

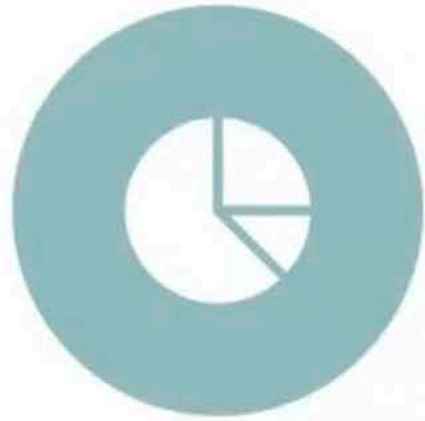
IIT Madras
ONLINE DEGREE

LEARNING OBJECTIVE OF THIS COURSE

At the end of this course you will learn:

- ❖ Sales and Revenue Analysis
- ❖ Production Planning and Analysis
- ❖ Profitability Analysis
- ❖ Raw Materials Requirement Analysis
- ❖ Human Resource Requirement Analysis

ACE GEARS LIMITED — BUSINESS PROFILE



MANUFACTURE & SUPPLY OF
AUTOMOBILE GEAR ASSEMBLIES TO
OEMS AND TIER-1 COMPANIES



HAS CUSTOMERS IN ALL FOUR
REGIONS OF INDIA



HAS NUMEROUS PRODUCTS BUT
ONLY 10 PRODUCTS ARE
CONSIDERED FOR THIS CASE STUDY

ACE GEARS COMPANY

- ❖ **ACE Gears** Manufactures Gear Assemblies and supplies them to OEMs (OEM-Original Equipment Manufacturer) and Tier-1 suppliers across India.
- ❖ At present, it produces 10 Gear Assemblies

Gear Type	Number of Assemblies
BS4 Engines Only	2
BS4 and BS6 Engines	6
BS6 Engines only	2

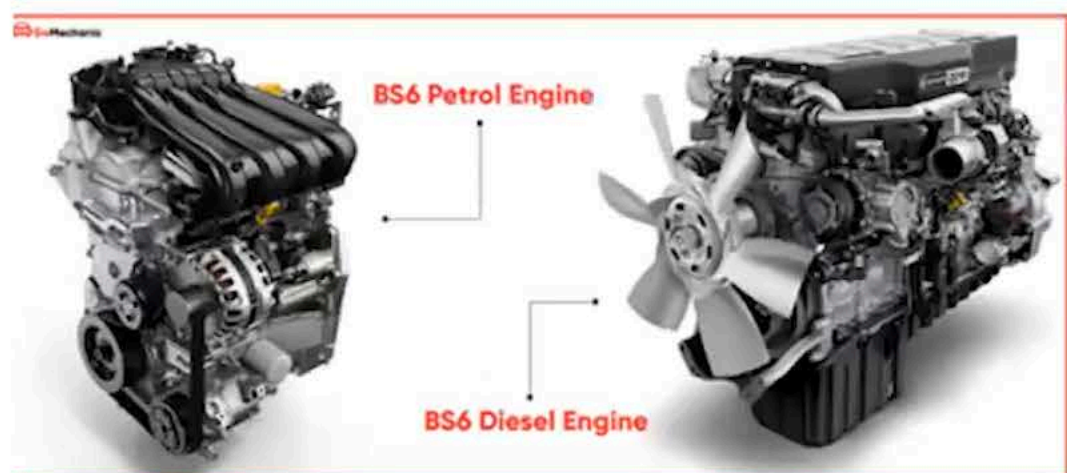
THE TEAM

Designation	Employee	Responsibilities
Sales Manager	Archana	Sales planning, Forecasting
Production Scheduler	Swarup	Production Scheduling
Shop-floor Manager	Francis	Inventory Management (Raw materials, Work-in-Progress, Finished Goods)
Purchase Manager	Razia	Raw Material Procurement
Finance Manager	Chandru	Profitability, Revenue, and other accounts related works
Human Resource Manager	Ashish	Workforce Planning

THE BACKGROUND

- ❖ Govt. of India has directed all automobile companies to migrate from BS4 engine to BS6 Engines
 - Pressure on OEMs and Suppliers to shift from BS4 to BS6
 - ❖ ACE Gears decides to discontinue gear assemblies for BS4 engines from April 1, 2020 according the Govt. norms
 - ❖ Simultaneously, manufacturing of gear assemblies for BS6 engines starts from April 1, 2020
 - ❖ CoVID pandemic has had impact on the automobile sector as a whole in 2020
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Illustrations on BS-4/6 engines/Gears

