Analyzing Sales data using Excel and Power BI

Analyzing sales data using Excel and Power BI enables businesses to gain valuable insights into their sales performance, customer behavior, and market trends. Excel provides powerful data analysis tools and functions, while Power BI offers advanced data visualization capabilities, making them a powerful combination for sales analytics. We have been given the task to analyze the sales data from 2020 to 2023 for OfficeHub Innovations, which has been operating for around 25 years. It is assumed that we are performing the analysis in January month of 2024 to share insights regarding sales trends/patterns in the previous periods.

The analysis is divided into two parts:
Part 1 deals with the analysis of data using pivot tables and pivot charts.
Part 2 deals with the creating dashboards using Power BI.

The data used for the analysis has been cleaned beforehand. The data has 51,290 records on different orders about 17 features/dimensions for 4 years (from 2020 to 2023). The features/dimensions are: order_id - ID for orders, order_date - Date of order, ship_mode - Mode of shipping, cust_id - Customer ID, segment - market segment the product is in, state - State of the country order came from, country - Country of the order, market - Global market area, region - Geographic region, product_id - Product ID, category - Category of the product, sub_category - Sub-category of the product, sales - Revenue from sales, quantity - Order quantity, discount - Discount rate, profit - Total profit from sale, order_priority - Priority of order for faster delivey time.

Original Dataset

order_id	order_date	ship_mode	cust_id	segment	state	country	market	region	product_id	category	sub_category	sales	quantity	discount	profit	order_priority
AG-2011-2	1/1/2020	Standard Cla	100051	Consumer	Constantin	Algeria	Africa	Africa	OFF-TEN-100	Office Sup	Storage	408	2	0	106.14	Medium
IN-2011-47	1/1/2020	Standard Cla	100052	Consumer	New South	Australia	APAC	Oceania	OFF-SU-1000	Office Sup	Supplies	120	3	0.1	36.036	Medium
HU-2011-1	1/1/2020	Second Class	100053	Consumer	Budapest	Hungary	EMEA	EMEA	OFF-TEN-100	Office Sup	Storage	66	4	0	29.64	High
IT-2011-36	1/1/2020	Second Class	100054	Home Offic	Stockholm	Sweden	EU	North	OFF-PA-1000	Office Sup	Paper	45	3	0.5	-26.055	High
IN-2011-47	1/1/2020	Standard Cla	100052	Consumer	New South	Australia	APAC	Oceania	FUR-FU-1000	Furniture	Furnishings	114	5	0.1	37.77	Medium
IN-2011-47	1/1/2020	Standard Cla	100052	Consumer	New South	Australia	APAC	Oceania	OFF-PA-1000	Office Sup	Paper	55	2	0.1	15.342	Medium
CA-2011-1!	1/2/2020	Standard Cla	100055	Consumer	Ontario	Canada	Canada	Canada	TEC-OKI-100	Technolog	Machines	314	1	0	3.12	Medium
IN-2011-79	1/3/2020	Same Day	100056	Corporate	New South	Australia	APAC	Oceania	OFF-AP-1000	Office Sup	Appliances	276	1	0.1	110.412	Critical
ID-2011-80	1/3/2020	Standard Cla	100057	Consumer	Auckland	New Zeala	APAC	Oceania	TEC-CO-1000	Technolog	Copiers	912	4	0.4	-319.464	Low
IZ-2011-46	1/3/2020	Standard Cla	100058	Corporate	Ninawa	Iraq	EMEA	EMEA	FUR-NOV-10	Furniture	Chairs	667	4	0	253.32	High
IN-2011-65	1/3/2020	Second Class	100059	Consumer	National C	Philippines	APAC	Southeast	OFF-ST-1000	Office Sup	Storage	338	3	0.45	-122.801	High
IN-2011-65	1/3/2020	Second Class	100059	Consumer	National C	Philippines	APAC	Southeast	FUR-TA-1000	Furniture	Tables	211	1	0.55	-70.3995	High
ES-2011-48	1/3/2020	Standard Cla	100060	Consumer	England	United Kin	EU	North	FUR-BO-1000	Furniture	Bookcases	854	7	0	290.43	Medium
IN-2011-33	1/3/2020	Standard Cla	100061	Home Offic	Sarawak	Malaysia	APAC	Southeast	TEC-CO-1000	Technolog	Copiers	193	1	0	50.13	Medium
ID-2011-80	1/3/2020	Standard Cla	100057	Consumer	Auckland	New Zeala	APAC	Oceania	FUR-CH-1000	Furniture	Chairs	159	2	0.4	-95.676	Low
MX-2011-1	1/3/2020	Standard Cla	100062	Consumer	Guatemala	Guatemala	LATAM	Central	TEC-PH-1000	Technolog	Phones	195	4	0	44.88	Medium
IR-2011-77	1/3/2020	Standard Cla	100063	Consumer	Yazd	Iran	EMEA	EMEA	OFF-BRE-100	Office Sup	Appliances	123	2	0	42.9	Medium
ID-2011-80	1/3/2020	Standard Cla	100057	Consumer	Auckland	New Zeala	APAC	Oceania	TEC-AC-1000	Technolog	Accessories	69	2	0.4	3.42	Low
ID-2011-80	1/3/2020	Standard Cla	100057	Consumer	Auckland	New Zeala	APAC	Oceania	FUR-CH-1000	Furniture	Chairs	69	2	0.4	-26.412	Low
ID-2011-12	1/3/2020	Standard Cla	100064	Consumer	Nakhon Ra	Thailand	APAC	Southeast	OFF-ST-1000	Office Sup	Storage	135	2	0.47	-45.9018	Medium
IN-2011-79	1/3/2020	Same Day	100056	Corporate	New South	Australia	APAC	Oceania	OFF-LA-1000	Office Sup	Labels	36	3	0.1	4.743	Critical
IR-2011-76	1/3/2020	Second Class	100065	Corporate	Razavi Kho	Iran	EMEA	EMEA	OFF-BIC-1000	Office Sup	Art	52	1	0	7.77	High
IR-2011-77	1/3/2020	Standard Cla	100063	Consumer	Yazd	Iran	EMEA	EMEA	OFF-ROG-10	Office Sup	Storage	62	2	0	8.7	Medium
TZ-2011-73	1/3/2020	Standard Cla	100066	Consumer	Dar Es Sala	Tanzania	Africa	Africa	OFF-STI-1000	Office Sup	Supplies	81	4	0	26.76	Medium
IZ-2011-46	1/3/2020	Standard Cla	100058	Corporate	Ninawa	Iraq	EMEA	EMEA	OFF-CAM-10	Office Sup	Envelopes	47	1	0	17.07	High
IN-2011-65	1/3/2020	Second Class	100059	Consumer	National C	Philippines	APAC	Southeast	OFF-FA-1000	Office Sup	Fasteners	6	1	0.45	0.546	High
IR-2011-77	1/3/2020	Standard Cla	100063	Consumer	Yazd	Iran	EMEA	EMEA	OFF-ADV-100	Office Sup	Fasteners	17	1	0	4.17	Medium
MX-2011-1	1/4/2020	Second Class	100067	Consumer	Parana	Brazil	LATAM	South	FUR-BO-1000	Furniture	Bookcases	1648	6	0	609.84	Medium
MX-2011-1	1/4/2020	Standard Cla	100068	Corporate	Yucatân	Mexico	LATAM	North	TEC-AC-1000	Technolog	Accessories	223	4	0	13.28	High
MX-2011-1	1/4/2020	Home Offic	100069	Home Offic	Granma	Cuba	LATAM	Caribbean	OFF-EN-1000	Office Sup	Envelopes	186	6	0	3.6	Medium
ES-2011-49	1/4/2020	Standard Cla	100070	Consumer	Rhône-Alp	France	EU	Central	OFF-AR-1000	Office Sup	Art	140	3	0	20.88	Medium
MX-2011-1	1/4/2020	Second Class	100067	Consumer	Parana	Brazil	LATAM	South	OFF-SU-1000	Office Sup	Supplies	149	8	0	28.16	Medium
MX-2011-1	1/4/2020	Standard Cla	100068	Corporate	Yucatân	Mexico	LATAM	North	TEC-CO-1000	Technolog	Copiers	166	2	0.002	49.42824	High

