

Question 1:

Write an SQL statement to find the total number of user sessions each page has each day.

(A user session is defined as continuous activity on a site where each activity is within 10 mins of each other.)

Answer:

```
1SELECT B.Page_id, B.Visit_Date, SUM((B.User_Sessions)) AS Total_User_Sessions
2FROM
3 (
4   SELECT A.User_id, A.Page_id, A.Visit_Date, MAX(A.Session_id) as User_Sessions
5   FROM
6     (SELECT User_id, Page_id, Visit_Date, DATEADD(MINUTE,
7       ROUND(DATEDIFF(MINUTE, 0, Visit_Time) / 10.0, 0) * 10 AS Visit_Time_Slot,
8       row_number() Over(partition by Page_id, user_id order by Visit_Time_Slot) AS Session_id
9     FROM XBI_RADBI_BIZ_APP.Page_Visit ) A
10    GROUP BY User_id, A.Page_id, A.Visit_Date
11  ) B
12 GROUP BY B.Page_id, B.Visit_Date
13
```

Page_Id	Visit_Date	Total_User_Sessions
54	2018-01-01	1
54	2018-01-02	1
55	2018-01-01	4
55	2018-01-02	2
56	2018-01-02	4

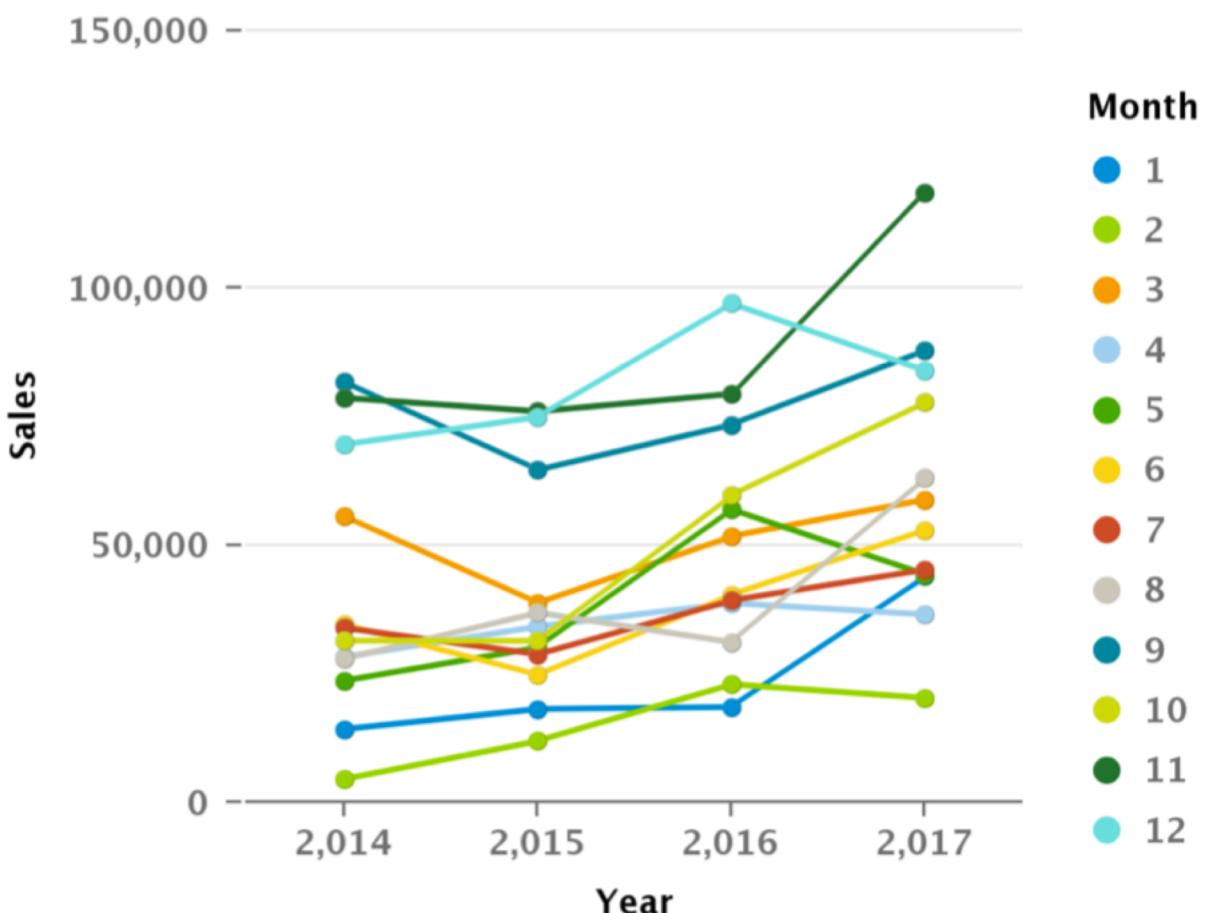
Question 2:

