HERCULES BUSINESS REPORT

2021

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Team Members

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DECISION MAKING PROCESS

> **"It is often said that a wrong decision taken at the right time is better than a right decision taken at the wrong time."**
>
> **— Pearl Zhu.**

Identifying Goals and Rules:

We set the Y10Q4 goals:
Company value 25M
Sales value > 2m , **Profit** > 600 K.

Analysis :
By extrapolating the results of the regression analysis done with the data from Business growth and HPSU activity, following had been determined for each quarter and year before starting the game:

1. Production capacity
2. Premise space requirement.
3. Demand prediction
4. Sales channel visit
5. % of returns - Quality Control
6. Type of Location
7. Focus on Sales Channels
8. Focus on Production
9. Product Design
10. Product technology
11. R&D investment
12. Type of Production Unit.

Formula :

R&D investment- The decision was to invest 200 hours in the first quater and then an approximate 30% steady increase in each quarter. However, the exact investment was different, which was primarily in response to the market, competition and company's cash position.
Premise requirement ~ Number of cycles to be manufactured * 2
Quality control : Returns < 10%

SWOT Analysis:

Strength: of our company was always products with better specs than our competitors.
Weakness: Not being able to compete in all the segments with different products.
Opportunity: was to capture the market with significantly better product at a marginally high price which would make our organization more profitable.
Threat: was to maintain a competitive price for that segment and still be profitable.

Analysis:
1. Market Research - Competition
2. Market Research - Focus group
3. Market Research- Customer
4. Monitoring Demand

DECISION MAKING PROCESS

Made Decision on :

1. Pricing
2. Product Technology Level
3. Product Design
   - No of Components
   - Production time per unit
   - Design time
   - A score of product Specs (Speed, Comfort, Off-Road, Practicality and Weight)
4. Product Launch
5. R/D investment

Formula:

Max price of the product = Competitor price + Competitor Price * ((Sum of specs score of our product - Sum of specs score of competitor's product) / Sum of specs score of competitor's product)

Description:

Competitor's price + Appreciation of percentage difference in the overall specs score of our product in comparison to the competitor's product.

Quarterly Analysis:

Each quarter we carried out pre, post quarter analyses and compared them with our company's milestones for that quarter.
Used Dolearnfinance and Excel.

Analysis:

1.CashFlow
2.Balance Sheet
3.Sales And Marketing - Product 1, 2, and 3 order count.
4.Sales and Marketing - Order value from Sales Channel (Export, Direct, Small, Large).
5.Profit/Loss Analysis
6.Employee Morale and Efficiency

Made Decisions on :

1. No. of products of each type.
2. No. of batches. (cash-in and Sales value analysis)
3. Supplier
4. Minimum components to order
5. Min components in stock
6. Sales Visit.
7. Debtors type (Aggressive, Firm, or Gentle)
8. No. of Promotions
9. Promotion Scale
10. Investor Search
11. Loans decision
12. Changes in Overdraft Limit.
13. Hiring decision (employee or contractor)
14. Training method of employee
15. Discount to Sales Channel
16. Overtime (no. of hours)
17. Paid/Unpaid Overtime.

Formula:

Min Price (if the company is selling only one design) =
Overall company Expense / Total No.of product produced
Min price (if the company is selling more than one design) =
(Overall Operations resource cost + no. of component per product* no. of products produced * cost of one component) / no .of product produced

DECISION MAKING PROCESS

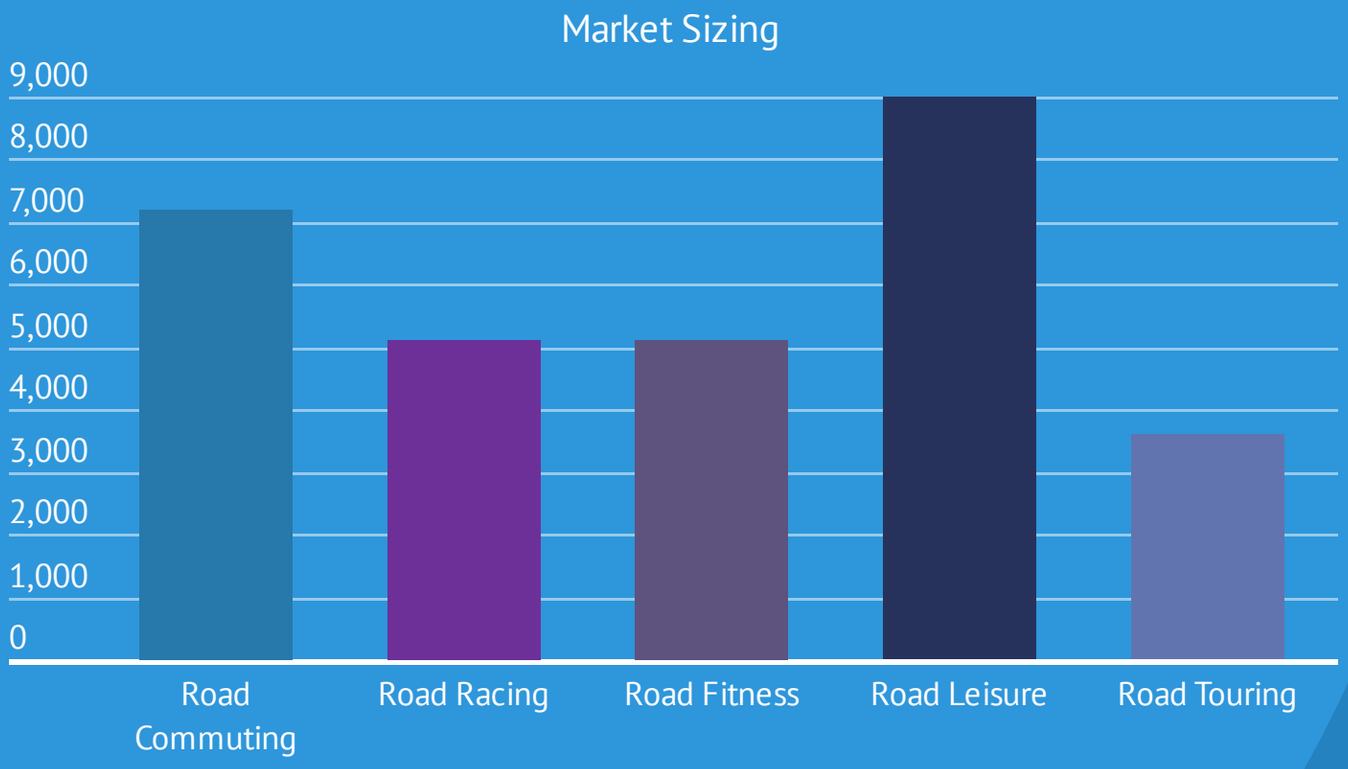
Market Sizing Analysis:

Before starting the game we did a market sizing analysis and product pricing analysis for each segment. This helped us in pre-determining the price range of the product for each segment and build products accordingly to reap maximum profitability. The following research data from the Business growth and HPSU was used to perform the aforementioned analysis.