PART I:
# Data Analysis using Pivot Tables and Pivot Charts in Excel

Yearly Sales Trends

Year	Total Revenue
2020	$ 2,212,149
2021	$ 2,724,855
2022	$ 3,405,860
2023	$ 4,300,041
Grand Total	$ 12,642,905

Year	Revenue Growth
2020	
2021	23.18%
2022	24.99%
2023	26.25%
Grand Total	
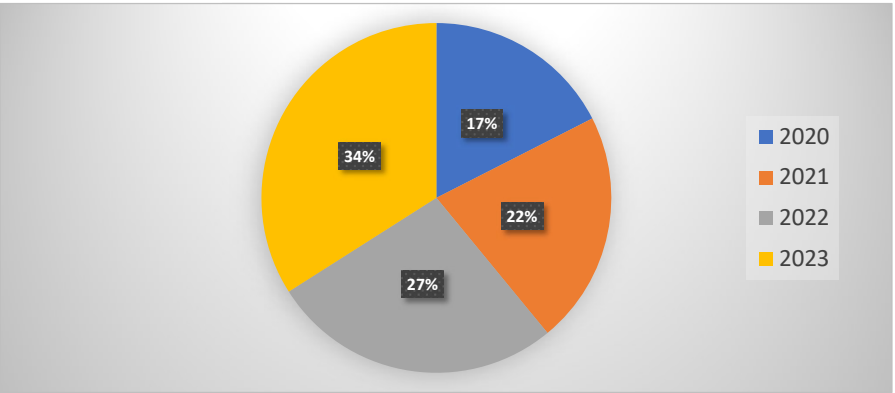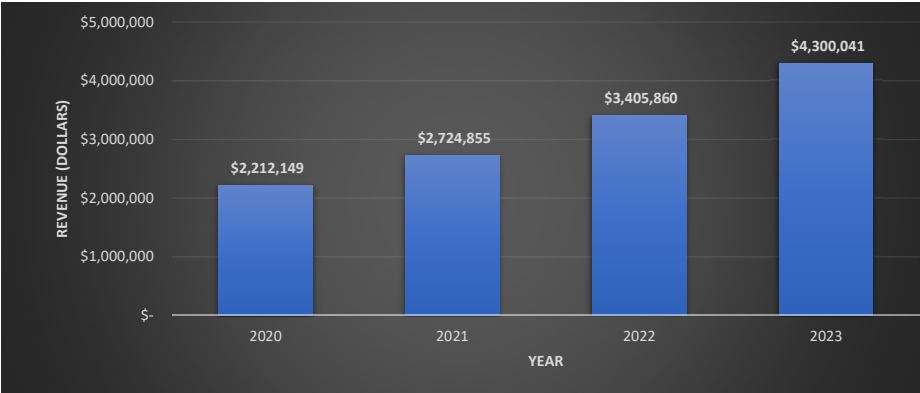
Quarterly Sales Trends

Years	Quarters	Total Revenue	Revenue Percent	Quarterly Growth
2020				
	Qtr1	$ 290,938	13.15%	
	Qtr2	$ 480,161	21.71%	65.04%
	Qtr3	$ 611,099	27.62%	27.27%
	Qtr4	$ 829,951	37.52%	35.81%
2020 Total		**$ 2,212,149**	**100.00%**	
2021				
	Qtr1	$ 417,985	15.34%	
	Qtr2	$ 642,251	23.57%	53.65%
	Qtr3	$ 749,920	27.52%	16.76%
	Qtr4	$ 914,699	33.57%	21.97%
2021 Total		**$ 2,724,855**	**100.00%**	
2022				
	Qtr1	$ 565,035	16.59%	
	Qtr2	$ 834,873	24.51%	47.76%
	Qtr3	$ 933,057	27.40%	11.76%
	Qtr4	$ 1,072,895	31.50%	14.99%
2022 Total		**$ 3,405,860**	**100.00%**	
2023				
	Qtr1	$ 689,225	16.03%	
	Qtr2	$ 933,028	21.70%	35.37%
	Qtr3	$ 1,173,480	27.29%	25.77%
	Qtr4	$ 1,504,308	34.98%	28.19%
2023 Total		**$ 4,300,041**	**100.00%**	
Grand Total		**$ 12,642,905**		
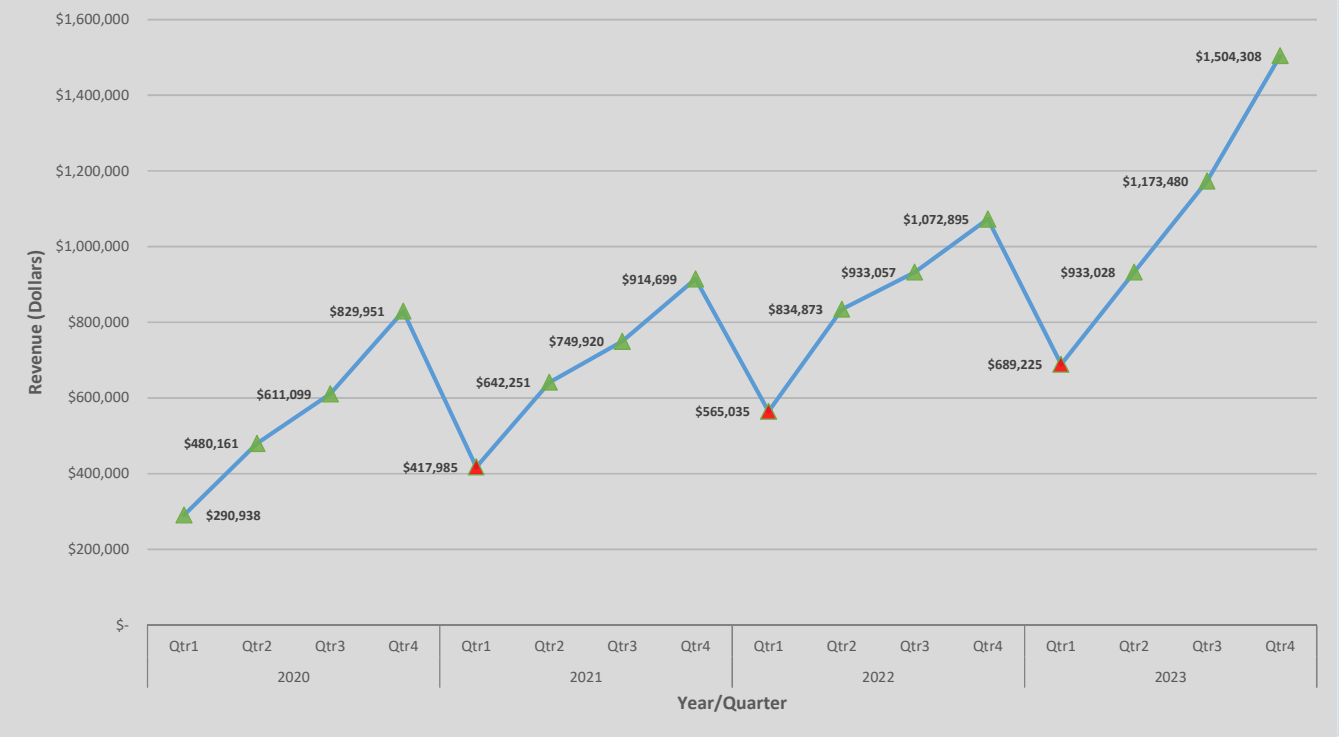
Monthly Sales Trends