1. Which month has the highest sales? Is there any seasonality effect?

Answer:

November is month of highest sales.

Yes, there is a seasonality effect, in general last quarter sales is higher compared to other quarters.



Question 2:

2. Which product is the recent best seller?

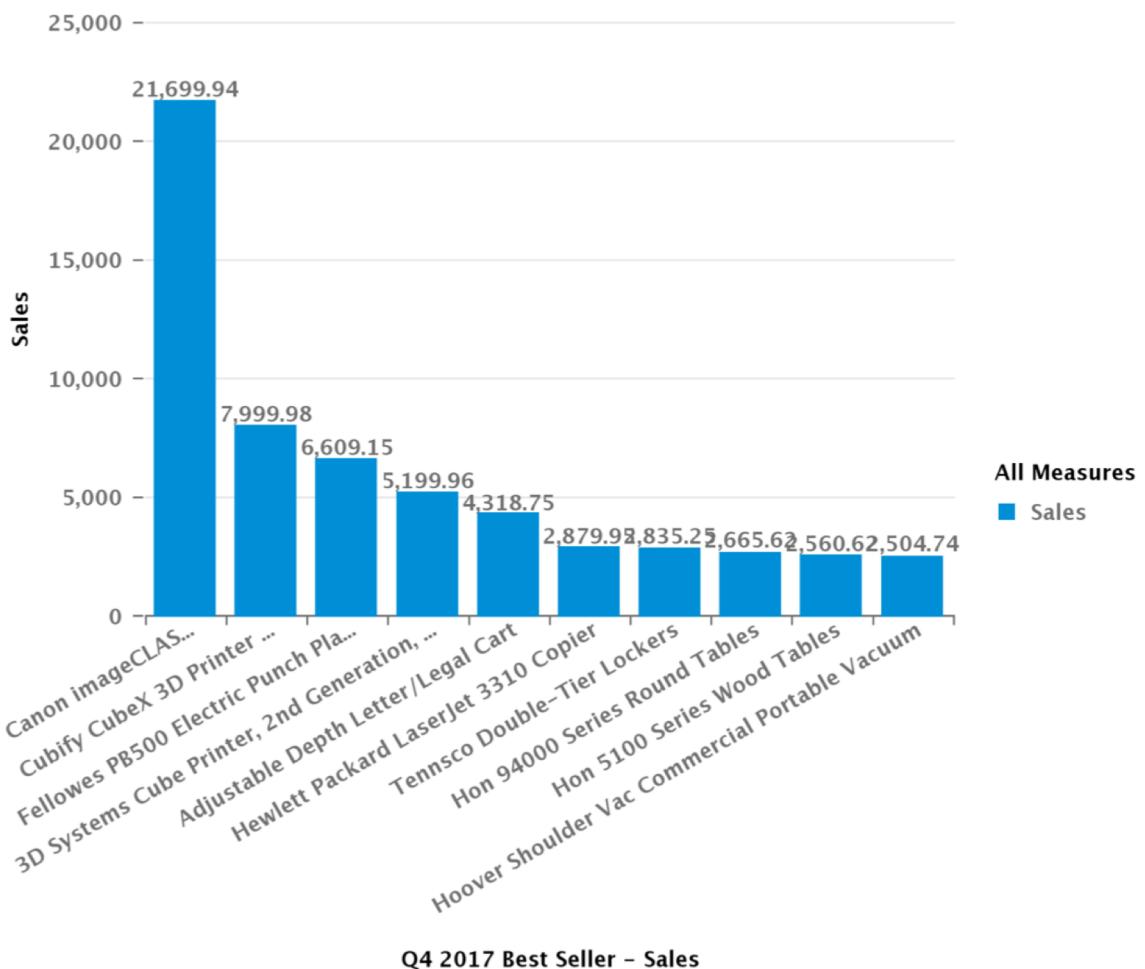
Answer:

In terms of sales **Canon image CLASS 2200 Advanced Copier** was the best seller in the last two years. In terms of quantity the **Staples** are the highest.