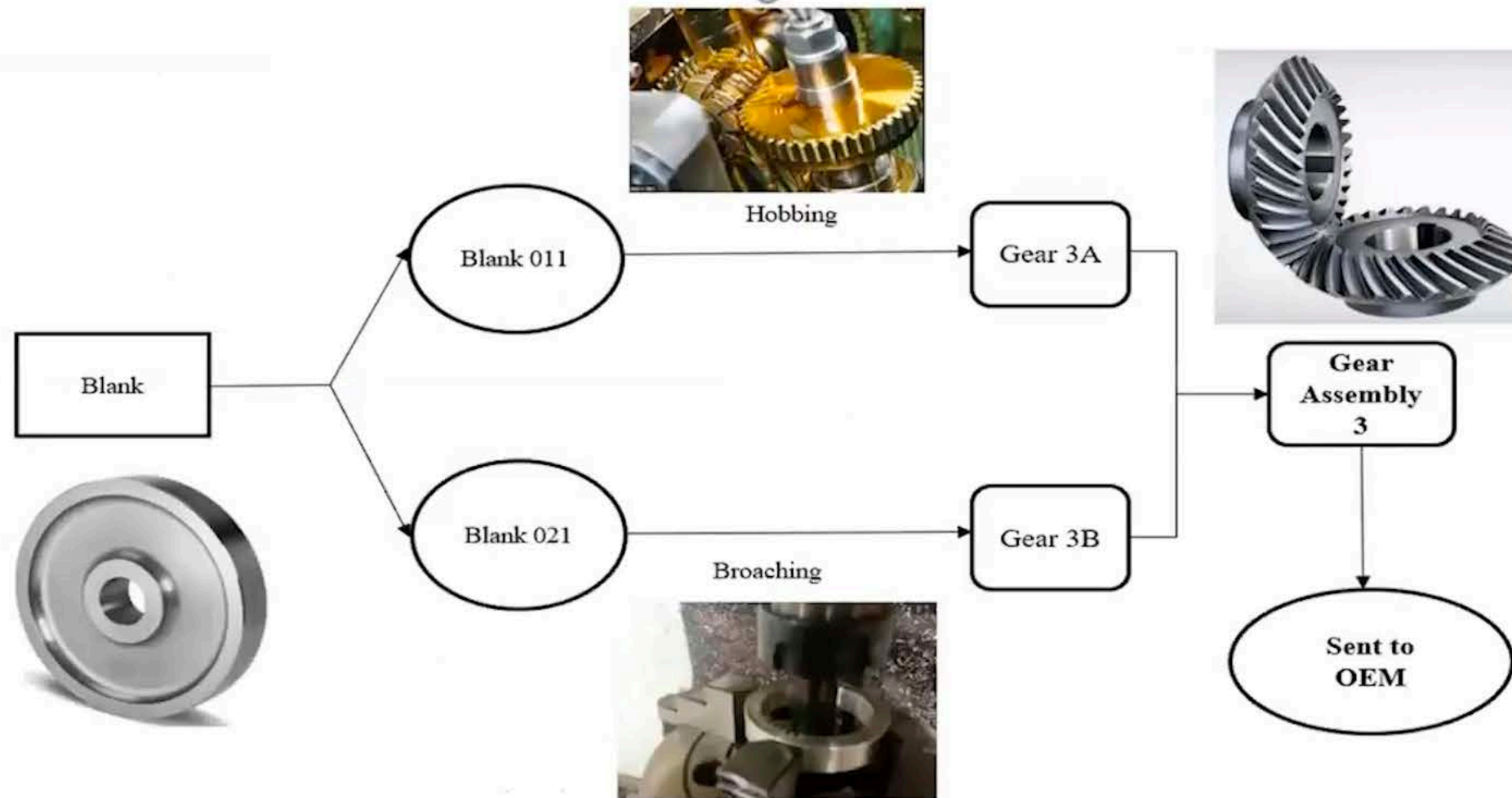


How BS6 Petrol and Diesel engines work to reduce emissions?