1. Market Research - Competition.
2. Market Research - Focus group.
3. Market Research - Customer.

To make decisions on :

1. Pricing of the product in each segment.
2. Setting product technology level milestones.
3. Setting product design and launch milestones for each year:
   - No of Components
   - Production time.
4. Specs milestone (Speed, Comfort, Off-Road, Practicality, and Weight)



Product Pricing

Sr. No.	Segment	Price range per product
5	Road Touring	650 - 750
4	Stanford University	500 - 580
3	Road Fitness	650 - 700
2	Road Racing	780 - 850
1	Road Commuting	590 - 650

KEY DECISIONS, ACTIONS & STRATEGIES

R&D - Product Design strategy :

Our product design strategy was to sell only two product designs :
Product 1: Primary Focus - Road Commuting,
Secondary Focus - Road Fitness and Road Touring segment
Product 2: Focused Road Racing segment only.

Reason:

Designing one product with enhanced specs that could compete in three segments provided us a certain degree of flexibility in pricing which made our organization more profitable. We kept the product specs at par with the competitor or slightly better than the competitor in each segment so that the product is attractive for the customers of all three segments and we could sell the product at a slightly higher price than our competitors.
We were able to do this because we had invested heavily into R&D which enabled us to manufacture better products with lesser components which reduced our cost price of the product.
For the racing segment, we made a specific product because cycles in this segment require a very high number of components and were a very niche market.

Implications:

One product for 3 segments saved us time in R&D design time, we were able to capture commuting, racing, and touring segments with the same bike because of high specs, and attractive pricing.
Commuting was the biggest segment and we were able to sell cycles at a higher price than the competitor and thus be more profitable.

Product Launch Strategy:

Product 1: When the demand started getting stagnant we launched a new product for the commuting, touring, and fitness segment.
Product 2: New product in every 4-6 quarters.
The newer design was always either with betters specs or lesser components or both.

Reason:

Product 1: Generally, the stagnant demand for product 1 meant that the customers no more see our product as value for money, or the competitor has reduced his price significantly.
Product 2: The customers from this segment are needed better specs and want to upgrade their bikes regularly.

Implications:

We could always maintain the growth in demand. This design strategy coupled with our pricing strategy enabled our organization to constantly increasing sales value and profitability.

KEY DECISIONS, ACTIONS & STRATEGIES

Purchasing Strategy:

When the product demand was less than 200 we planned to buy the components from Harris(supplier) who had zero delivery time and provided a reasonable discount on fewer orders.
As our demand increased we went for bigger suppliers. Before moving to a new supplier, we predicted the demand for the next quarter and calculated the number of components needed each week.
We calculated and made sure that we had sufficient components in stock for manufacturing during the delivery delay we will experience by changing the supplier.

Reason:

We planned this strategy to avoid having a lot of extra components in stock after the quarter run.

Implications:

We never had any products in in-progress production after the quarter run. This strategic purchasing helped us to have optimal purchasing costs and maximize the profitability of the company.

Sales Channel Discount Strategy:

When approaching the sales channel we had a higher discount % (30%)
After acquiring all the sales channels and the company was established we reduced the discount rate marginally of the sales channel without losing the gained outlets.

Reason:

Initially, the discounts were kept higher to attract the sales channel.
Once the company was established we could retain the sales channel by the brand value and hence decided to the reduce the discount %.

Implications:
Even though, we were selling the products at a lower base price after Year 7 we could still make better sales value compared to previous years.
This also gave us the ability to sell the product at a competitive price without impacting our profitablity.

TIMELINE OF EVENTS

Y1Q1

- Completed design of Venom for Road Commuting
- Speed level 2

Y2Q1

- Secured new overdraft of £22k

Y2Q2

- Designed "Lightning" cycle with all specifications(Speed, comfort, etc) of Level2 with less number of components(from previous 32 to 25.9) and less time(From 11.5 to 9.4) due to which our profitability increased and cashflow become positive

Y3Q3

- £100k Crowd funding which let us invest in research and improve efficiency of employees due to which morale and company value increased substantially

Y4Q2

- Designed "Dominator" - Commuting segment cycle which resulted in 110% increase in order count

Y4Q3

- Transition to basic automation which improves our employees efficiency and increased sales profit from £90k to 290k

Y5Q1

- Entered into racing and all bike segments sale to improve market share of the company and company value raised to £2.1M from £1.2M

Y5Q2

- Planned to bring up national and export distributors to increase order value to £1M

TIMELINE OF EVENTS

Y5Q3

- Transition from basic automation to standard automation which increases company value to £3.6M

Y5Q4

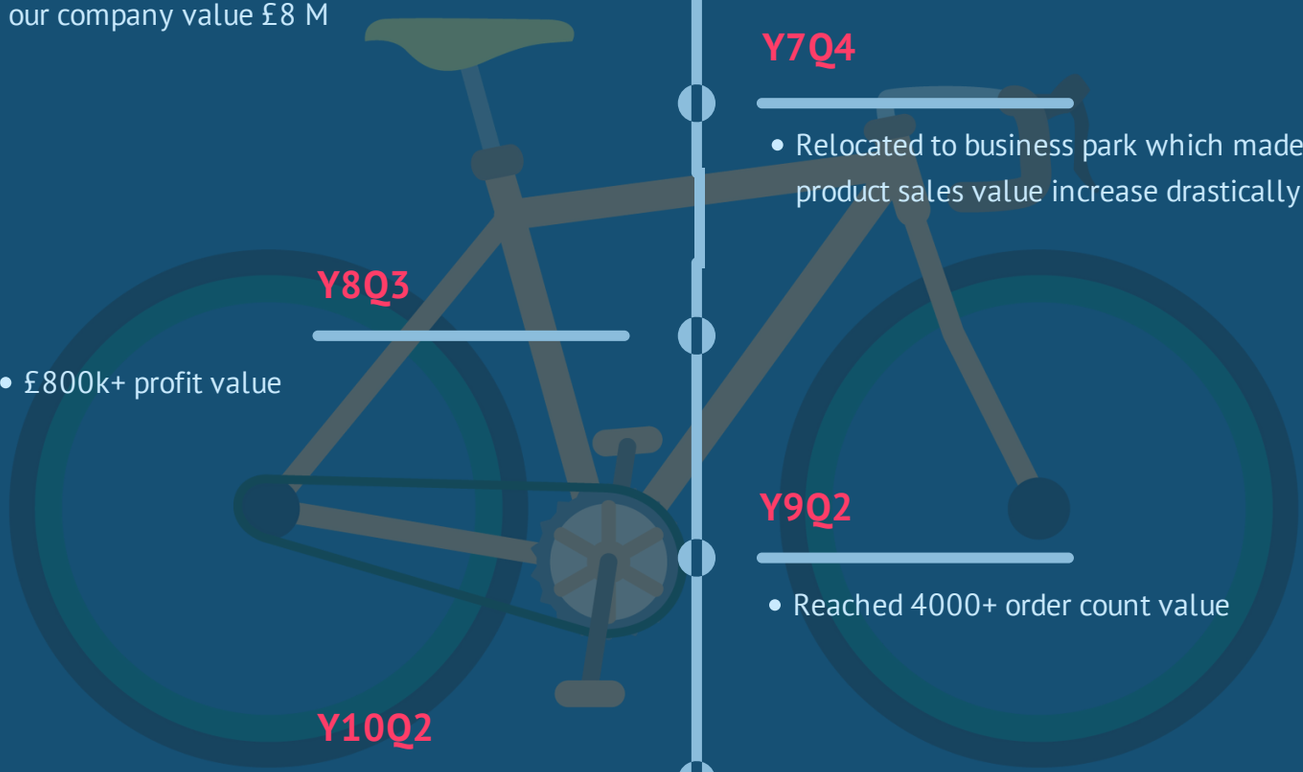
- Invested on promotion channels which help us in improving company value

