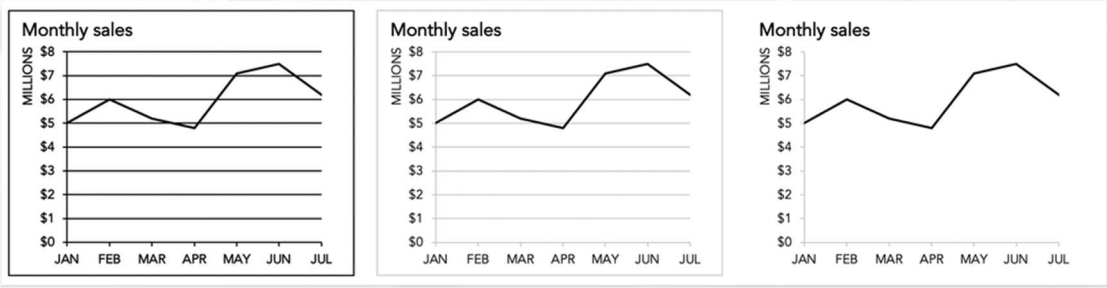
Tip 1: Declutter your graphs to remove distractions



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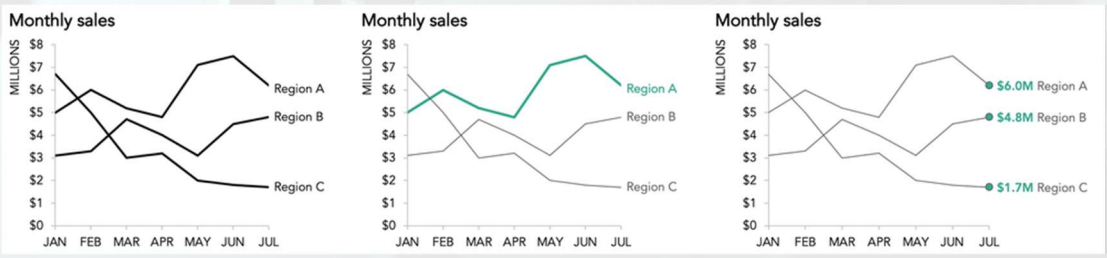
Tip 2: Focus attention so others know where to look



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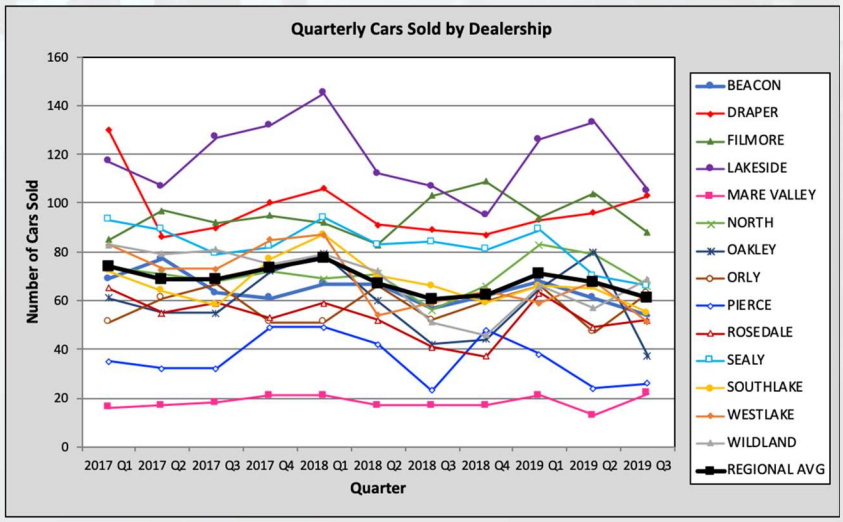

Source: storytelling with data (SWD) examples & makeovers — storytelling with data