Year	ProductName	Sales
2017	Canon imageCLASS 2200 Advanced Copier	\$35,699.90
2016	Canon imageCLASS 2200 Advanced Copier	\$25,899.93
2014	Cisco TelePresence System EX90 Videoconferencing Unit	\$22,638.48
2015	Fellowes PB500 Electric Punch Plastic Comb Binding Machine with Manual Bind	\$15,760.28

Year	ProductName	Quantity
2017	Staples	68
2016	Staples	56

This trend continues in the last quarter of 2017. Below is the top 10 best sellers in Sales and quantity for Q4 2017. **Canon image CLASS 2200 Advanced Copier** tops in sales and **Staples** tops in quantity.



3. Is there any group of products which are often bought together?

There are about 95 Products that have been bought together with other Products. Further we can maintain or create a product hierarchy to map the type of products, this will be helpful to analyse a lot more on the group of products that bought together by the customers.

```
1 SELECT DISTINCT A.PRODUCT_ID, A.JOINT_PRODUCT, A.JOINT_ORDERS
2 FROM
3 (SELECT TEMP_1.PRODUCT_ID, TEMP_2.PRODUCT_ID AS JOINT_PRODUCT, COUNT(*) AS JOINT_ORDERS
4 FROM XBI_RADBI_BIZ_APP.Sample_data TEMP_1 INNER JOIN XBI_RADBI_BIZ_APP.Sample_data TEMP_2
5 ON TEMP_1.ORDER_ID = TEMP_2.ORDER_ID AND TEMP_1.PRODUCT_ID <> TEMP_2.PRODUCT_ID
6 GROUP BY TEMP_1.PRODUCT_ID, TEMP_2.PRODUCT_ID
7) A
8 WHERE A.JOINT_ORDERS > 1
9
```

PRODUCT_ID	JOINT_PRODUCT	JOINT_ORDERS
TEC-PH-10004447	FUR-TA-10001039	2
OFF-BI-10001359	FUR-FU-10003832	2
OFF-AR-10001683	OFF-BI-10000474	2
FUR-FU-10004053	TEC-AC-10002006	2
OFF-PA-10001667	OFF-ST-10004507	2
OFF-BI-10000069	FUR-FU-10001487	2
TEC-PH-10003885	FUR-CH-10003379	2
OFF-PA-10002262	OFF-ST-10002214	2
OFF-SU-10004782	TEC-AC-10002006	2
FUR-TA-10001039	TEC-PH-10004447	2
TEC-AC-10003399	OFF-SU-10001574	2
FUR-FU-10003464	TEC-PH-10002496	2
OFF-BI-10001634	OFF-BI-10004001	2
TEC-AC-10000290	OFF-PA-10001970	2
OFF-AR-10000914	TEC-AC-10000057	2
TEC-AC-10002006	FUR-FU-10004053	2
OFF-BI-10002160	OFF-AR-10004999	2
TEC-AC-10004659	OFF-ST-10000617	2
OFF-BI-10001658	TEC-PH-10002834	2
TEC-AC-10004659	OFF-BI-10004584	2

A semantic can be build to store the unique combinations of all products that are ordered together. This will be helpful in creating metrics and insights to build dashboards for further analysis.

```

1(
2SELECT C.ORDER_ID, C.PRODUCT_ID, row_number() Over(partition by C.ORDER_ID order by C.PRODUCT_ID) AS PRODUCT_COUNT
3FROM XBI_RADBI_BIZ_APP.Sample_data C
4WHERE C.ORDER_ID IN
5
6(
7  (SELECT B.Order_ID
8   FROM
9    (
10     SELECT A.Order_ID, Count(A.Product_ID) AS Product_Count          FROM
11      (Select Distinct Order_ID, Product_ID FROM  XBI_RADBI_BIZ_APP.Sample_data ) A
12      GROUP BY A.Order_ID
13    )B
14 WHERE B. Product_Count >1)
15 )
16 GROUP BY 1, 2
17 )
18