Month	Total Revenue
Jan	$ 634,250
Feb	$ 559,753
Mar	$ 769,180
Apr	$ 704,331
May	$ 920,206
Jun	$ 1,265,776
Jul	$ 756,535
Aug	$ 1,302,273
Sep	$ 1,408,748
Oct	$ 1,185,263
Nov	$ 1,546,769
Dec	$ 1,589,821
Grand Total	$ 12,642,905

Monthly Sales Trends bar chart — Revenue (Dollars) by Month:
Jan $634,250; Feb $559,753; Mar $769,180; Apr $704,331; May $920,206; Jun $1,265,776; Jul $756,535; Aug $1,302,273; Sep $1,408,748; Oct $1,185,263; Nov $1,546,769; Dec $1,589,821
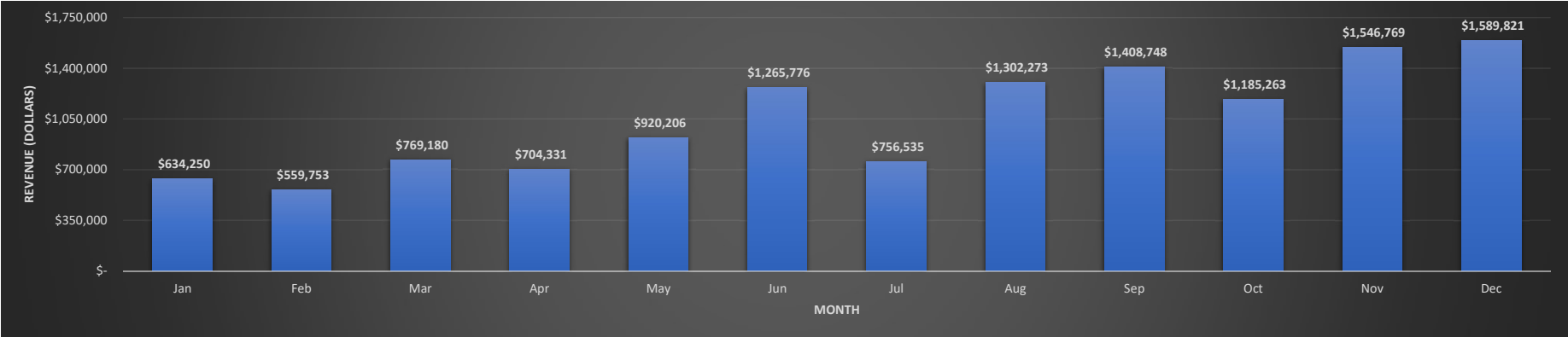
Orders by Sub-category and Category

Month	Total Orders	Orders Share
Furniture	**9,876**	**19.26%**
Chairs	3,434	6.70%
Furnishi	3,170	6.18%
Bookcas	2,411	4.70%
Tables	861	1.68%
Office Supp	**31,273**	**60.97%**
Binders	6,152	11.99%
Storage	5,059	9.86%
Art	4,883	9.52%
Paper	3,538	6.90%
Labels	2,606	5.08%
Envelop	2,435	4.75%
Supplies	2,425	4.73%
Fastener	2,420	4.72%
Applianc	1,755	3.42%
Technology	**10,141**	**19.77%**
Phones	3,357	6.55%
Accessor	3,075	6.00%
Copiers	2,223	4.33%
Machine	1,486	2.90%
Grand Total	**51,290**	**100.00%**

Orders by Sub-category and Category bar chart — Total Orders:
Technology: Machines 1,486; Copiers 2,223; Accessories 3,075; Phones 3,357
Office Supplies: Appliances 1,755; Fasteners 2,420; Supplies 2,425; Envelopes 2,435; Labels 2,606; Paper 3,538; Art 4,883; Storage 5,059; Binders 6,152
Furniture: Tables 861; Bookcases 2,411; Furnishings 3,170; Chairs 3,434

Revenue by Sub-category and Region

Sub-Category	Total Revenue	Percent Revenue
Phones	$ 798,744	12.88%
Copiers	$ 770,957	12.43%
Chairs	$ 689,260	11.12%
Bookcases	$ 660,561	10.65%
Storage	$ 603,961	9.74%
Appliances	$ 493,669	7.96%
Accessories	$ 391,915	6.32%
Machines	$ 378,367	6.10%
Tables	$ 355,826	5.74%
Binders	$ 255,394	4.12%
Art	$ 198,410	3.20%
Furnishings	$ 195,549	3.15%
Paper	$ 125,410	2.02%
Supplies	$ 124,426	2.01%
Envelopes	$ 83,843	1.35%
Fasteners	$ 39,111	0.63%
Labels	$ 35,376	0.57%
Grand Total	**$ 6,200,779**	**100.00%**

Select Year

2022 - 2023   YEARS ▾

2020   2021   2022   2023   2024

Select Region

| Africa | Canada | Caribbean | Central | Central Asia | East | EMEA |
| North | North Asia | Oceania | South | Southeast Asia | West | |

Bar chart — REVENUE (DOLLARS) by SUB-CATEGORY:
Phones $798,744; Copiers $770,957; Chairs $689,260; Bookcases $660,561; Storage $603,961; Appliances $493,669; Accessories $391,915; Machines $378,367; Tables $355,826; Binders $255,394; Art $198,410; Furnishings $195,549; Paper $125,410; Supplies $124,426; Envelopes $83,843; Fasteners $39,111; Labels $35,376
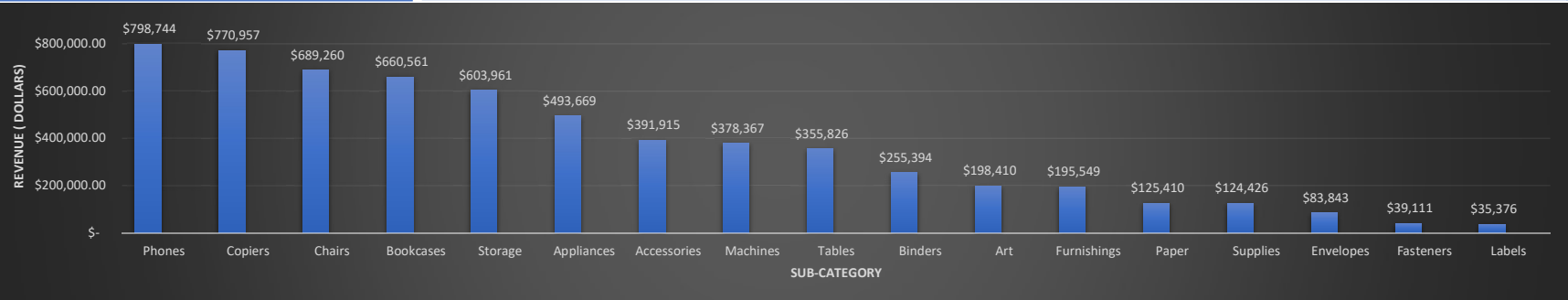
Revenue Growth for Top Subcategory Items By Market