Y7Q1

- Increased employees morale to 97%
- Got orders from all sales channels which make our company value £8 M

Y7Q4

- Relocated to business park which made our product sales value increase drastically



Y8Q3

- £800k+ profit value

Y9Q2

- Reached 4000+ order count value

Y10Q2

- Increased market share to 83%

Y10Q3

- Equity £7M for 31% share which decreased discounts for different retailers to 19% from 25% which make our company value ~ £25M

OUR LEARNINGS

Move to a better location only when the cash position is positive and stable.

Specification of the products should be given utmost importance to avoid competition among products between

Employees should be hired progressively foreseeing the demand.

Bank warnings should be taken very seriously.

Company's growth should be planned and slow transitions are easier to manage.

We cannot expect the company to be profitable in the early years.

Initial investment in R&D is important to ensure sustained profitability.

Contractors provide a lot of flexibility to the organization in the initial years, but are approx. twice as expensive as a full-time employee.

Whenever company's cash position is disturbed reduce your expenses to the minimum and try

Its better to invest in the sales visit of distributors only when the company has a steady production capacity of more than 1200 cycles.

When the company is established and the sales channels have been acquired reduce the discount to increase the profit margin.

In order to improve cash-in in each quarter produce cycles in higher batches especially during he initial years

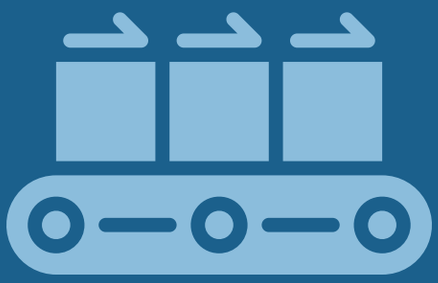
The product design should have a better balance between no of components and production time per unit to increase profitability.

In order to improve the market share and to understand the competition (pricing , score) do regular market research.

Ordering the required number of components during the initial years is very important to reduce expenditure.

IF WE HAD ANOTHER CHANCE, WE WOULD

External Manufacturer :



We as an organization wanted to create employment and focussed only on in-house production, which along with its various other benefits ensures superior quality, but is also slighty more expensive because the employees need to be trained and in some cases, if the demand has come down firing a full-time employee is very expensive, so in-house production lacks flexibility. But on the other hand, outsourced production though might appear very expensive initially but is highly profitable for the organization when the products are being produced in large quantities. So we would like to explore external manufacturers and see the diference in profits it brings for our organization.

Employees Morale & Efficiency :

In the initial years because of the company's cash position we had to make the employees do overtime without any extra payment, this impacted the organization's overall morale and efficiency. We would avoid doing the following things:
1. No overtime or at least paid overtime.
2. Regular training of employees in all departments.
3. Reduction in inter-departmental use of employees' efforts.
Even though we correctly predicted the space requirement of the employees and the equipment, but our late focus on the aforementioned aspects of the simulation led to decreased employee efficiency.

Location :

After analyzing the current seed to scale results, we noticed that changing the location to Business Park helped in increasing:
1. The demand of the product.
2. Value of the product.
Both these factors contributed to the steady increase in sales value.
With the budget, cash flow, and premise planning of the current game we couldn't make a move to Retail Park.
We would plan to change our location to a Retail park and see how does it affect our sales value.

FINANCIAL OUTPUTS IMPACT ON THE FIRM

- The primary indicator of the financial health of a firm is positive cash flow. Positive cash flow improves the working capital, which is then helpful in expanding and enhancing the existing production infrastructure and the related features.
- The expenditure should be kept to the minimum to improve profitability.
- Cash-in Cash-out difference needs to be monitored throughout the business to ensure a healthy ratio between the two.
- Initially, even a small delay in payment by the debtors can be troublesome for the company, and health maintaining a healthy financial relationship with the debtors is important for the business.
- We used a firm credit control strategy initially to ensure we had enough working capital to execute our strategies.
- Manufacturing and selling products at a good profit margin are crucial for the company's cash position and net profit.

HOW THE BOARD OF DIRECTORS MANAGED THE COMPANY OVER THE PERIOD

- The decision-making process was data-driven and evidence-based. The board of directors used quantitative analysis and their experience from the individual activities. Any idea was analyzed using data from the previous activities, especially Business Growth Activity because we could go there and validate our ideas before implementing it in the final competition.
- Our company had a rigid no-fire policy in the operations department.
- We decided to grow our R&D department only to a certain level and then dissolve the department to reduce the financial investment on that department. This strategic investment in R&D played a key role in making our products more profitable for us.

WORKING AS A VIRTUAL TEAM

Virtual connectivity is the new normal post-Covid. Virtual decision-making was the toughest part of the whole process as every single decision was made after brainstorming and team discussions. And resolving decisional conflicts virtually was a bit difficult but we managed to do so using different analysis tools like decision tree, Pareto analysis, etc. We used the Miro board usually for brainstorming over our assigned task which made our lives more simplified as everyone was efficient and could effectively put up their thoughts to the board which helped us a lot in making our company profitable. Running a virtual team is easier than that of an offline one as there is no barrier of location or time and let us explore a wide variety of options out there to make ourselves competent enough to express and explore what we think.

Technology is the future: Optimum utilization of software resources :
Our team made the best possible use of technology to achieve our team goals. We used the Miro board for brainstorming and decision making, along with excel and R studio for analytics. We made our report using Prezi software and uploaded our key decision charters and other documents on OneDrive. We also carried out regression analysis using R to analyze the statistical significance of different parameters on company value, sales value, order count, etc.

Task allocation :
All the team members were given specific areas of the business to analyze and then the insights from these individual analyses were then discussed by the board and to make business decisions. Excel and Google Data Studio were helpful in explaining numbers via charts and helpful visualizations.

Team Communication :
We used Microsoft teams as our primary communication channel which helped us in conducting our meetings in a timely manner and in keeping everyone at pace with the progress. We capture minutes of meetings and recorded the sessions as well to look back and verify our decisions and to analyze our strategy and thinking at that point in time while making decisions to avoid doing the same mistakes in the future.