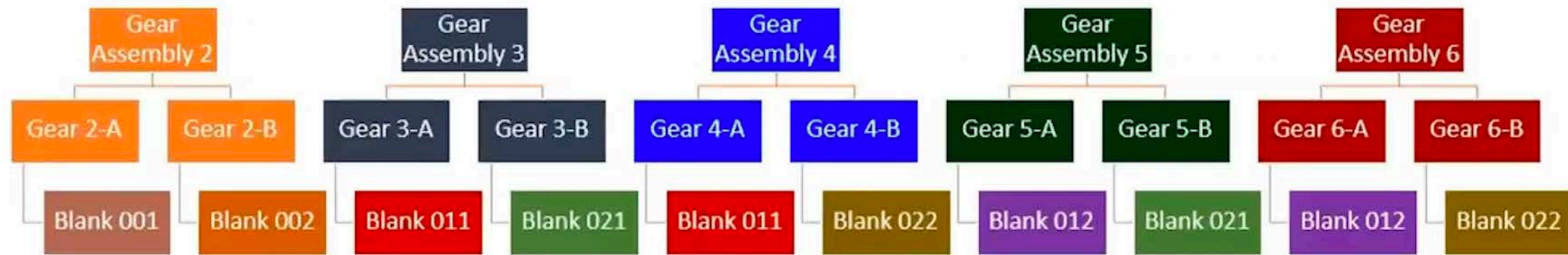
Emission Targets				
Engine Type	Mass of Exhaust Gas	BS4 Limit	BS6 Limit	Percentage Decrease
Petrol	CO (in mg/km)	1000	1000	Nil
	HC (in mg/km)	100	100	Nil
	Nox (in mg/km)	80	60	25
	PM (in mg/km)		4.5	
Diesel	CO (in mg/km)	500	500	Nil
	HC + NOx (in mg/km)	300	170	43
	Nox (in mg/km)	250	80	68
	PM (in mg/km)	25	4.5	82

Source: Autocar India

ACE Gears - Manufacturing Process



PRODUCT STRUCTURE (BILL OF MATERIALS)



ERP SYSTEMS

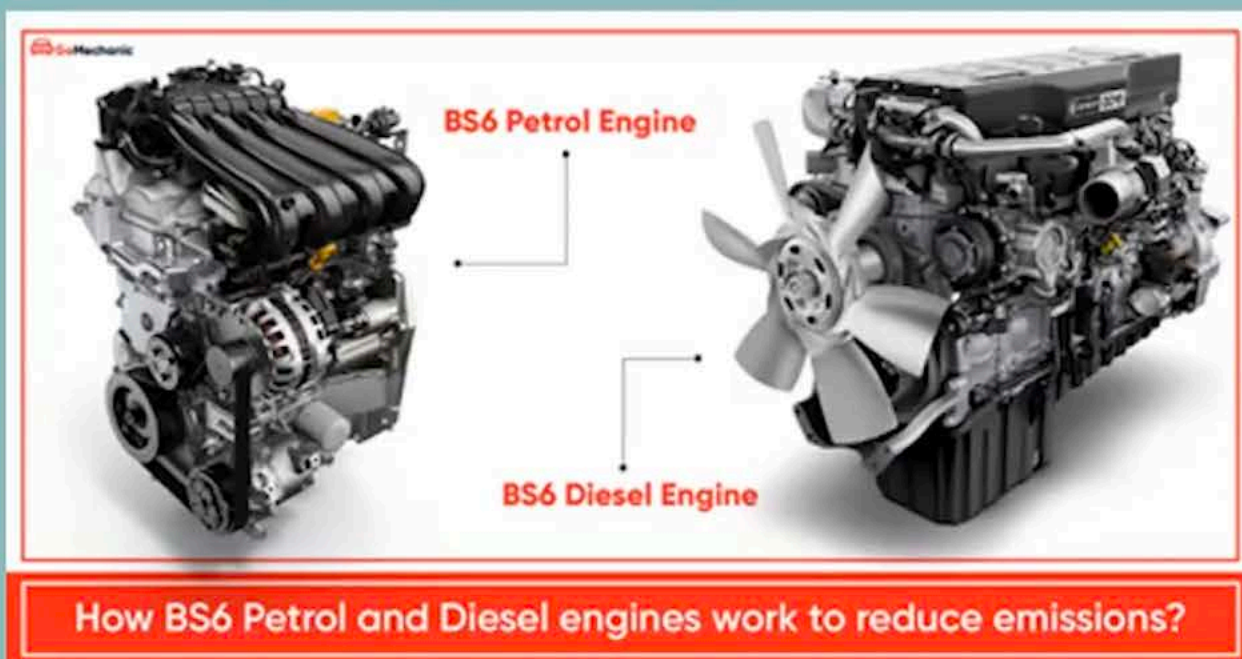
- Integrates the various planning and execution functions of a company
- Data flows seamlessly between departments, avoiding need for repeated data entry and avoiding errors
- Based on common master data elements such as customer, product, supplier, material data maintained commonly at company level