Market	Appliances Revenue	Revenue Growth	Bookcases Revenue	Revenue Growth	Chairs Revenue	Revenue Growth	Copiers Revenue	Revenue Growth	Phones Revenue	Revenue Growth	Storage Revenue	Revenue Growth	Total Revenue	Total Revenue Growth
US	$ 92,535		$ 95,227		$ 252,283		$ 138,680		$ 253,819		$ 174,388		$ 1,006,932	
2021	$ 23,556		$ 38,922		$ 72,809		$ 26,180		$ 69,489		$ 45,913		$ 276,869	
2022	$ 26,053	10.60%	$ 26,279	-32.48%	$ 83,919	15.26%	$ 49,600	89.46%	$ 78,672	13.22%	$ 58,637	27.71%	$ 323,160	16.72%
2023	$ 42,926	64.76%	$ 30,026	14.26%	$ 95,555	13.87%	$ 62,900	26.81%	$ 105,658	34.30%	$ 69,838	19.10%	$ 406,903	25.91%
LATAM	$ 145,226		$ 249,826		$ 249,116		$ 262,934		$ 233,964		$ 117,209		$ 1,258,275	
2021	$ 40,863		$ 65,078		$ 62,026		$ 72,353		$ 63,355		$ 27,595		$ 331,270	
2022	$ 47,100	15.26%	$ 85,646	31.61%	$ 90,781	46.36%	$ 86,189	19.12%	$ 77,085	21.67%	$ 45,712	65.65%	$ 432,513	30.56%
2023	$ 57,263	21.58%	$ 99,102	15.71%	$ 96,309	6.09%	$ 104,392	21.12%	$ 93,524	21.33%	$ 43,902	-3.96%	$ 494,492	14.33%
EU	$ 227,962		$ 299,765		$ 181,810		$ 320,995		$ 297,055		$ 282,379		$ 1,609,966	
2021	$ 56,805		$ 83,553		$ 50,371		$ 82,143		$ 84,056		$ 73,753		$ 430,681	
2022	$ 81,529	43.52%	$ 82,225	-1.59%	$ 63,134	25.34%	$ 96,514	17.50%	$ 84,547	0.58%	$ 82,020	11.21%	$ 489,969	13.77%
2023	$ 89,628	9.93%	$ 133,987	62.95%	$ 68,305	8.19%	$ 142,338	47.48%	$ 128,452	51.93%	$ 126,606	54.36%	$ 689,316	40.69%
EMEA	$ 62,403		$ 73,321		$ 59,929		$ 71,014		$ 92,951		$ 85,038		$ 444,656	
2021	$ 18,180		$ 17,238		$ 15,505		$ 15,786		$ 20,276		$ 18,524		$ 105,509	
2022	$ 22,096	21.54%	$ 19,454	12.86%	$ 14,153	-8.72%	$ 21,761	37.85%	$ 31,615	55.92%	$ 28,309	52.82%	$ 137,388	30.21%
2023	$ 22,127	0.14%	$ 36,629	88.29%	$ 30,271	113.88%	$ 33,467	53.79%	$ 41,060	29.88%	$ 38,205	34.96%	$ 201,759	46.85%
Canada	$ 6,483		$ 5,734		$ 2,786		$ 6,499		$ 9,455		$ 9,197		$ 40,154	
2021	$ 3,968		$ 658		$ 460		$ 2,091		$ 1,373		$ 3,373		$ 11,923	
2022	$ 1,646	-58.52%	$ 1,310	99.09%	$ 534	16.09%	$ 4,408	110.81%	$ 1,595	16.17%	$ 2,650	-21.43%	$ 12,143	1.85%
2023	$ 869	-47.21%	$ 3,766	187.48%	$ 1,792	235.58%	$ -	#NULL!	$ 6,487	306.71%	$ 3,174	19.77%	$ 16,088	32.49%
APAC	$ 250,371		$ 414,898		$ 430,070		$ 412,080		$ 391,592		$ 179,271		$ 2,078,282	
2021	$ 67,197		$ 97,709		$ 95,167		$ 110,694		$ 108,806		$ 47,592		$ 527,165	
2022	$ 62,599	-6.84%	$ 135,186	38.36%	$ 152,390	60.13%	$ 131,957	19.21%	$ 148,017	36.04%	$ 61,587	29.41%	$ 691,736	31.22%

Year/Region													
2023	$ 120,575	92.61%	$ 182,003	34.63%	$ 182,513	19.77%	$ 169,429	28.40%	$ 134,769	-8.95%	$ 70,092	13.81%	$ 859,381	24.24%
Africa	$ 54,605		$ 73,425		$ 45,535		$ 85,082		$ 96,475		$ 79,910		$ 435,032	
2021	$ 14,270		$ 19,817		$ 4,289		$ 22,145		$ 22,414		$ 17,707		$ 100,642	
2022	$ 13,932	-2.37%	$ 25,937	30.88%	$ 22,611	427.19%	$ 25,081	13.26%	$ 31,998	42.76%	$ 30,577	72.68%	$ 150,136	49.18%
2023	$ 26,403	89.51%	$ 27,671	6.69%	$ 18,635	-17.58%	$ 37,856	50.93%	$ 42,063	31.46%	$ 31,626	3.43%	$ 184,254	22.72%
Grand Total	$ 839,585		$ 1,212,196		$ 1,221,529		$ 1,297,284		$ 1,375,311		$ 927,392		$ 6,873,297	

Revenue by Category, Country and Year/Quarter

Select Year

2022 - 2023   YEARS ▾

2020   2021   2022   2023   2024

Select Country

Albania	Algeria	Angola	Argentina	Armenia	Australia	Austria	Azerbaijan
Bahrain	Barbados	Belarus	Belgium	Benin	Bolivia	Bosnia and Herzegov...	Brazil
Bulgaria	Cameroon	Canada	Central African Repu...	Chad	Chile	Colombia	Cote d'Ivoire
Croatia	Cuba	Czech Republic	Democratic Republic ...	Denmark	Djibouti	Dominican Republic	Ecuador

Category	Total Revenue
Furniture	**$ 1,525,500**
Qtr1	$ 243,282
Qtr2	$ 334,567
Qtr3	$ 421,614
Qtr4	$ 526,037
Office Sup	**$ 1,672,015**
Qtr1	$ 290,410
Qtr2	$ 387,954
Qtr3	$ 458,490
Qtr4	$ 535,161
Technolog	**$ 1,963,674**
Qtr1	$ 301,048
Qtr2	$ 442,577
Qtr3	$ 535,606
Qtr4	$ 684,443
Grand Total	**$ 5,161,189**