Individual Excellence :
Each team member worked to the best of his/her ability to meet the set milestones. Everyone brought different areas of expertise to the table some in technology, others in finance, and some in the decision-making process. Virtual setup lets us bring out the best in us with the help of technology and a more lively virtual team environment. The virtual setup gave us the freedom to work at our own pace and comfort, with scope for exploring new approaches and, strategies for the betterment of our company.

DEALING WITH FAILURES

Failure :

In HPSU, our understanding of the KPIs was wrong, we were of the understanding that Y4Q4 numbers will be considered and not the entire year. This was a small mistake from our end, which we rectified in the next activity.

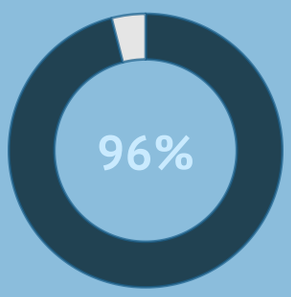
Bounce back from failure:

In the seed to scale activity we had set the KPIs as our bench mark and made strategies and decisions to achieve those. Our goals and milestones were in alignment to achieving our KPIs , in this way we never lost track of our goals.

Inevitable circumstances:

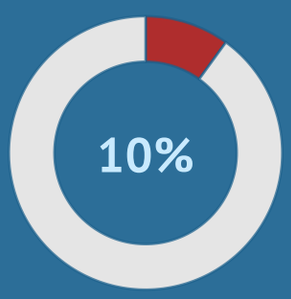
In the head-to-head competition, our competitors sold their bikes at a very cheap rate which was not profitable. We also got caught up in the selling loop and as a result, our company went bankrupt. We could have waited and stuck with our strategy instead of following the market and trying to compete at an unprofitable price. In such situations it is important to trust your strategy and follow it, even if you are not getting the desired results at that time..

HERCULES IN NUMBERS



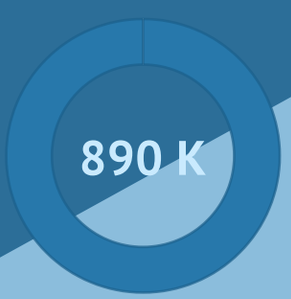
Demand Prediction Rate

Company Value

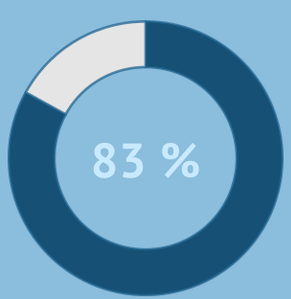


Product return was always less than 10%

Sales Values



Net Profit



Market Share

HERCULES IN NUMBERS

Demand Prediction Rate

The company's average demand prediction rate of the company remained was 96% primarily because of the regression analysis done prior to running the quarter.

Company Value

The Company value increased by 48%. This clearly shows increase in the brand value of the company but at the same time we need to concentrate on increasing stakeholder satisfaction by giving them dividend.

Product Returned Rate

Product returned rate in the last quarter was 8.25% of the total sales. The returns were lower than our set milestone, we aim to further reduce this to 5% in the next year, to improve brand value and customer experience.

Market Share

Hercules acquired 83% of the overall market share. Though this is a fairly good market share we plan to further expand in the Road Leisure section.

Sales Value

The sales value of Hercules was >2m by selling 4289 products. Even though our sales value increased by 12.5% in comparison to Y10Q2 we had 638 products in stocks. Hence, to attain higher sales count instead of spending hours on sales visit we need to focus more on the product promotions.

Net Profit

Net Profit of ~900K. This quarter we had a better cash flow and net profit value but by analyzing our performance we could have been better by focusing on allocating more hours of the operation department to the quality control and by allocating the hours on promoting our products through the marketing department. This would have helped the company to attain more than 1m in net profit.

FUTURE OF HERCULES

Our ultimate goal is to reach 3M in sales value by the end of the upcoming year. The firm would need to come up with new innovative products to attract more customers. Also needs to invest more into upgrading the underline production units to improve the efficiency of the employees which in turn will help us in growing our business to a wider scale.

Research and Development :

We have planned to launch a new product in the market with high-end technology and specifications. Our primary focus will be on commuting, fitness, touring, and racing bike segments where we have already established ourselves very well. Our previous market stakes and customers feedback will help us expand our business to a much greater market. Our plan is to increase the product technology level of speed, comfort, and practicality to level 6 which will enable us to produce better bikes for our target markets at a cheaper price.

Sales and Marketing:

Once our new product is ready for the market we will heavily invest in appropriate branding and promotions. We will keep the price in accordance with the current competitor in each segment, as our product specifications will be the key to increase the customer base. We will also continue doing market research once our product stabilizes in the market to review customers' feedback about the product using customer research and focus group research which will ensure we are en route to our milestone.

Organization:

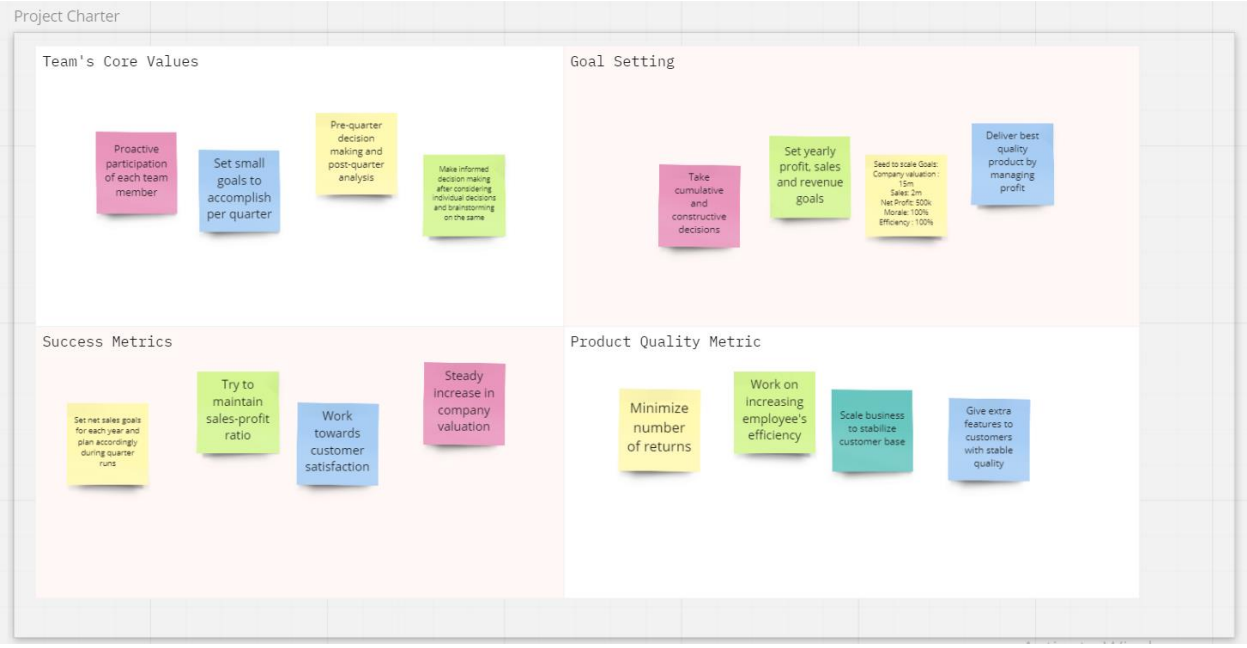
As we have planned to increase our sales to 3M till the end of next year we will also need to fulfill the space requirements according to the planned production. We will relocate from business park to retail park to increase employees morale and help in facilitating our daily business operations with more ease. We will keep our credit control policy to be gentle to ensure good business relations with our debtors.