```

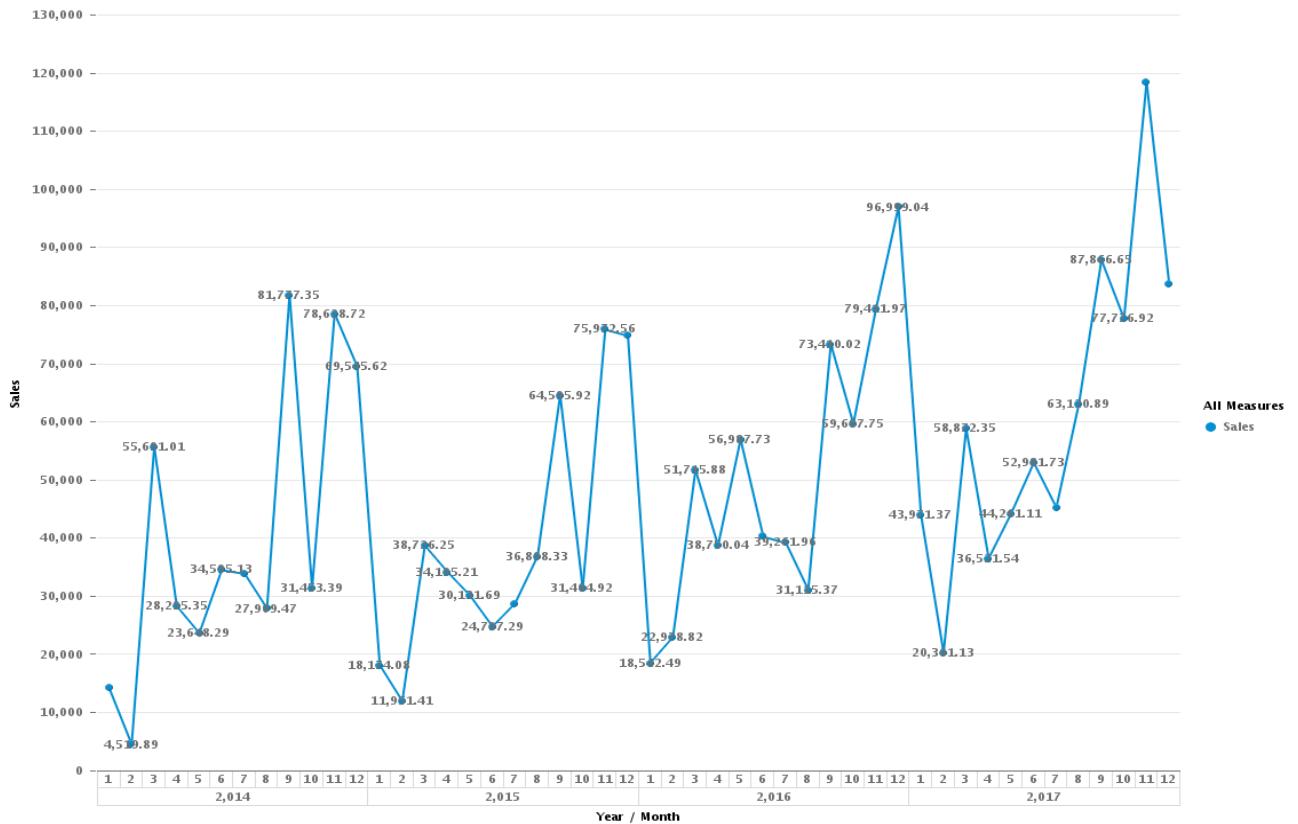
Result 1 Me

ORDER_ID	PRODUCT_ID	PRODUCT_COUNT
CA-2014-100090	FUR-TA-10003715	1
CA-2014-100090	OFF-BI-10001597	2
CA-2014-100363	OFF-FA-10000611	1
CA-2014-100363	OFF-PA-10004733	2
CA-2014-100678	FUR-CH-10002602	1
CA-2014-100678	OFF-AR-10001868	2
CA-2014-100678	OFF-EN-10000056	3
CA-2014-100678	TEC-AC-10000474	4
CA-2014-100706	FUR-FU-10002268	1
CA-2014-100706	TEC-AC-10001314	2
CA-2014-100762	OFF-AR-10000380	1
CA-2014-100762	OFF-LA-10003930	2
CA-2014-100762	OFF-PA-10001815	3