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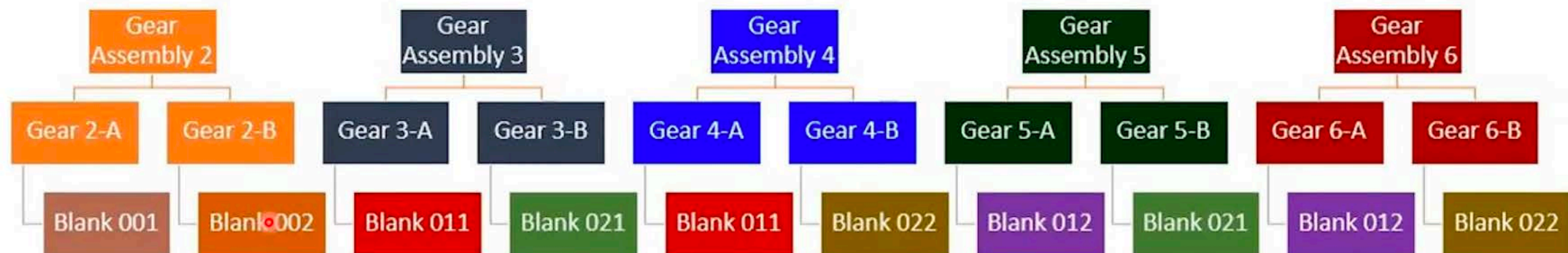
Source: Autocar India

PLANNING PROCESS

- Production Planning happens through a hierarchical process, with increasing level of detail
- As we go down the flow, the planning intervals get shorter and the plan units get more granular
- Strategic Business Plans are generally Annual, S&OP and MPS are generally month-wise, MRP may be weekly and Detailed Production Schedule is shift-wise



PRODUCT STRUCTURE (BILL OF MATERIALS)



Monthly/ Quarterly/Annual Revenue - Two Years

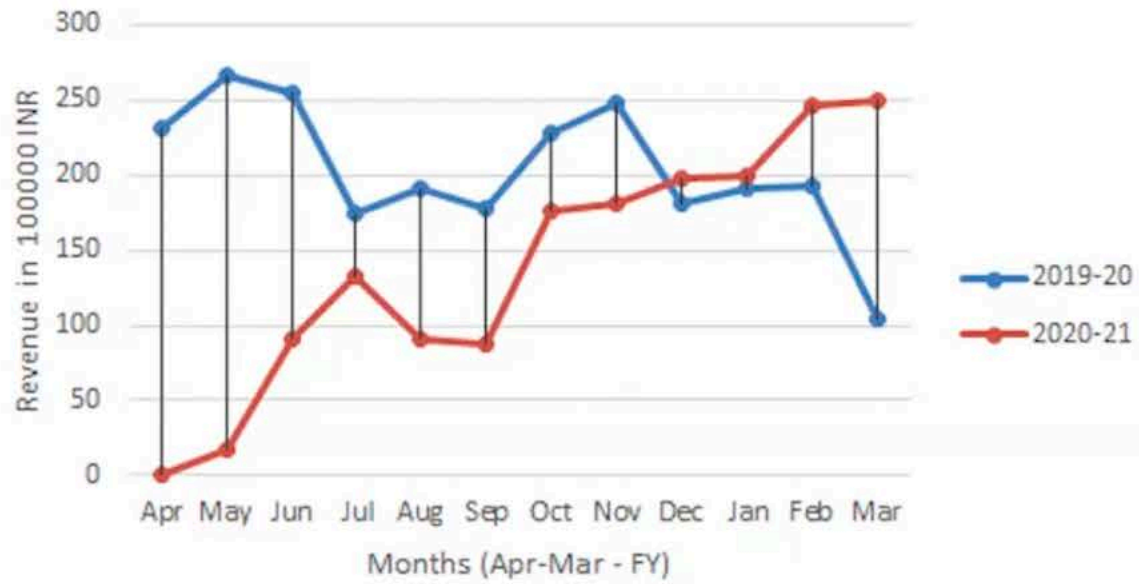
Month	2019-20	2020-21	% Change	2019-21
Apr	231.30	0	-100.00%	231.30
May	266.95	16.85	-93.69%	283.80
Jun	255.53	91.64	-64.14%	347.17
Jul	175.00	133.14	-23.92%	308.14
Aug	191.49	90.49	-52.74%	281.98
Sep	177.08	86.67	-51.05%	263.77
Oct	227.38	175.41	-22.86%	402.79
Nov	248.46	181.43	-26.98%	429.90
Dec	181.77	198.13	9.00%	379.91
Jan	190.72	199.92	4.82%	390.64
Feb	192.82	245.98	27.57%	438.80
Mar	103.88	250.19	140.85%	354.07
Total	2,442.39	1,669.86	-31.63%	4,112.26

Quarter	2019-20	2020-21	% Change	Grand Total
Q1	753.79	108.49	-85.61%	862.27
Q2	543.57	310.32	-42.91%	853.89
Q3	657.62	554.97	-15.61%	1212.59
Q4	487.42	696.08	42.81%	1183.50
Grand Total	2,442.40	1,669.86	-31.63%	4,112.26