Bar chart — REVENUE by CATEGORY/QUARTER:

Furniture: Qtr1 $243,282; Qtr2 $334,567; Qtr3 $421,614; Qtr4 $526,037
Office Supplies: Qtr1 $290,410; Qtr2 $387,954; Qtr3 $458,490; Qtr4 $535,161
Technology: Qtr1 $301,048; Qtr2 $442,577; Qtr3 $535,606; Qtr4 $684,443

Revenue Breakdown by Geography

Select Year

2022 - 2023   YEARS ▾

2020   2021   2022   2023   2024

Market	Revenue	Sum of sales
APAC	$ 2,183,828	28.34%
EU	$ 1,803,910	23.41%
US	$ 1,342,539	17.42%
LATAM	$ 1,314,839	17.06%
Africa	$ 512,103	6.65%
EMEA	$ 506,356	6.57%
Canada	$ 42,326	0.55%
Grand Total	**$ 7,705,901**	**100.00%**

Bar chart — Global Market Revenue (Dollars):

Canada $42,326; EMEA $506,356; Africa $512,103; LATAM $1,314,839; US $1,342,539; EU $1,803,910; APAC $2,183,828

Pie chart:

APAC 28%; EU 23%; US 17%; LATAM 17%; Africa 7%; EMEA 7%; Canada 1%
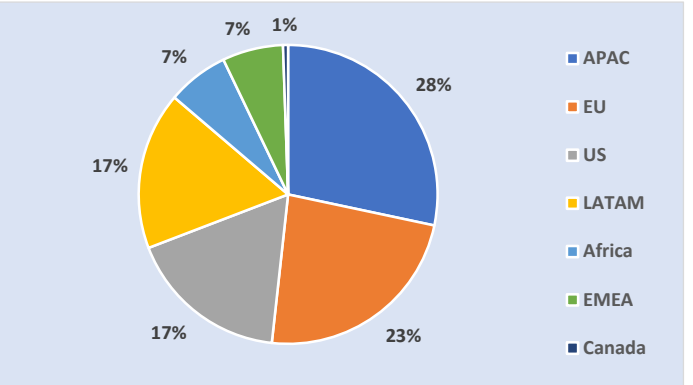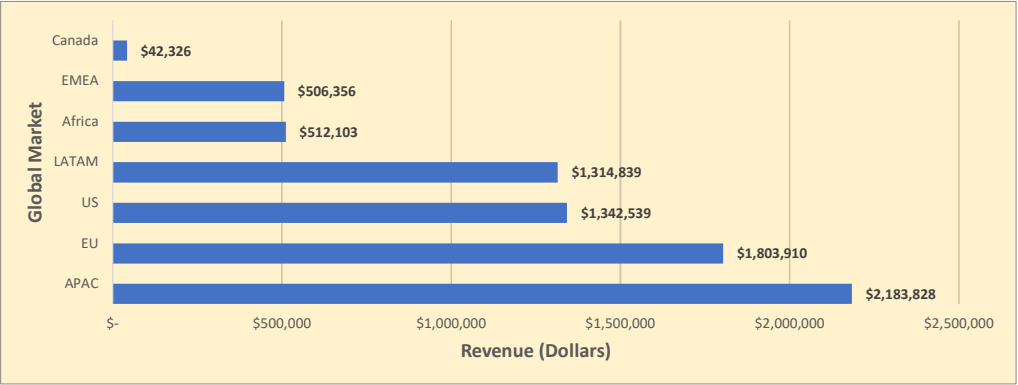
Market	Revenue	Revenue Growth
US	**$ 2,297,354**	
2020	$ 478,709	
2021	$ 476,106	-0.54%
2022	$ 608,523	27.81%
2023	$ 734,016	20.62%
LATAM	**$ 2,164,687**	
2020	$ 374,313	
2021	$ 475,535	27.04%
2022	$ 608,148	27.89%
2023	$ 706,691	16.20%
EU	**$ 2,938,139**	
2020	$ 469,185	
2021	$ 665,044	41.74%
2022	$ 761,686	14.53%
2023	$ 1,042,224	36.83%
EMEA	**$ 806,184**	
2020	$ 130,254	
2021	$ 169,574	30.19%
2022	$ 204,654	20.69%
2023	$ 301,702	47.42%
Canada	**$ 66,932**	
2020	$ 8,491	
2021	$ 16,115	89.79%
2022	$ 19,162	18.91%
2023	$ 23,164	20.89%
APAC	**$ 3,585,833**	
2020	$ 628,810	
2021	$ 773,195	22.96%
2022	$ 974,618	26.05%
2023	$ 1,209,210	24.07%
Africa	**$ 783,776**	
2020	$ 122,387	
2021	$ 149,286	21.98%
2022	$ 229,069	53.44%
2023	$ 283,034	23.56%
Grand Total	**$ 12,642,905**	
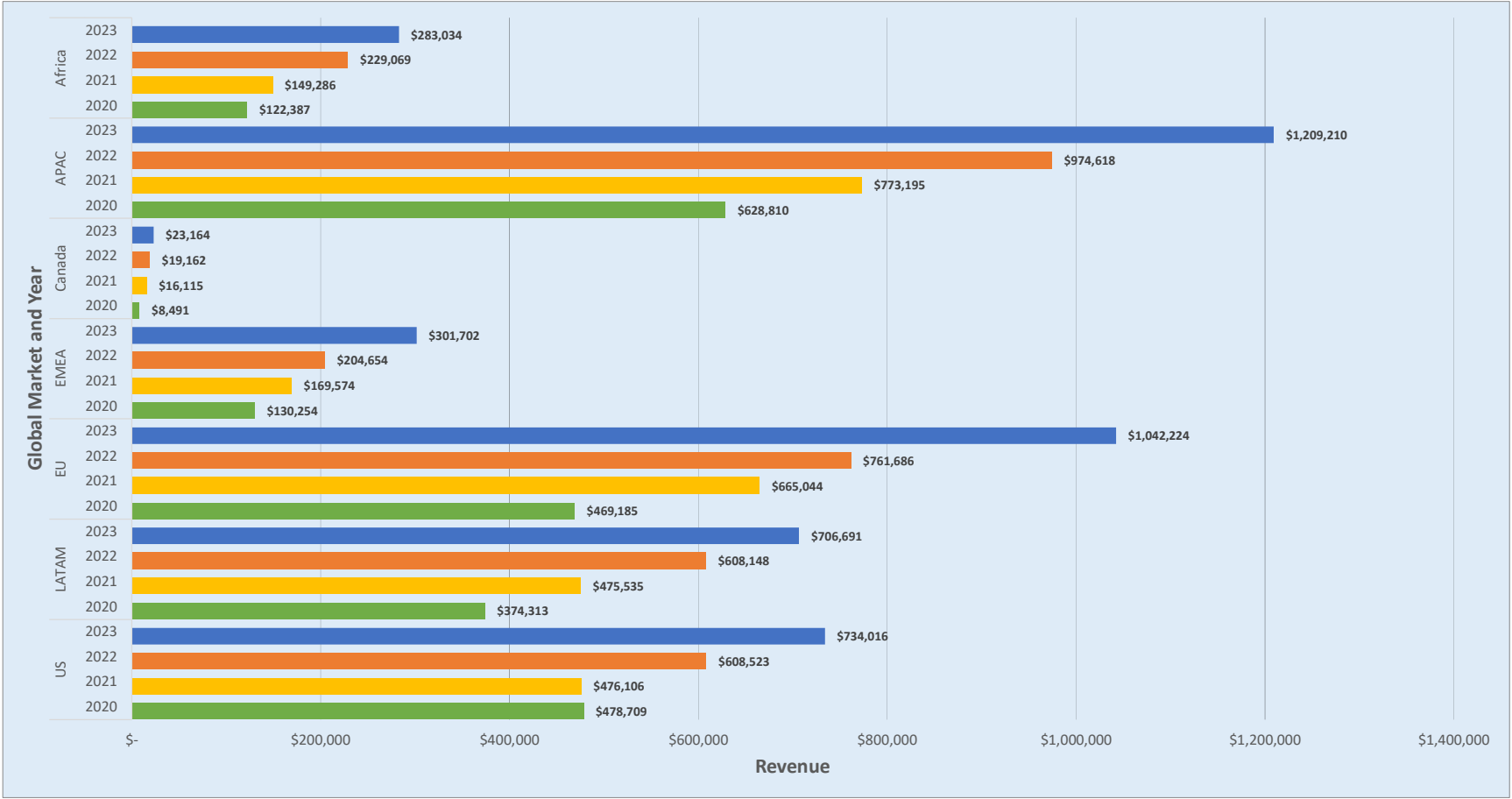
Analyzing Inventory Requirement using Confidence Intervals (Inferential Statistics)