Operations:

As we are designing a new product we will make some adjustments in our operations plan according to existing and newly added products and their respective demand. An increase in production will need more employees which in turn points towards maintaining their efficiency. We would move towards advanced automation to increase production capacity. We would also keep track of our product returns simultaneously to make sure we are delivering the highest quality product to the customers. We would also keep a record of our production cost at regular intervals to maintain to ensure our profitability.

Appendix A – Team Charter

Team Core Values , Goals Setting , Success Matrix and Product Quality Matrix



Appendix B– Company Value Regression Analysis

Analyzing the impact of sales count, sales value, order count, order value, morale, efficiency, shareholder satisfaction, premise expenditure, credit expenditure, purchasing expenditure, organization expenditure, quality check expenditure, logistics expenditure, operation resource expenditure, operations expenditure, product technology expenditure, promotion expenditure, sales channel expenditure, sales resource expenditure, sales marketing expenditure on company valuation.

```
Call:
lm(formula = company_valuation ~ sales_count + sales_value +
    order_count + order_value + morale + efficiency + sh_satisfaction +
    prem_exp + borr_exp + cred_exp + purchasing_exp + org_exp +
    qc_exp + logistics_exp + op_resource_exp + operations_exp +
    prod_tech_exp + prom_exp + sales_chan_exp + sales_resource_exp +
    sales_mrktng_enp, data = csv_data)

Residuals:
     Min       1Q   Median       3Q      Max
-1237819  -173765    -3904   163603  1920884

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)         3.904e+03  2.059e+05   0.019  0.98500
sales_count        -6.249e+04  3.897e+04  -1.604  0.11962
sales_value         1.334e+02  8.160e+01   1.635  0.11282
order_count         4.240e+04  3.591e+04   1.180  0.24740
order_value        -8.754e+01  7.458e+01  -1.174  0.25005
morale              4.954e+06  3.162e+06   1.567  0.12798
efficiency         -5.285e+06  4.167e+06  -1.268  0.21486
sh_satisfaction    -1.538e+06  1.237e+06  -1.243  0.22376
prem_exp           -3.253e+02  1.102e+02  -2.951  0.00622 **
borr_exp           -9.696e+02  4.857e+02  -1.996  0.05535 .
cred_exp            6.427e+03  3.466e+03   1.854  0.07395 .
purchasing_exp      1.323e+01  5.937e+00   2.229  0.03373 *
org_exp             3.179e+02  1.094e+02   2.906  0.00694 **
qc_exp              1.731e+02  1.444e+02   1.199  0.24027
logistics_exp       9.698e+00  3.259e+01   0.298  0.76819
op_resource_exp    -2.348e+01  1.434e+01  -1.637  0.11251
operations_exp     -4.607e-01  1.182e+00  -0.390  0.69960
prod_tech_exp      -5.005e+01  4.833e+01  -1.036  0.30897
prom_exp            8.851e+01  1.044e+02   0.848  0.40355
sales_chan_exp     -4.611e+01  9.588e+01  -0.481  0.63420
sales_resource_exp -1.080e+02  1.277e+02  -0.845  0.40486
sales_mrktng_enp   -4.017e+01  1.052e+02  -0.382  0.70526
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 713400 on 29 degrees of freedom
Multiple R-squared:  0.9847,    Adjusted R-squared:  0.9736
F-statistic: 88.75 on 21 and 29 DF,  p-value: < 2.2e-16
```

Appendix C - Company Valuation Regression Analysis using significant variables

Analyze the influence of sales count, sales value, order count, order value, morale and efficiency on company valuation.

```
Analyzing the influence of sales count, sales value, order count, order value, morale and efficiency on company valuation.
```{r}
pred_model_1 = lm(company_valuation ~ sales_count + sales_value + order_count + order_value +
                    morale+efficiency, csv_data)
summary(pred_model_1)
```
```

```
Call:
lm(formula = company_valuation ~ sales_count + sales_value +
    order_count + order_value + morale + efficiency, data = csv_data)

Residuals:
     Min       1Q   Median       3Q      Max
-4600634  -610794    47443   379562  7793136

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -4.744e+04  6.402e+05  -0.074   0.9413
sales_count  8.273e+04  4.622e+04   1.790   0.0804 .
sales_value -1.650e+02  9.503e+01  -1.736   0.0895 .
order_count -6.482e+04  4.349e+04  -1.490   0.1433
order_value  1.346e+02  8.942e+01   1.505   0.1395
morale       7.693e+06  4.796e+06   1.604   0.1159
efficiency  -9.902e+06  5.472e+06  -1.810   0.0772 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2219000 on 44 degrees of freedom
Multiple R-squared:  0.7751,    Adjusted R-squared:  0.7444
F-statistic: 25.27 on 6 and 44 DF,  p-value: 9.439e-13
```

Appendix D - Order Count - Regression Analysis

Analyzing the impact of sales channel expenditure, sales marketing expenditure and sales resource expenditure on driving demand i.e. increasing order count.

```
Call:
lm(formula = order_count ~ sales_chan_exp + sales_mrktng_enp +
    sales_resource_exp, data = csv_data)

Residuals:
     Min       1Q   Median       3Q      Max
-1199.10  -180.67   -16.08   209.67   965.46

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       16.079606  81.723023   0.197    0.845
sales_chan_exp     0.033301   0.006017   5.534 1.35e-06 ***
sales_mrktng_enp   0.008941   0.001532   5.835 4.78e-07 ***
sales_resource_exp -0.013325   0.009025  -1.477    0.146
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

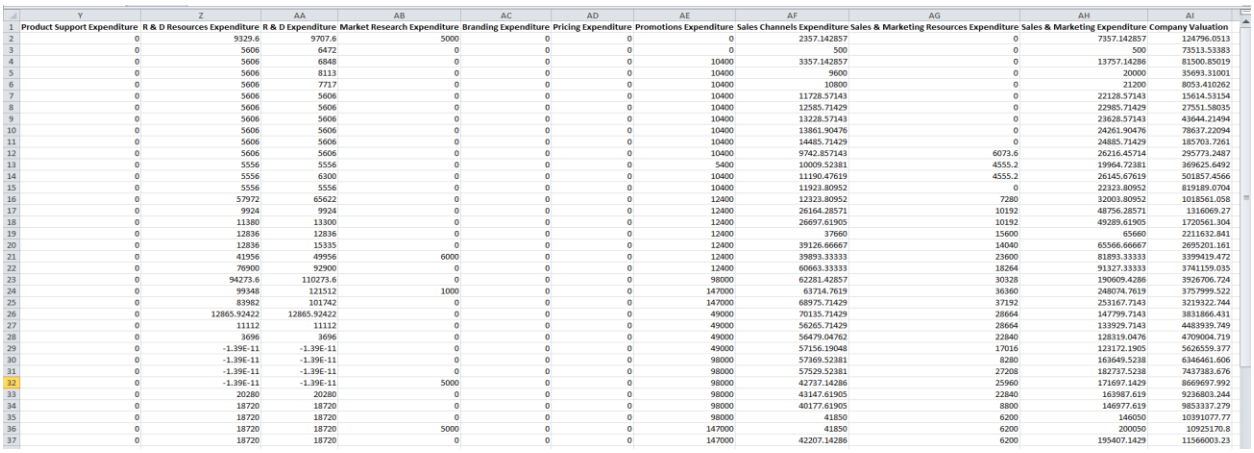
Residual standard error: 386.6 on 47 degrees of freedom
Multiple R-squared:  0.9284,    Adjusted R-squared:  0.9238
F-statistic: 203.1 on 3 and 47 DF,  p-value: < 2.2e-16
```