All Revenue Figures are in INR Lakhs

Monthly/ Quarterly/Annual Revenue -Graphs

Month Wise - Revenue 2019-2021



Quarter-wise Revenue

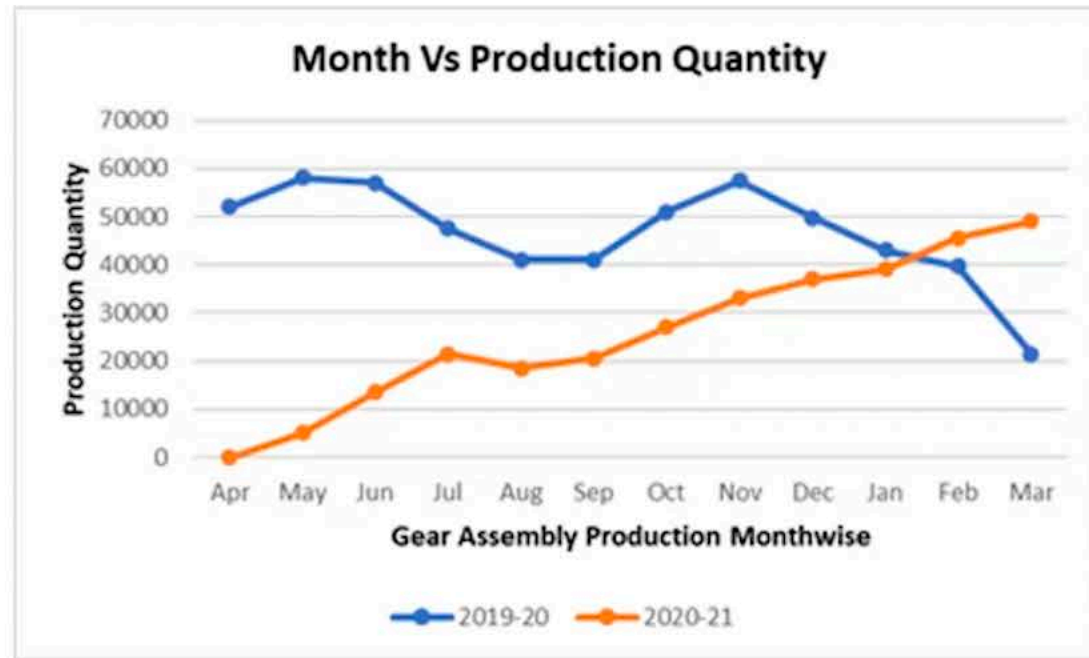


Gear Assembly Based on Production and Sales Quantity - Two Years

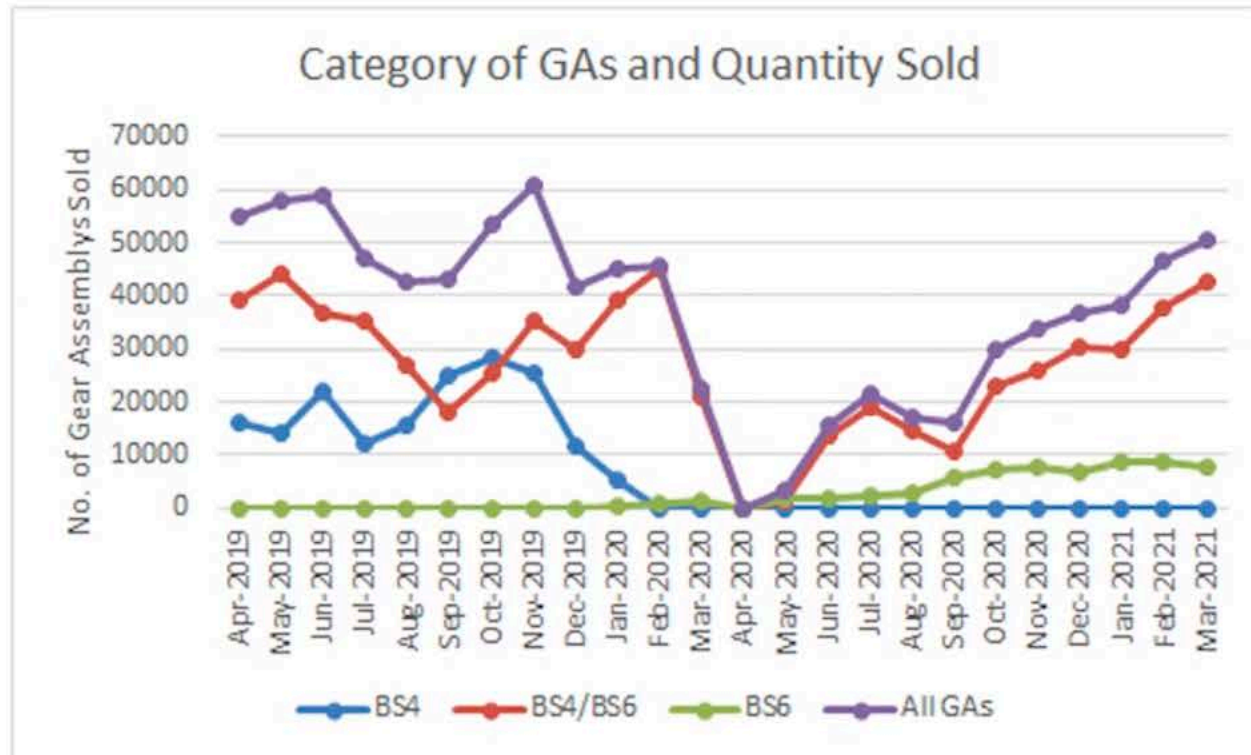
Production Quantity			
Month	2019-20	2020-21	Grand Total
Apr	52,000	0	52,000
May	58,000	5,000	63,000
Jun	57,000	13,500	70,500
Jul	47,500	21,500	69,000
Aug	41,000	18,500	59,500
Sep	41,000	20,500	61,500
Oct	51,000	27,000	78,000
Nov	57,500	33,000	90,500
Dec	49,750	37,000	86,750
Jan	42,950	39,000	81,950
Feb	39,750	45,500	85,250
Mar	21,500	49,000	70,500