Problem: We have sales data for products from 2020 to 2023. We would like to know the inventory required to be maintained for each subcategory of item with 95% confidence level.

Solution: We will use the quantity of orders for each subcategory for the year 2023 to calculate monthly number of units sold for the 12 months. From this, we will calculate the mean order quantity as well as standard deviation for each month for each subcategory to obtain the confidence intervals for the requred number of units to be maintained in inventory. Since we have just 4 years of data, so this is a sample of data not the population. Here, the sample size is 12 since we will taking the sum of order quantity for each 12 months. Since, the company has been in business for around 25 years, so the Central Limit Theorem applies here which makes the the means Normally distributed. Since our sample size is small (n=12) and population variance is unknown, we will use the t-statistic. For the t-statistic, we have 11 degrees of freedom with $\alpha/2 = 0.025$ (since sample size is 12 and confidence interval is 95%). From the t-table, the value of t for 11 degrees of freedom and $\alpha/2 = 0.025$ is 2.20

Confidence Interval Lower Bound = Mean - $t_{df,\alpha/2}$(Standard Error)
Confidence Interval Upper Bound = Mean + $t_{df,\alpha/2}$(Standard Error)

Sample size	12
$t_{11,0.025}$	2.20

Total Orders Sub-category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean	Standard Error	Lower	Upper
Accessories	545	787	610	800	814	1,045	792	1,028	1,056	929	1,279	1,261	912	66.67	765	**1,059**
Appliances	319	325	543	431	554	506	379	609	539	537	688	648	507	34.72	430	**583**
Art	965	902	1,242	1,200	1,364	1,459	1,131	1,478	1,659	1,285	1,760	1,856	1,358	86.27	1,169	**1,548**
Binders	1,290	1,170	1,556	1,335	1,733	2,103	1,432	1,976	2,189	1,837	2,480	2,328	1,786	125.74	1,509	**2,062**
Bookcases	408	431	623	583	638	722	538	841	938	721	914	953	693	54.63	572	**813**
Chairs	671	697	884	944	894	1,122	860	1,126	1,230	1,208	1,354	1,346	1,028	67.98	878	**1,178**
Copiers	442	410	595	560	569	708	456	681	789	709	804	731	621	39.28	535	**708**
Envelopes	469	453	733	587	642	741	647	725	888	707	890	898	698	43.29	603	**794**
Fasteners	428	453	639	652	645	893	581	777	771	728	880	943	699	47.57	595	**804**
Furnishings	628	719	826	768	794	1,034	748	972	1,171	942	1,403	1,220	935	67.57	787	**1,084**
Labels	436	408	745	561	699	974	613	816	1,072	943	1,042	1,013	777	68.20	627	**927**
Machines	295	299	396	381	324	487	320	468	426	470	449	591	409	26.04	352	**466**
Paper	715	735	878	829	1,130	1,157	934	1,184	1,341	1,278	1,344	1,297	1,069	68.49	918	**1,219**
Phones	586	684	826	768	936	1,158	910	1,102	1,118	1,096	1,466	1,220	989	72.31	830	**1,148**
Storage	1,100	882	1,221	1,112	1,265	1,536	1,332	1,560	1,685	1,450	1,942	1,832	1,410	91.42	1,209	**1,611**
Supplies	423	496	585	601	715	821	543	896	753	791	968	951	712	52.48	596	**827**
Tables	185	174	221	212	238	343	167	284	292	275	293	399	257	20.41	212	**302**
Grand Total	9,905	10,025	13,123	12,324	13,954	16,809	12,383	16,523	17,917	15,906	19,956	19,487				

Since, we never want to go out of stock, so the upper bound of the confidence interval is the amount of inventory we should maintain for each subcategory for each month. The problem could be solved in another way by considering total weekly sales instead of monthly, so that we would have data for 52 weeks in a year. The sample size would increase to 52 making it possible to use the z-statistic for making inferences.

PART 2:
Data Visualization and Analysis using Dashboard and DAX in Power BI
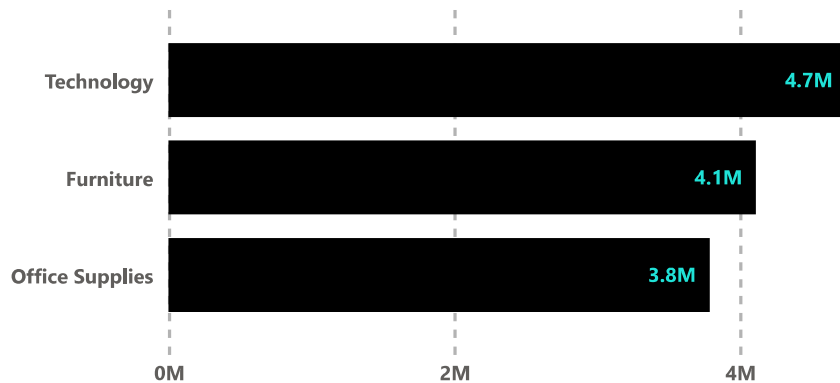
Category Revenue

12.64M Total Revenue	**178.3K** Total Quantity	**795** Total Customers	**25.0K** Total Orders

Category Revenue

- Technology: 4.7M
- Furniture: 4.1M
- Office Supplies: 3.8M

Sub-categroy	Category	Total Revenue	Orders
Accessories	Technology	749,307	2,889
Appliances	Office Supplies	1,011,081	1,686
Art	Office Supplies	372,163	4,366
Binders	Office Supplies	461,952	5,392
Bookcases	Furniture	1,466,559	2,284
Chairs	Furniture	1,501,682	3,187
Copiers	Technology	1,509,439	2,120
Envelopes	Office Supplies	170,926	2,310
Fasteners	Office Supplies	83,254	2,304
Furnishings	Furniture	385,609	2,965
Labels	Office Supplies	73,433	2,460