Appendix E - Data Used for Analysis

We imported the data from our first fill game run of the seed to scale activity for regression analysis.

Quarter	Cash	Sales Value	Order Value	Sales Count	Order Count	Morale	Efficiency	Shareholder Satisfaction	Premises Expenditure	Borrowing Expenditure	Policies Expenditure	Credit Control Expenditure	Equity Expenditure	Organisation Resources Expenditure
Y1Q1	283244.3661	0	0	0	0	0.93712	0.681800055	0.2946719	1197.5	200	0	0	0	0
Y1Q2	257535.4809	0	0	0	0	0.935088	0.706684399	0.295169565	1815.5	0	0	0	0	0
Y1Q3	213928.639	8450	8450	13	13	0.9403104	0.753680615	0.292594882	6655	0	0	0	0	0
Y1Q4	166311.6977	7605	7605	12	12	0.94448832	0.692040634	0.285727818	6655	0	0	0	0	0
Y2Q1	131411.6748	20992	68800	43	139	0.947830656	0.694861756	0.265730869	6655	0	0	1	0	0
Y2Q2	36002.60245	101696	101696	215	215	0.935881856	0.80445471	0.264057689	6655	0	0	11	0	0
Y2Q3	92801.19827	120640	155584	250	328	0.920826489	0.80583657	0.284897053	7513	0	0	12	0	0
Y2Q4	94268.59985	170473.5	194854.5	360	414	0.879693714	0.817529791	0.297737346	7513	0	0	183	0	1040
Y3Q1	36697.31271	229813.5	229813.5	488	488	0.823804877	0.808644655	0.958162496	8162.8	0	0	111	0	3432
Y3Q2	74744.6103	243487.5	243487.5	520	520	0.824263901	0.812385885	1	17075	0	0	135	0	1144
Y3Q3	137564.4469	212058	235158	441	491	0.818451869	0.806051021	1	17075	269.6575	0	138	0	1144
Y3Q4	206098.2326	199980	230670	420	486	0.80704598	0.80372163	0.994510967	17075	92.1775	0	114	0	1144
Y4Q1	244445.2471	243746	421564	500	877	0.814509196	0.807345426	0.982015883	17075	144.57	0	141	0	1144
Y4Q2	316481.5348	476772	476772	987	987	0.80211849	0.829324609	0.981861955	17075	233.685	0	108	0	3.18E-13
Y4Q3	414473.7888	512818	520322	1063	1079	0.795922024	0.789091153	0.973120063	17775.2	439.485	0	111	0	4461.6
Y4Q4	548476.7146	550271	550271	1139	1139	0.78	0.807664989	0.977554189	30735	0	0	144	0	3057.6
Y5Q1	535070.0888	697570	712700	1372	1397	0.875127273	0.798240352	0.980115604	31443.5	762.76	0	153	0	6115.2
Y5Q2	628070.7555	806008	829570	1584	1635	0.905684	0.800986846	0.961078624	51425	0	0	195	0	4680
Y5Q3	926856.779	758863	1050651	1489	2093	0.922910151	0.796221797	0.961133632	51425	0	0	294	0	4680
Y5Q4	1039071.196	1078688.5	1078688.5	2148	2148	0.929762319	0.787754978	0.959527653	60496.7	0	0	302	0	7800
Y6Q1	1343643.684	1201034.75	1205407.25	2306	2313	0.936488018	0.781848892	0.944159843	271680	0	0	307	0	6240
Y6Q2	1331959.224	1338447.5	1357487.5	2634	2674	0.932386591	0.776013411	0.922579872	272519.4	0	0	157	0	7800
Y6Q3	1300303.339	1426565	1480694.5	2800	2910	0.935903119	0.771282874	0.871170762	436600	2430	0	137	0	7800
Y6Q4	712437.6032	1393671	1484067	2724	2882	0.938716341	0.774062402	0.567794944	436600	2530.2275	0	160	0	7800
Y7Q1	1095312.157	1674238.5	1674238.5	3344	3344	0.956923632	0.797157485	0.593045	436600	0	0	166	0	7800
Y7Q2	1156542.348	1720755	1720755	3434	3434	0.96118335	0.812800434	0.651983923	436600	0	0	182	0	7800
Y7Q3	1678144.937	1472464.5	1472464.5	2904	2904	0.96739298	0.809295941	0.706263026	437404	0	0	186	0	9360
Y7Q4	2306863.694	1452398	1452398	2929	2929	0.968717143	0.809484125	0.901882631	121000	0	0	215	0	4680
Y8Q1	2890370.092	1373786.5	1441658.5	2760	2908	0.969776473	0.79502407	0.870637673	121000	0	0	187	0	0
Y8Q2	3245731.326	1655712	1708163	3434	3552	0.970623937	0.808766406	0.865550362	121000	0	0	181	0	7800
Y8Q3	3892243.704	1769370.9	1769370.9	3594	3594	0.971746014	0.809467569	0.904217826	121000	0	0	188	0	7800
Y8Q4	4399067.054	1457419.75	1457419.75	2928	2928	0.972292295	0.808461334	0.860362199	136600	0	0	173	0	7800
Y9Q1	5139282.024	1482367.5	1482367.5	2951	2951	0.97272932	0.798198839	0.831735756	136600	0	0	195	2428.571429	0
Y9Q2	5576204.145	1437043	1493743	2906	3026	0.976175714	0.81419553	0.765978805	136600	0	0	187	0	0
Y9Q3	5960256.441	1534468	1585970.5	3146	3255	0.97765541	0.800266091	0.691329286	136600	0	0	239	0	0
Y9Q4	6565362.944	1618458	1618458	3330	3330	0.978363315	0.806485698	0.682912461	136600	0	0	276	0	0