Sales Quantity			
Month	2019-20	2020-21	Grand Total
Apr	54,932	0	54,932
May	58,121	3,189	61,310
Jun	58,676	15,617	74,293
Jul	47,291	21,534	68,825
Aug	42,426	17,195	59,621
Sep	43,247	16,244	59,491
Oct	53,658	29,903	83,561
Nov	60,671	33,558	94,229
Dec	41,502	36,899	78,401
Jan	44,959	38,344	83,303
Feb	45,795	46,638	92,433
Mar	22,555	50,618	73,173

Month Wise Production and Sales Quantity -Graphs



What does Archana learn from this Graph?



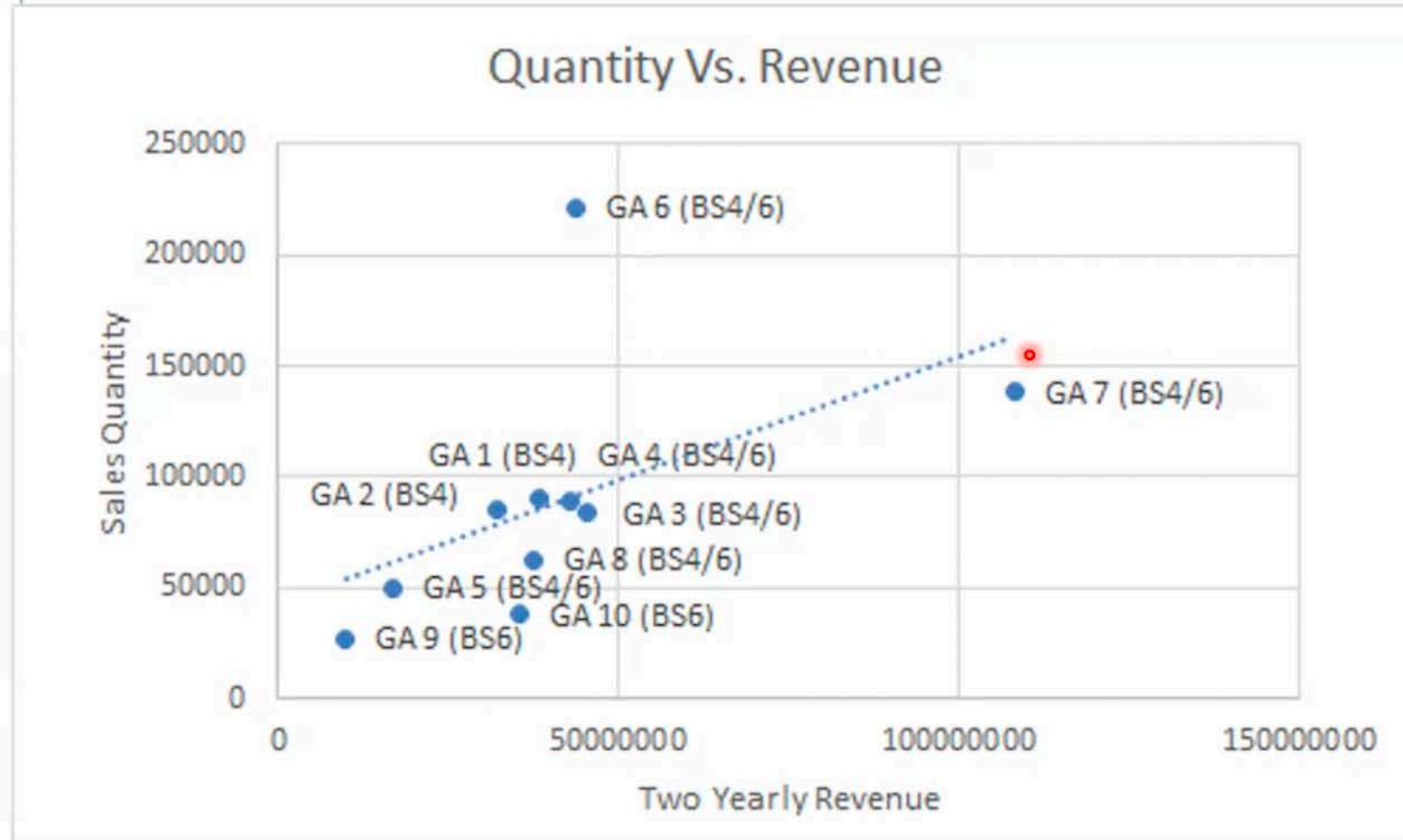
In which months of the FY 2019-20 did the sale of BS4 category gears surpassed other categories?