Weekly Revenue Trend

2021   2022   2023
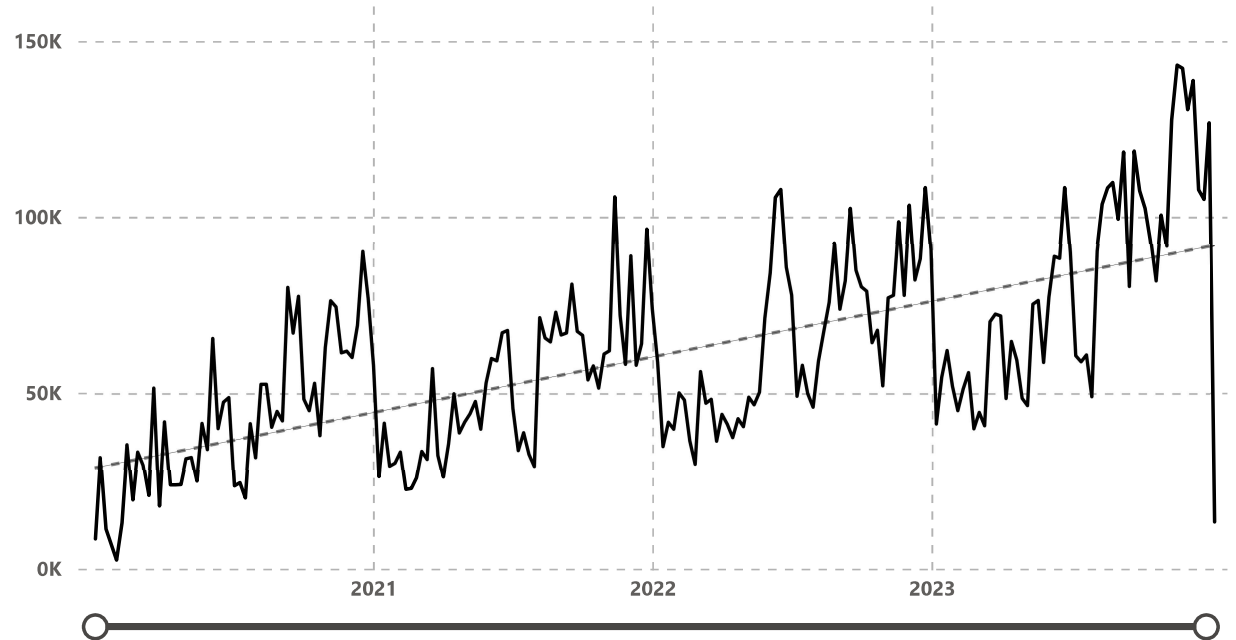
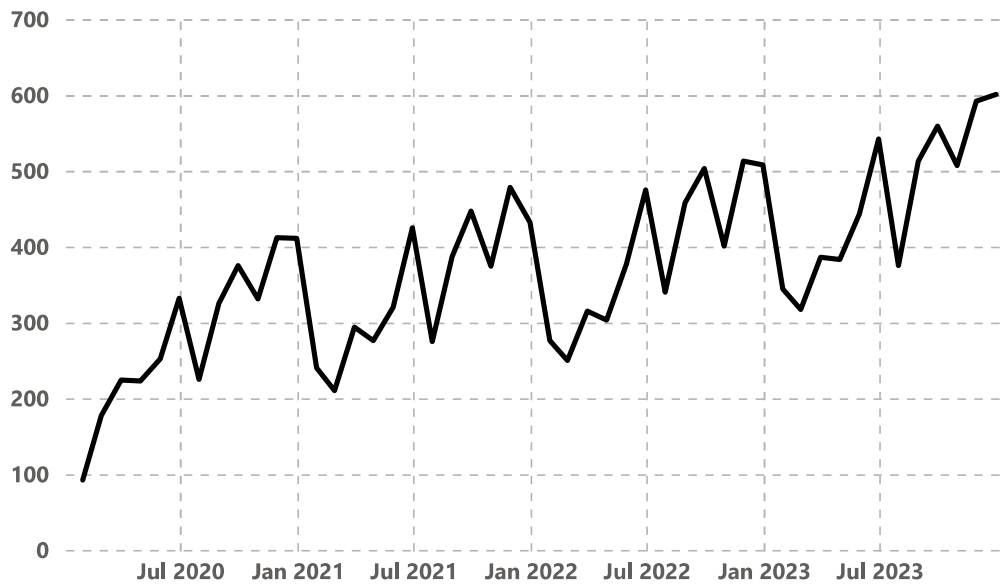| Monthly Revenue	Monthly Quantity	Monthly Orders
526,211 !	**7,852** ✓	**1,136** ✓
Prev. Month: 555,312 (-5.24%)	Prev. Month: 7,706 (+1.89%)	Prev. Month: 1,077 (+5.48%)

Monthly Customers Trend

Customer Distribution by Sub-category

Sub-category	Count
Art	795
Chairs	782
Accessories	774
Fasteners	753
Supplies	745
Copiers	735
Binders	794
Paper	781
Furnishings	773
Bookcases	750
Appliances	691
Tab...	
Storage	793
Phones	779
Labels	759
Envelopes	750
Machines	661
	519