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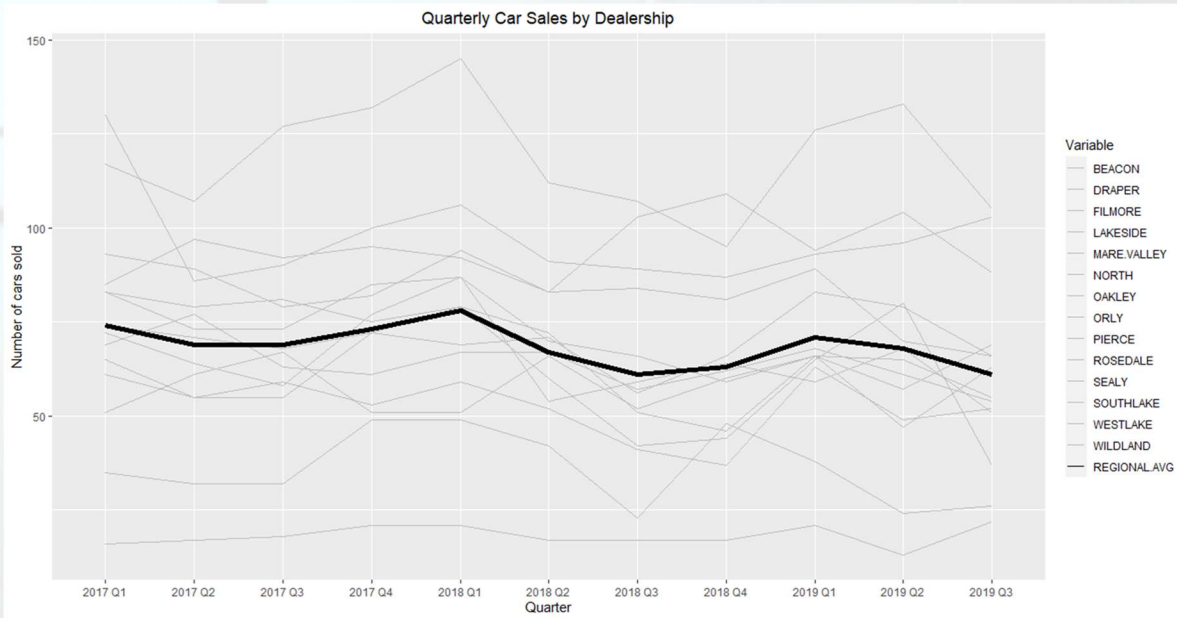

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Step 5. Tell a Story

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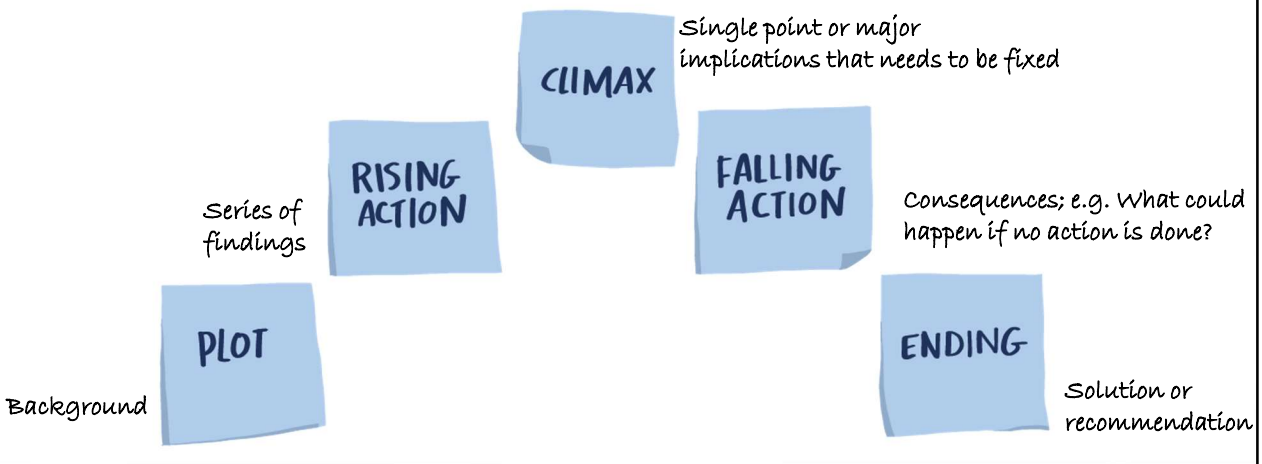
Components of a story



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Let's practice!

Fashion X is losing money because of increasing customer complaints related to order fulfilment of their ordered goods. Your boss ask you to do a research on the order fulfilment performance of the company, the root cause of the problem, and how can the situation be improved.

You were given 3005 data points and the visualization in the next page. Since you took a Storytelling with Data workshop, you want to apply what you have learned. Study the slide in the next page for 2-3 minutes, then tell a story based on the task given to you.