Order_ID	Product Count	1	2	3	4	5	6	7
2 CA-2014-10398	7 FUR-FU-10002508	FUR-FU-10003981	OFF-BI-10001196	OFF-LA-10000443	OFF-ST-10000918	TEC-AC-10002647	TEC-PH-10004667	
3 CA-2014-10643	9 FUR-CH-10003833	OFF-AR-10001419	OFF-BI-10002571	OFF-BI-10004209	OFF-FA-10002975	OFF-PA-10000477	OFF-ST-10001963	
4 CA-2014-10818	7 OFF-EN-10004846	OFF-FA-10000735	OFF-PA-10001838	OFF-SU-10003567	TEC-AC-10003038	TEC-PH-10001557	TEC-PH-10001760	
5 CA-2014-11078	7 FUR-FU-10000550	FUR-FU-10000672	OFF-BI-10003305	OFF-LA-10001474	OFF-PA-10000528	TEC-MA-10003183	TEC-PH-10001425	
6 CA-2014-11581	7 FUR-FU-10001487	FUR-TA-10001539	OFF-AP-10002892	OFF-AR-10002833	OFF-BI-10003910	TEC-PH-10002033	TEC-PH-10002275	
7 CA-2014-12936	8 OFF-BI-10001132	OFF-LA-10001569	OFF-LA-10004409	OFF-PA-10001569	OFF-ST-10001031	OFF-SU-10000432	TEC-AC-10004227	
8 CA-2014-13988	7 FUR-CH-100004287	OFF-AP-10002518	OFF-AR-10002656	OFF-AR-10004441	OFF-ST-10000991	TEC-MA-10000822	TEC-PH-10003931	
9 CA-2014-14276	8 FUR-FU-10001918	OFF-AP-10004785	OFF-FA-10000840	OFF-PA-10002923	OFF-SU-10001574	TEC-AC-10000865	TEC-AC-10001606	
0 CA-2014-14531	7 FUR-FU-10001986	FUR-FU-10004270	OFF-AR-10003183	OFF-FA-10003112	OFF-PA-10001804	TEC-MA-10002412	TEC-MA-10003626	
1 CA-2014-14538	7 FUR-CH-10002230	FUR-FU-1000023	FUR-FU-10002364	FUR-TA-10000238	OFF-AR-10001683	OFF-BI-10004001	OFF-PA-10002195	
2 CA-2014-16076	7 FUR-TA-10001039	OFF-AP-10002945	OFF-EN-10001099	OFF-PA-10000213	TEC-MA-100003979	TEC-PH-10000526	TEC-PH-10001536	
3 CA-2014-16530	7 OFF-AR-10003582	OFF-BI-10001267	OFF-BI-10001359	OFF-PA-10001033	OFF-PA-10003724	TEC-PH-10003505	TEC-PH-10004959	
4 CA-2014-16686	7 FUR-BI-10001608	OFF-BI-10000756	OFF-PA-10000587	OFF-PA-10001166	OFF-ST-100004123	TEC-MA-10001972	TEC-PH-10000369	
5 CA-2014-16718	7 FUR-CH-10004063	OFF-AR-10001662	OFF-BI-10004632	OFF-FIA-10001883	OFF-PA-10000955	TEC-PH-10004539	TEC-PH-100004977	
6 CA-2014-16792	8 FUR-FU-10002268	FUR-FU-10002918	OFF-AP-10002311	OFF-AR-10004456	OFF-BI-10000605	OFF-BI-10004364	OFF-ST-10000760	
7 CA-2015-10434	9 FUR-BI-100003450	FUR-FU-10001473	FUR-FU-10002456	FUR-TA-10000849	OFF-AR-10001473	OFF-AR-10001545	OFF-PA-10001166	
8 CA-2015-11213	7 FUR-CH-10002965	OFF-AP-10003266	OFF-AP-10003622	OFF-AR-10001468	OFF-PA-10002230	OFF-ST-10000563	TEC-AC-10001542	
9 CA-2015-11928	7 OFF-AR-10001118	OFF-AR-10003373	OFF-BI-10001575	OFF-BI-10001982	OFF-EN-10000927	OFF-LA-10002312	OFF-LA-10003510	