Why is there a decline in sales of BS4 after Nov-19? Why is there a sales of BS6 even before the Govt. mandated time?

When did the difference between BS6 and BS4/BS6 categories least in terms of quantity produced?

During the period Apr-2019 to Dec-2019, when did the difference between BS4 and BS4/BS6 categories most in terms of quantity produced?

GEAR ASSEMBLY SALES QUANTITY VS. REVENUE



What can be inferred from this graph?

What goes into making GAs and why are some GAs cheaper than others?

GA6 - High Volume Product

GA7 - High Revenue Product

One Year Scatter Plot Amplify Cluster

ARCHANA'S CURIOSITY ANSWERED

1. Revenue Receipts of Each Region

Region	Oct-19	Nov-19	Dec-19	Total Revenue
North	62,76,200	6231575	45,57,600	1,70,65,375
East	71,08,150	7176550	34,40,800	1,77,25,500
West	26,90,550	4474400	35,37,500	1,07,02,450
South	66,62,990	7003840	66,41,510	2,03,08,340
Total	2,27,37,890	2,48,86,365	1,81,77,410	6,58,01,665

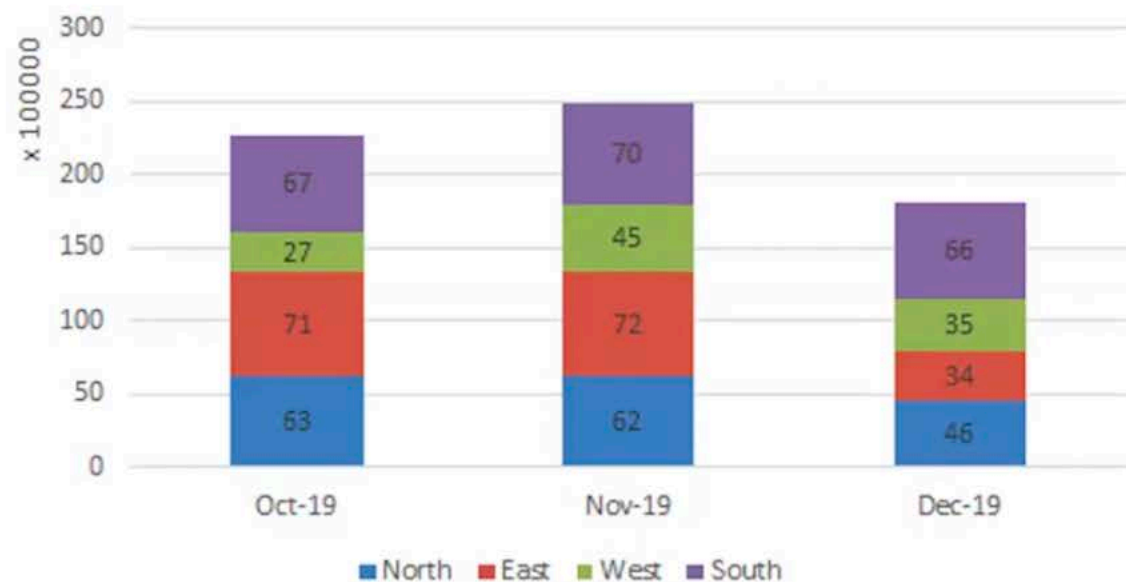
2. No. of Agents Needed and their Salary

Region	Oct-19 Volumes	Nov-19 Volumes	Dec-19 Volumes	Max	No. of Agents	Agent Salary/ Month
North	16,230	16,645	11,815	16,645	4	80,000
East	17,135	17,695	8,295	17,695	4	80,000
West	5,985	9,640	7,485	9,640	2	40,000
South	14,308	16,691	13,907	16,691	4	80,000
Total	53,658	60,671	41,502	60,671	14	2,80,000