Organisation Expenditure	Purchasing Expenditure	Production Expenditure	Quality Control Expenditure	Logistics Expenditure	Operations Resources Expenditure	Operations Expenditure	Product Technology Expenditure	Product Design Expenditure	Product Support Expenditure	R & D Resources Expend
1397.5	2900	2.954910888	0	0	5450	8352.954911	378	0	0	9
1815.5	0	3.102656432	0	0	7415.4	7418.502656	866	0	0	
6655	10514	3.257789254	0	0	10556	21073.25779	1242	0	0	
6655	0	3.420678716	0	260	10556	10819.42068	2507	0	0	
6656	0	3.591712652	150	230	10556	10939.59171	2111	0	0	
6666	41121.2	302.3436633	150	520	33763.2	75856.74366	0	0	0	
7525	36056.2	9.843385821	650	2430	27429.6	66575.64339	0	0	0	
8736	60396.8	109.8194021	2300	2950	52140	117896.6194	0	0	0	
11705.8	98205	49690.89439	3400	4010	68083.4	223389.2944	0	0	0	
18354	82134.45	525	4800	5370	48114.8	140944.25	0	0	0	
18626.6575	81877.5	551.25	6250	5650	28542	122870.75	0	0	0	
18425.1775	64343.1	578.8125	5300	4830	39912	114963.9125	0	0	0	
18504.57	58569.45	607.753125	5750	4500	41472	110899.2031	744	0	0	
17416.685	174882.6	20595.17691	3050	5460	82646.2	286633.9769	0	0	0	
22787.285	149235.15	874.9100539	4650	10560	104836	270156.0601	7650	0	0	
33936.6	184208.4	918.6555566	7650	11340	96235.4	300352.4556	0	0	0	
38474.46	209858.5875	230881.1037	7100	12190	116222.2	576251.8912	1920	0	0	
56300	226500	31880.80112	8100	14480	136979.4	417940.2011	0	0	0	
56399	151000	2194.267971	8600	20590	118470.8	300855.068	2499	0	0	
68598.7	239043.75	152197.8395	9550	19430	182333.6	602555.1895	8000	0	0	
278227	244245	3461.597209	11800	30020	164416	453942.5972	16000	0	0	
280476.4	302000	33591.34225	15200	35650	203573	590014.3423	16000	0	0	94
446967	248692.5	63921.37815	16650	42960	202236	574459.8781	22164	0	0	
447090.2275	361958.75	1487299.763	12250	45860	189756	2097124.513	17760	0	0	
444566	302000	11340	10650	44770	195226.8	563986.8	0	0	0	12865.
444582	367910	211791.3762	10150	58480	205508	853839.3762	0	0	0	
446950	319321.25	13756.60551	11800	59171	220609.6	624658.4555	0	0	0	
125895	302000	14444.43579	12250	50785	205812	585291.4358	0	0	0	-1.3
121187	226500	15166.65757	10700	49524	205812	507702.6576	0	0	0	-1.3
128981	392646.25	15924.99045	11650	46530	213092	679843.2405	0	0	0	-1.3
128988	315541.25	16721.23998	10750	56881	218562.8	618456.29	0	0	0	-1.3
144573	354500	117241.9931	12150	62050	221564	767505.9931	0	0	0	
139223.5714	232552.5	19009.29743	13500	49867	220524	535452.7974	0	0	0	
136787	342702.5	19959.7623	11950	51333	220524	646469.2623	0	0	0	
136839	321968.75	20957.75041	12300	49981	220524	625731.5004	0	0	0	
136876	361366.25	22005.63793	11450	53284	220524	668629.8879	0	0	0	



	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	Product Support Expenditure	R & D Resources Expenditure	R & D Expenditure	Market Research Expenditure	Branding Expenditure	Pricing Expenditure	Promotions Expenditure	Sales Channels Expenditure	Sales & Marketing Resources Expenditure	Sales & Marketing Expenditure	Company Valuation
2	0	9329.6	9707.6	5000	0	0	0	2357.142857	0	7357.142857	124796.0513
3	0	5606	6472	0	0	0	0	500	0	500	73513.53383
4	0	5606	6848	0	0	0	10400	3357.142857	0	13757.14286	81500.85019
5	0	5606	8113	0	0	0	10400	9600	0	20000	35693.31001
6	0	5606	7717	0	0	0	10400	10800	0	21200	8053.410262
7	0	5606	5606	0	0	0	10400	11728.57143	0	22128.57143	15614.53154
8	0	5606	5606	0	0	0	10400	12585.71429	0	22985.71429	27551.58035
9	0	5606	5606	0	0	0	10400	13228.57143	0	23628.57143	43644.21494
10	0	5606	5606	0	0	0	10400	13861.90476	0	24261.90476	78637.22094
11	0	5606	5606	0	0	0	10400	14485.71429	0	24885.71429	185703.7261
12	0	5606	5606	0	0	0	10400	9742.857143	6073.6	26216.45714	295773.2487
13	0	5556	5556	0	0	0	5400	10009.52381	4555.2	19964.72381	369625.6492
14	0	5556	6300	0	0	0	10400	11190.47619	4555.2	26145.67619	501857.4566
15	0	5556	5556	0	0	0	10400	11923.80952	0	22323.80952	819189.0704
16	0	57972	65622	0	0	0	12400	12323.80952	7280	32003.80952	1018561.058
17	0	9924	9924	0	0	0	12400	26164.28571	10192	48756.28571	1316069.27
18	0	11380	13300	0	0	0	12400	26697.61905	10192	49289.61905	1720561.304
19	0	12836	12836	0	0	0	12400	37660	15600	65660	2211632.841
20	0	12836	15335	0	0	0	12400	39126.66667	14040	65566.66667	2695201.161
21	0	41956	49956	6000	0	0	12400	39893.33333	23600	81893.33333	3399419.472
22	0	76900	92900	0	0	0	12400	60663.33333	18264	91327.33333	3741159.035
23	0	94273.6	110273.6	0	0	0	98000	62281.42857	30328	190609.4286	3926706.724
24	0	99348	121512	1000	0	0	147000	63714.7619	36360	248074.7619	3757999.522
25	0	83982	101742	0	0	0	147000	68975.71429	37192	253167.7143	3219322.744
26	0	12865.92422	12865.92422	0	0	0	49000	70135.71429	28664	147799.7143	3831866.431
27	0	11112	11112	0	0	0	49000	56265.71429	28664	133929.7143	4483939.749
28	0	3696	3696	0	0	0	49000	56479.04762	22840	128319.0476	4709004.719
29	0	-1.39E-11	-1.39E-11	0	0	0	49000	57156.19048	17016	123172.1905	5626559.377
30	0	-1.39E-11	-1.39E-11	0	0	0	98000	57369.52381	8280	163649.5238	6346461.606
31	0	-1.39E-11	-1.39E-11	0	0	0	98000	57529.52381	27208	182737.5238	7437383.676
32	0	-1.39E-11	-1.39E-11	5000	0	0	98000	42737.14286	25960	171697.1429	8669697.992
33	0	20280	20280	0	0	0	98000	43147.61905	22840	163987.619	9236803.244
34	0	18720	18720	0	0	0	98000	40177.61905	8800	146977.619	9853337.279
35	0	18720	18720	0	0	0	98000	41850	6200	146050	10391077.77
36	0	18720	18720	5000	0	0	147000	41850	6200	200050	10925170.8
37	0	18720	18720	0	0	0	147000	42207.14286	6200	195407.1429	11566003.23