0 CA-2015-12172	8 FUR-CH-100003312	FUR-FU-10003464	OFF-BI-10000380	OFF-BI-10001308	OFF-BI-10004593	OFF-ST-10001780	OFF-ST-100003816	
1 CA-2015-12480	7 OFF-AP-10004980	OFF-BI-10000778	OFF-BI-10003984	OFF-PA-10000501	OFF-ST-10000798	OFF-ST-10002743	TEC-PH-10001750	
2 CA-2015-12655	7 FUR-CH-10004477	FUR-FU-10001861	OFF-AR-10003190	OFF-BI-10003114	TEC-PH-10000526	TEC-PH-10003505	TEC-PH-10003963	
3 CA-2015-12672	7 FUR-CH-10001708	FUR-FU-10001591	FUR-FU-10002813	OFF-PA-10001639	OFF-ST-10000129	TEC-PH-100001418	TEC-PH-100003174	
4 CA-2015-13097	7 FUR-BI-10002916	FUR-FU-10002506	FUR-TA-10004619	OFF-PA-10000743	OFF-PA-10001019	OFF-PA-10003823	TEC-AC-10000395	
5 CA-2015-13133	10 FUR-FU-10001706	FUR-FU-10002157	FUR-TA-10002607	OFF-BI-10000545	OFF-FA-10000992	OFF-PA-10001357	OFF-ST-10000642	
6 CA-2015-13262	9 FUR-FU-10002918	OFF-AR-10002987	OFF-BI-10001634	OFF-BI-10002854	OFF-BI-10004001	OFF-FA-10002763	OFF-LA-10000476	
7 CA-2015-15842	9 FUR-CH-10000309	OFF-BI-10000050	OFF-BI-100001453	OFF-PA-10001801	OFF-ST-10000563	OFF-ST-10002444	OFF-ST-100004186	
8 CA-2015-16220	7 FUR-FU-10001185	OFF-AR-10003856	OFF-BI-10002429	OFF-LA-10001982	OFF-PA-10001215	OFF-PA-10002581	OFF-ST-10000046	
9 CA-2015-16488	9 FUR-BI-10002213	FUR-CH-100004218	FUR-FU-10004272	OFF-BI-10004519	OFF-FA-10000584	OFF-PA-10000157	OFF-ST-100003638	
0 CA-2015-16562	7 OFF-AP-10000828	OFF-AP-10001492	OFF-LA-10003190	OFF-PA-10002319	OFF-PA-100002499	OFF-PA-10003893	TEC-AC-100004568	
1 CA-2015-16701	8 FUR-BO-10004218	FUR-FU-10001037	FUR-FU-10001468	OFF-AP-10004036	OFF-BI-10002072	OFF-ST-100003816	TEC-PH-10000347	
2 CA-2016-10573	10 FUR-FU-10003664	OFF-AP-10001394	OFF-LA-100004559	OFF-PA-10001838	OFF-PA-10002250	OFF-ST-10000419	OFF-ST-100004340	
3 CA-2016-10936	7 OFF-AP-10002998	OFF-BI-10002071	OFF-BI-10003981	OFF-FA-10001561	OFF-PA-10000477	OFF-PA-10001725	OFF-PA-100004359	
4 CA-2016-10966	7 OFF-AR-10004022	OFF-AR-10004582	OFF-BI-10000174	OFF-ST-10000991	OFF-SU-10001218	OFF-SU-10002522	TEC-PH-10004774	
5 CA-2016-11166	7 FUR-CH-10003968	OFF-AR-10001686	OFF-BI-10001460	OFF-PA-10000587	OFF-PA-10001569	OFF-ST-10000604	TEC-AC-10002167	
6 CA-2016-12082	7 FUR-CH-10000229	FUR-FU-10001424	OFF-AP-10001242	OFF-AR-10003469	OFF-BI-10001525	OFF-PA-10000232	OFF-ST-100002562	
7 CA-2016-13577	7 OFF-AR-10001231	OFF-AR-10001246	OFF-EN-10004773	OFF-PA-10001295	OFF-PA-10004327	OFF-ST-10002743	OFF-ST-10003470	
8 CA-2016-14417	9 FUR-FU-10000758	OFF-AP-10002457	OFF-BI-10000282	OFF-LA-10001613	OFF-PA-10000892	OFF-PA-10001776	OFF-PA-100004030	