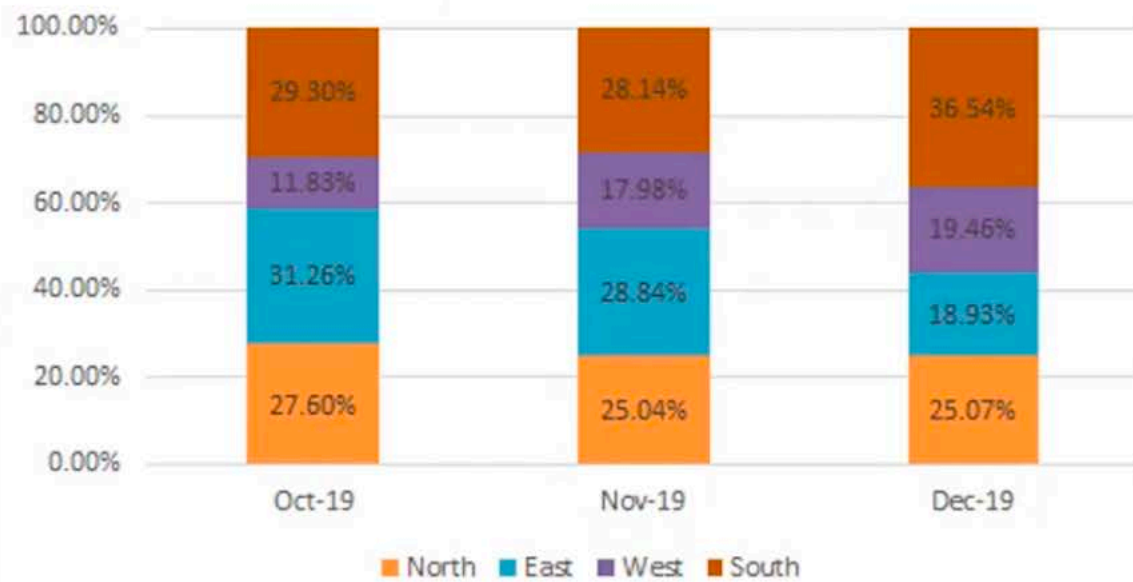
How do you calculate, how much revenue did each agent manage in a region on an average.

REGION WISE REVENUE DISTRIBUTION

Region wise Revenue Distribution in INR Lakhs



Regionwise % Revenue

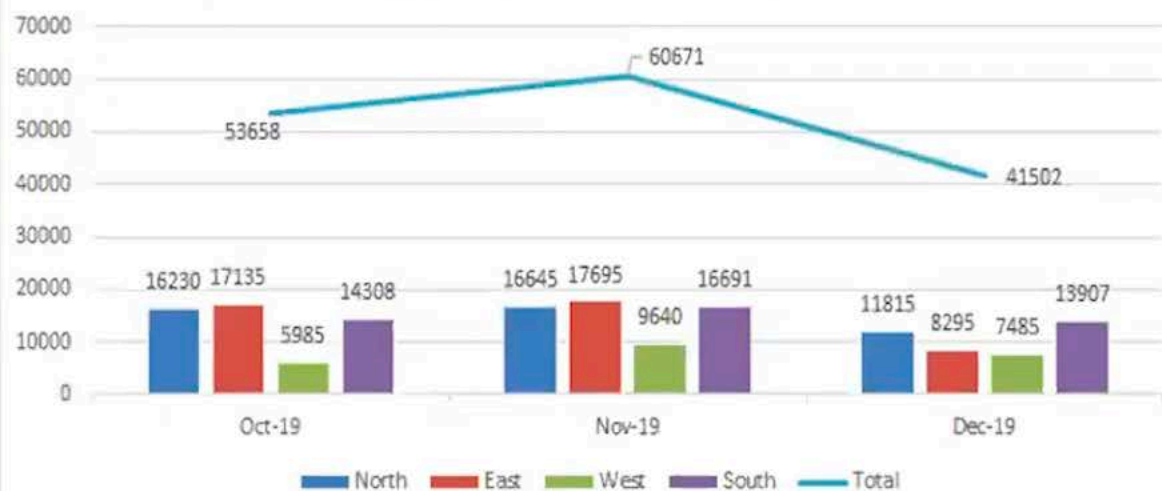


What can you infer the above graphs?

Why do you think there is a sudden dip in revenue in Dec in East and North region?

MONTH-WISE REGIONAL SALES QUANTITY AND REVENUE DISTN.

Regionwise GA Sales Details



Regionwise Revenue Distribution