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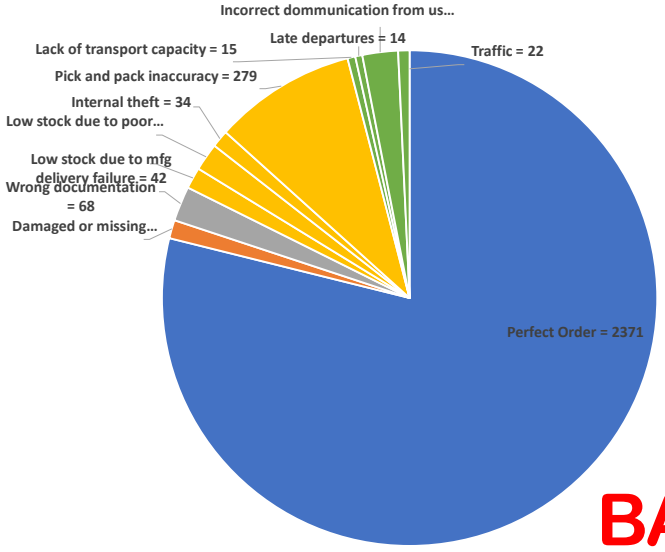

Order Fulfilment Performance Summary (March 2021)	
Perfect order	2371
Imperfect order	634
Total orders	**3005**

Imperfect orders	
Damaged or missing products	36
Late deliveries	121
Incomplete order	409
Wrong documentation	68

BAD GRAPH!!☹

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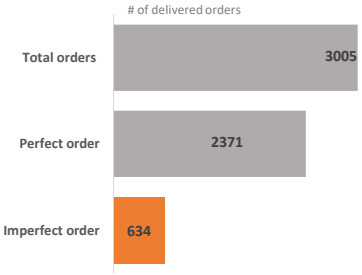
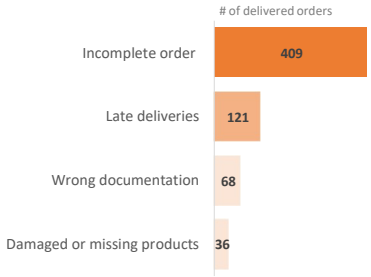
Pick and pack inaccuracies and incorrect communication from us are the top reasons of imperfect orders.

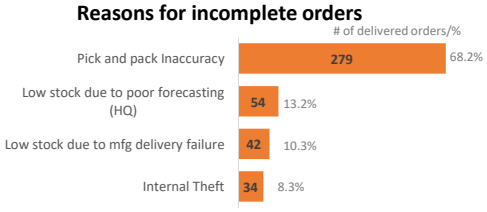
Order fulfilment performance summary
(March 2015)



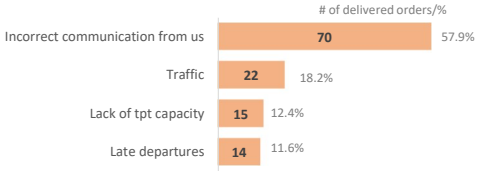
Reasons for imperfect orders



Reasons for incomplete orders



Reasons for Late deliveries



GOOD GRAPH!!! ☺

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Different visualization tools

Visualization tools	Who uses it?	Advantages	Disadvantages
R	• Academics • Engineer • Scientists	• Open source (FREE) • Statistical tool • Best for visualizations	Limited as a general use programming language
Python	• Wide industries	• Open source (FREE) • Many strong libraries for AI and machine learning • Integrate engineering environment	Less good documentation for visualization (it's broader)
Power BI	• Academics • Companies • Students	• Free (Power BI desktop) • Can re-use R and Python code • Easy to use (Excel pivot tables)	• For free version • Unable to handle very huge data (free version) • Power BI Pro - you need to pay
Tableau	• Academics • Companies • Students	• Mobile friendly • Free for a year if you have academic account	• Poor versioning • SQL knowledge • Manual effort

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Summary

- ✓ Storytelling with data is both art and technique for delivering convincing stories.
- ✓ CRISP model of data mining can be followed in alignment with the storytelling with data.
- ✓ Different visualization tools (R, Python, Power BI, Tableau, etc.) can be used by different organizations (SMEs, large companies) depending on the organizational resources, data availability, demands, etc.

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Want to learn more?

For students, companies, lecturers/researchers:

- ✓DAC Network – HAN Lectoraat Logistics and Alliances
- ✓HAN Minor Data Driven Decision Making

- ✓Or contact: frazentolentino@gmail.com for help or collaboration

Website: frazentolentinozondervan.com

FTZ Consulting

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