4. Is there any other insight you can get to help to improve sales number?

- Analysing the sales trend, the month of January and February have low sales and this can be boosted through online campaigns and promotional activities.



- Usually sales is high from September to December. During this time, actions should be taken to retain the trend and maintain the customer satisfaction.

- There are 87 products that were sold in all years from 2014 to 2016 but were not bought in 2017. Below are the top 10 among the 87, based on historical sales. So this has to be analysed by the R&D or Marketing team to set it right.

Product	2014	2015	2016	2017
Bretford CR8500 Series Meeting Room Furniture	1,202.94	2,085.1	3,488.53	0
Cisco Unified IP Phone 7945G VoIP phone	1,909.54	1,022.97	3,819.09	0
Fellowes Strictly Business Drawer File, Letter/Legal Size	704.25	563.4	3,211.38	0
Hon 2111 Invitation Series Corner Table	1,758.71	1,004.98	376.87	0
Hon Non-Folding Utility Tables	764.69	446.07	2,564.89	0
Okidata C331dn Printer	418.8	558.4	2,233.6	0
O'Sullivan Living Dimensions 5-Shelf Bookcases	1,538.02	1,352.4	530.35	0
Stur-D-Stor Shelving, Vertical 5-Shelf: 72"H x 36"W x 18 1/2"D	665.88	1,553.72	332.94	0
Tennsco Snap-Together Open Shelving Units, Starter Sets and Add-On Units	2,794.8	1,788.67	2,235.84	0
Wireless Extenders zBoost YX545 SOHO Signal Booster	2,078.89	453.58	1,511.92	0

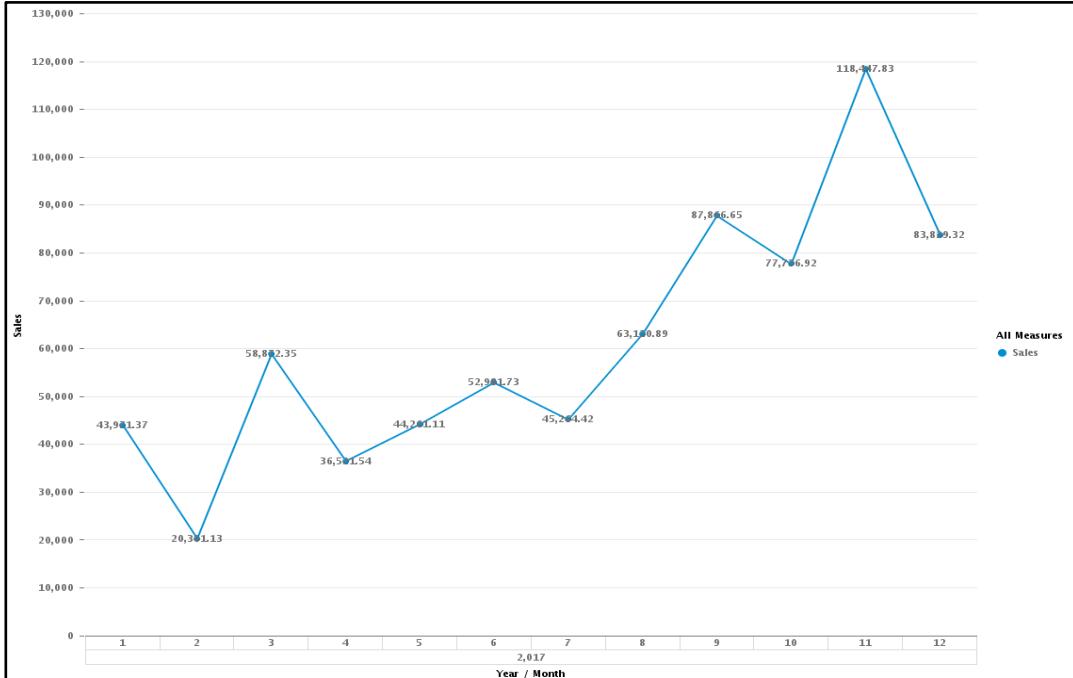
- There are 44 customers who placed orders in all three years from 2014 to 2016 but never placed any order in 2017. Below are the top 10 customers who never placed orders in 2017. This has to be analysed by the Customer relationship team.