Appendix F - Post-Game Data Analysis

We exported our last seed to scale data and analyzed the results of our decision making and strategy.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Quarter	Cash	Q-Q %change in cash	Company Valuation	Q-Q %change in company valuation	Sales Value	Q-Q %chnage in sales value	Order Value	Q-Q %change in order value	Demand prediction rate(percent)	R & D Time (in hours)	Premises Expenditure	Q-Q%change in premise expenditure
2	Y1Q1	163152.5204	0	151013.816	0	0	0	0	0		646	1197.5	0
3	Y1Q2	145786.7809	-10.64386831	106557.005	-29.43890262	0	0	0	0		776.3333333	1810.1	51.1565762
4	Y1Q3	122458.3267	-16.00176236	99884.1131	-6.262274646	8450	0	8450	0	100	576.3333333	4537.5	150.6767582
5	Y1Q4	96574.42178	-21.13690887	91055.209	-8.839147519	26187	209.9053254	26187	209.9053254	100	528.3333333	4537.5	0
6	Y2Q1	64024.68213	-33.70430705	65960.7786	-27.55957696	72240	175.862069	72240	175.862069	100	709.3333333	4537.5	0
7	Y2Q2	38124.73208	-40.45307089	52389.3629	-20.57497803	80173.5	10.98214286	80173.5	10.98214286	100	736.6666667	4537.5	0
8	Y2Q3	61448.29348	61.17698441	60639.0396	15.74685445	109972.5	37.16814159	109972.5	37.16814159	100	54	5163.9	13.80495868
9	Y2Q4	49059.80982	-20.16082621	42000.5261	-30.73682178	95008.5	-13.60703812	157702.5	43.40175953	60.24539877	172	15125	192.8987781
10	Y3Q1	28369.18906	-42.17427837	60625.3795	44.34433378	174601.5	83.77460964	211947	34.39672802	82.37979306	499	15125	0
11	Y3Q2	54691.31297	92.78419575	157213.16	159.3190526	245293.5	40.48762468	245293.5	15.73341449	100	25	15125	0
12	Y3Q3	185988.1465	240.0689001	302419.382	92.36263829	267159	8.914015251	267159	8.914015251	100	690	15125	0
13	Y3Q4	222691.3013	19.73413659	380722.512	25.89223279	283864.5	6.253017866	283864.5	6.253017866	100	1422	15790.4	4.399338843
14	Y4Q1	287525.9123	29.11411924	486627.833	27.81693164	306439.5	7.952738014	306439.5	7.952738014	100	1389	24200	53.25767555
15	Y4Q2	319185.8925	11.01117459	637931.571	31.09229019	322951.5	5.388339297	322951.5	5.388339297	100	657	24200	0
16	Y4Q3	333008.1687	4.330478411	817278.995	28.11389682	365715	13.24146195	679378.5	110.3654883	53.83081743	2163	24200	0
17	Y4Q4	384379.4386	15.42642935	1298786.12	58.91588116	698922	91.11111111	698922	2.876673312	100	601	24200	0
18	Y5Q1	809374.2962	110.5664911	2173652.62	67.36032136	777708.8	11.27260982	777708.75	11.27260982	100	859	24889.4	2.848760331
19	Y5Q2	923677.4447	14.122409	2460554.37	13.19906159	844203.8	8.550115966	844203.75	8.550115966	100	900	72600	191.6904385
20	Y5Q3	1098319.133	18.90721587	2889937.44	17.45066387	932279.8	10.43302639	1002733	18.77855316	92.97387739	2134	72600	0
21	Y5Q4	1461904.417	33.10379226	3615813.81	25.11737327	1106374	18.67403534	1108096	10.50758278	99.8445983	2146	72600	0
22	Y6Q1	1872302.073	28.07281041	4405284.14	21.83382137	1197282	8.216728701	1212521.75	9.423890168	98.74311533	2175	72600	0
23	Y6Q2	2328665.882	24.37447549	5318738.97	20.73543498	1364738	13.98632778	1364737.5	12.5536511	100	2167	73430.3	1.143663912
24	Y6Q3	2857726.164	22.71945863	6280783.1	18.08782375	1492327	9.348981031	1510407.55	10.6738512	98.80290588	1031	102850	40.06479614
25	Y6Q4	3573365.907	25.04227842	7194353.63	14.54548759	1522605	2.028922557	1522604.7	0.807540322	100	1640.666667	102850	0
26	Y7Q1	4254140.17	19.05134489	8152144.29	13.31308844	1608851	5.664408497	1608851.25	5.664408497	100	2365.666667	102850	0
27	Y7Q2	4793470.323	12.6777711	9011237.85	10.53825264	1660722	3.224055052	1660721.5	3.224055052	100	4222.666667	102850	0
28	Y7Q3	5486736.502	14.46271976	9417086.41	4.503804796	1425810	-14.1451321	1425810.25	-14.1451321	100	4559.666667	116110	12.89256198
29	Y7Q4	6057417.074	10.40109311	9833196.45	4.418670737	1368493	-4.020012481	1376692.5	-3.444900891	99.40436953	1643	116997.9	0.764705882
30	Y8Q1	6575639.375	8.555169538	10127187.4	2.98978047	1361091	-0.540850608	1581798	14.89842503	86.0470806	50	189050	61.58409681
31	Y8Q2	6183047.187	-5.970403268	10741103.1	6.062054588	1634422	20.08177631	1796499.25	13.5732407	90.97817603	24	189050	0
32	Y8Q3	6956872.918	12.51528102	11768987	9.569631222	1882688	15.18981707	1882688	4.797594544	100	0	189050	0
33	Y8Q4	7661936.429	10.13477635	12517576.9	6.36069903	1736220	-7.77971443	1736220.25	-7.77971443	100	0	189050	0
34	Y9Q1	8582816.342	12.01889264	13266365.1	5.981894245	1732458	-0.216677579	1732458.25	-0.216677579	100	0	189050	0
35	Y9Q2	9248335.105	7.754083701	14095760.3	6.251865157	1763693	1.80291502	1763693	1.80291502	100	0	189050	0
36	Y9Q3	9857061.998	6.582015958	14745808.1	4.61165415	1686585	-4.371962694	1748558	-0.858142545	96.45576526	1762	189050	0
37	Y9Q4	10243844.43	3.923911977	15286366.8	3.665846676	1744861	3.455266115	1744861	-0.211431362	100	963	189050	0
38	Y10Q1	10993022.51	7.313446428	16125311.8	5.48819131	1837220	5.293201006	1837220	5.293201006	100	6	189050	0
39	Y10Q2	11665938.58	6.121301702	16756879.3	3.916622101	1807111	-1.638821154	1807111.25	-1.638821154	100	0	189050	0
40	Y10Q3	19406085.61	66.34825795	24825135.3	48.14891725	2035120	12.61731673	2035120.2	12.61731673	100	0	189050	0