Revenue per Customer Across market

Market	Revenue
APAC	4.5K
EU	3.7K
US	2.9K
LATAM	2.7K
EMEA	1.1K
Africa	1.0K
Canada	0.4K
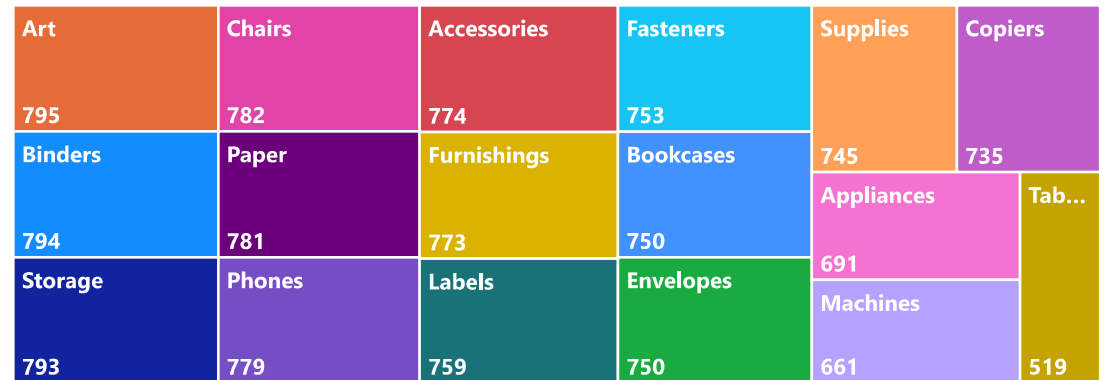
Top 10 Customers ▲	Total Revenue	Total Orders	Total Quantity
100177	30,246	24	207
100264	35,187	39	287
100301	31,778	43	325
100318	32,315	45	338
100408	35,552	34	310
100455	35,170	28	169
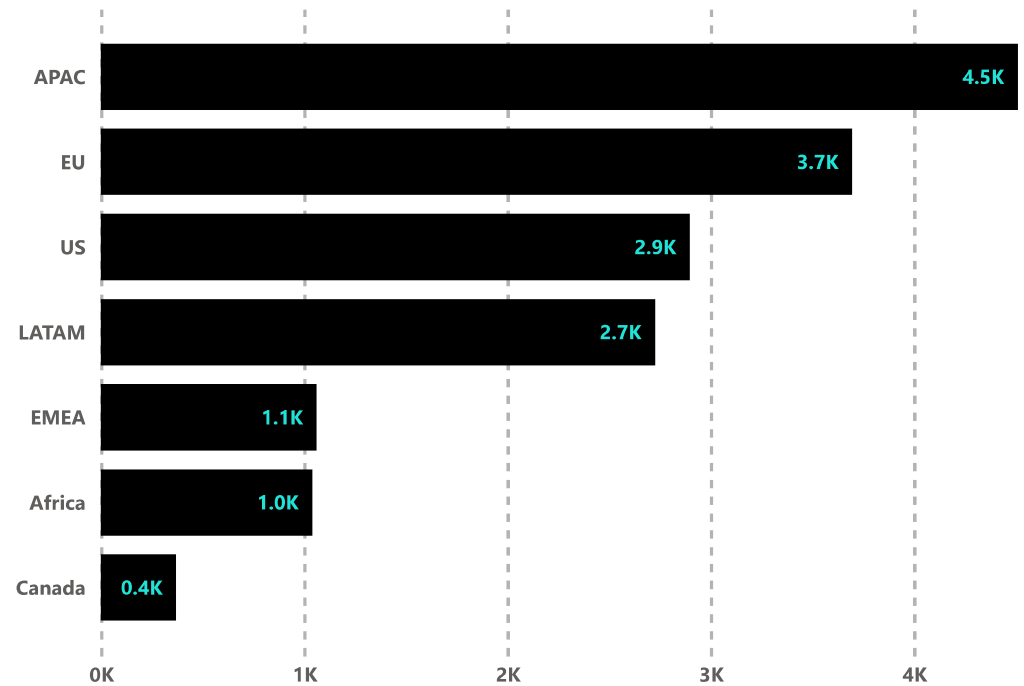
15.90K
Revenue Per Customer

Monthly Customer Growth
601 ✓
Prev. Month: 592 (+1.52%)

Select Year

Select all	2020	2021	2022	2023

Revenue by Sub-category

Sub-category	Revenue
Phones	1.71M
Copiers	1.51M
Chairs	1.50M
Bookcases	1.47M
Storage	1.13M
Appliances	1.01M
Machines	0.78M
Tables	0.76M
Accessories	0.75M
Binders	0.46M
Furnishings	0.39M
Art	0.37M
Paper	0.24M
Supplies	0.24M
Envelopes	0.17M
Fasteners	0.08M
Labels	0.07M

Axis: 0.0M, 0.5M, 1.0M, 1.5M, 2.0M
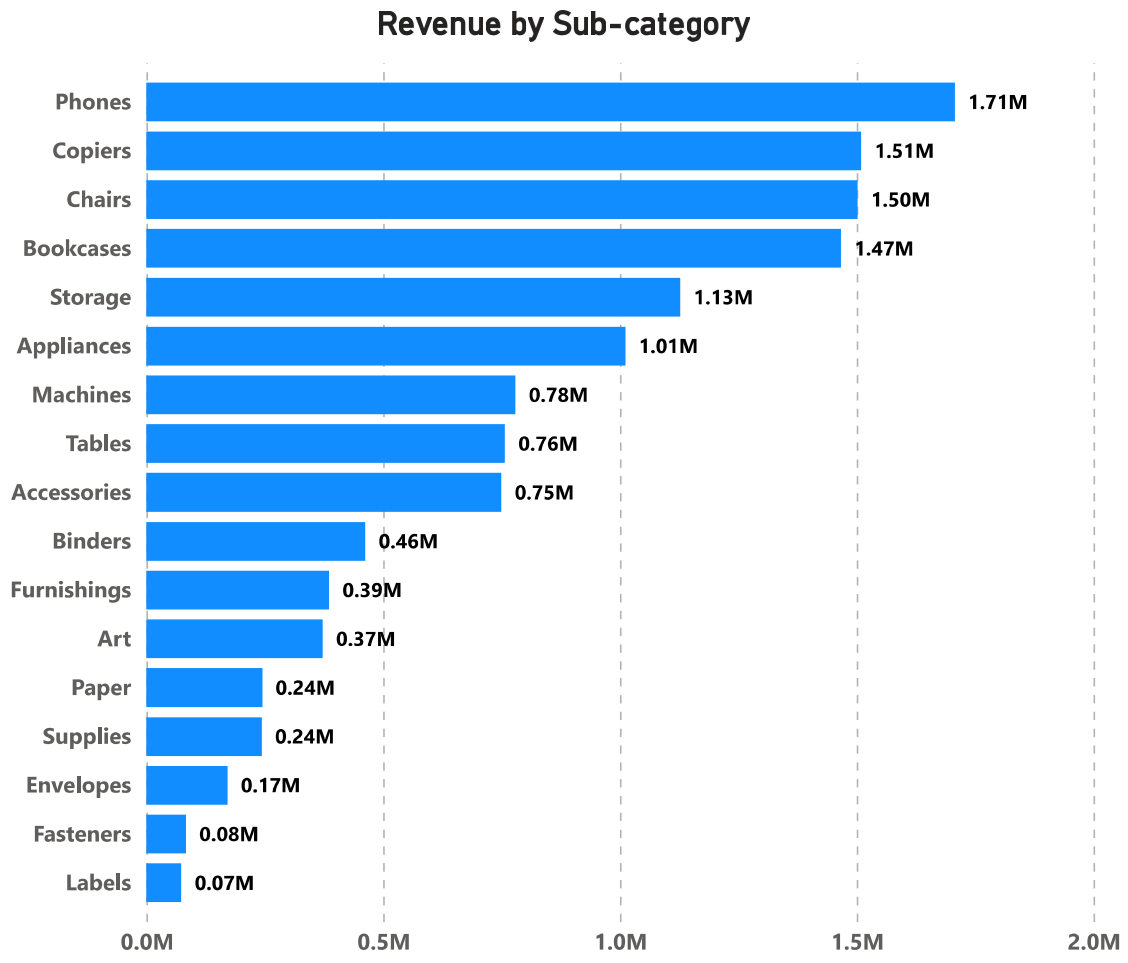
Sub-category	Total Revenue	Total Orders	Total Quantity
Accessories			
Africa	42,178	210	484
APAC	186,243	661	2,620
Canada	4,472	18	42
EMEA	44,166	232	565
EU	163,082	427	1,761
LATAM	141,765	623	2,498
US	167,401	718	2,976
Appliances			
Africa	62,196	138	313
APAC	307,621	322	1,310
Canada	7,941	15	30

Orders by Sub-category

Sub-category	Orders
Binders	5K
Storage	5K
Art	4K
Paper	3K
Chairs	3K
Phones	3K
Furnishings	3K
Accessories	3K
Fasteners	2K
Bookcases	2K
Supplies	2K
Labels	2K
Envelopes	2K
Copiers	2K
Appl...	2K
Machines	1K
Tab...	1K