Customer	2014	2015	2016	2017	Total Historical Sales
TC-20980	622.32	85.85	18,344.05	0	19,052.22
KD-16270	1,639.5	325.7	6,317.16	0	8,282.36
AH-10690	177.68	1,945.84	5,764.77	0	7,888.29
JD-15895	1,299.48	130.28	6,181.11	0	7,610.86
RH-19510	273.96	731.25	5,973.97	0	6,979.18
VD-21670	2,126.03	4,130.34	185.88	0	6,442.25
IM-15070	1,979.89	1,841.61	1,108.98	0	4,930.47
MC-17425	719.98	130.4	3,581.76	0	4,432.14
PW-19240	181.79	3,730.54	10.09	0	3,922.42
JS-15880	172.11	1,717.97	1,977.94	0	3,868.02

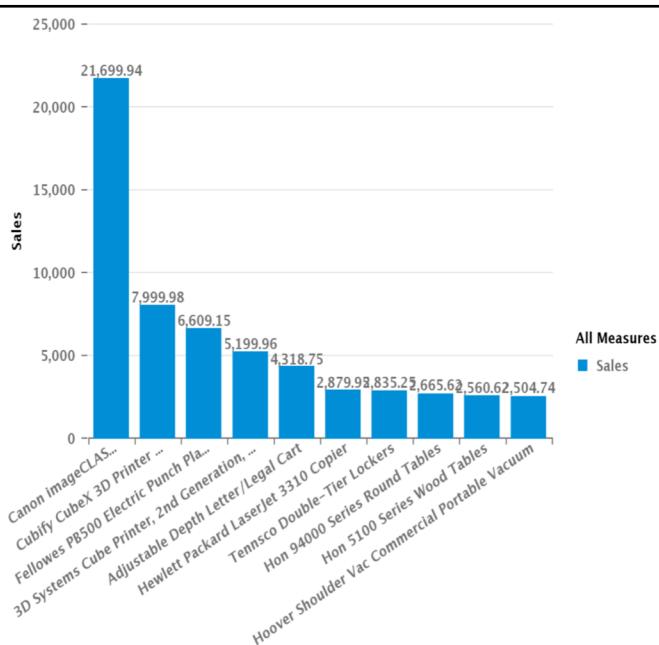
5. Based on the data we have, what kind of BI dashboards you would build in order to help the sales team monitoring the performance?

Sales Trend Analysis

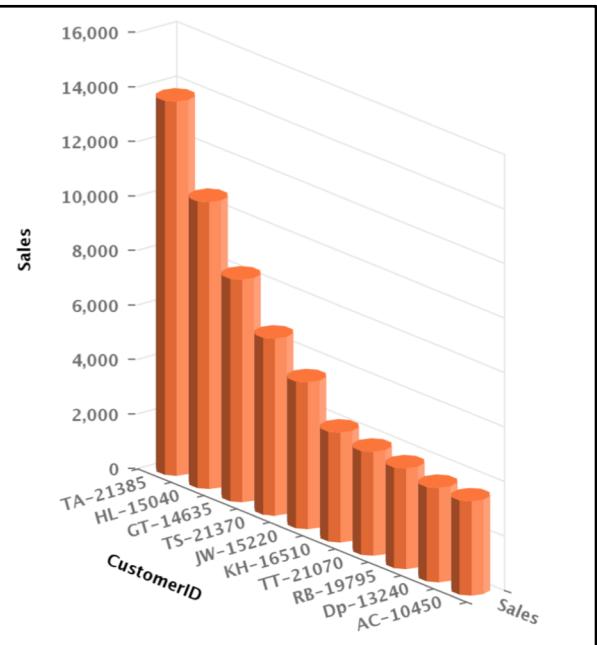
Select Year 2017▼



Current Year – Sales trend



Best Sellers – Last Quarter



Top 10 Customers – Last Quarter