

SPANDAN 2019

the pulse of SFIMAR

STUDENT RESEARCH JOURNAL



RESEARCH-THE ROOT TO KNOWLEDGE

ST. FRANCIS INSTITUTE OF MANAGEMENT & RESEARCH

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Gate no. 5, Mt. Painsur, S.V.P. Road, Borivali (W), Mumbai 400103.

www.sfimar.org





Prayer of St. Francis of Assisi

Lord, make me an instrument of Thy Peace
Where there is hatred, let me sow Love.
Where there is injury, Pardon.
Where there is darkness, Light.
Where there is sadness, Joy.
Where there is doubt, Faith.
And where there is despair, Hope.

O, Divine Master, grant that
I may not so much seek
To be consoled as to console,
To be understood as to understand,
To be loved as to love.
For it is in giving that we receive,
It is in forgiving that we are pardoned,
And it is in dying, that we are born to Eternal Life.

ABOUT THE FOUNDER



Bro. Paulus Moritz
Founder of CMSF

St. Francis Group of Institutions are run by the Franciscan Missionary Brothers, an International Congregation headquartered at Borivali (West), Mumbai.

Rev. Brother Paulus Moritz of Germany started the Congregation of the Franciscan Brothers in the year 1901 with the vision of reaching out to the poor and the less privileged.

St. Francis Group of Institutions in Mumbai is a chain of Christian Minority Educational Institutions located in the western suburb of India's Financial Capital Mumbai. St. Francis Group of Institutions have today become a pride of Mumbai and India's most sought academic community for its focus on excellence in value based education and beneficial and educative extracurricular activities.

Today, after 117 years of its inception the Franciscan Brothers continue their commitment of training young minds and finding solutions to address tomorrow's challenges.



ABOUT US

The Congregation of Franciscan Brothers was established in Mumbai in 1908, and now has branches in over 84 centres in India and 22 centres abroad in various Asian, European, American and African countries. The Congregation's main purpose is to render service to all strata of humanity especially the vulnerable sections of the society in order to empower them, help them, attain integral development and to live a free, dignified and truthful life.

St. Francis Institute of Management & Research (SFIMAR) was established in 2002 by "The Society of the Congregation of Franciscan Brothers"; to impart quality education in the field of Business Management (MMS/PGDM/MMM/MFM). It is recognized by AICTE, New Delhi and has been granted permanent affiliation by the University of Mumbai. It is also recognized under Section 2 (f) & 12 (B) of UGC Act 1956. SFIMAR is an ISO 9001:2015 Certified Institute and received Grade 'A' from the National Assessment and

Accreditation Council (NAAC) in 2016. It has won several accolades at National level such as 'Most Upcoming B-School' Award 2015 from ASSOCHAM, 'Best Educational Quality Enhancement Team' Award 2014 from National Centre for Quality Management. It has also earned recognition from the University of Mumbai's Department of Lifelong Learning and Extension for being the best participating B-School in Extension and Community Development Projects. SFIMAR is proud to be a part of the St. Francis Group of Institutions which is run by the Congregation of Franciscan Missionary Brothers having a 117-year old legacy of 'Service through Enterprise'.

At SFIMAR, we have leveraged the benefits of technology by building up an enviable storehouse of knowledge for our students through our on-going investments in pedagogical resources, a well-developed library as well as in IT solutions that speed up our student services and help us implement useful feedback from all

the stakeholders. Our students are aware of current issues and industry trends and have acquired advanced skills by participating in knowledge and skill enhancement programmes such as 'Thought Leader' and 'Lead by Example'. Students develop their leadership skills, improve their concentration, creative thinking and innovation and the ability to lead and mentor others. These are conducted through various Clubs such as Nirmiti (Marketing), Finatics (Finance), Prerna (Entrepreneurship), Institute Social Responsibility (ISR), Green- Environment, Mindfulness Training and Personality Development programmes. Our well-qualified and experienced faculty are supported by competent and dedicated programme coordinators and staff, who ensure that the programme delivery adheres to the Institute's strict quality, security and business continuity standards.

We focus on applied research and vital topics such as corporate social responsibility and governance, financial inclusion, investment strategy, asset allocation, digital marketing and so on. SFIMAR facilitates industry (management)-academia (student) interaction through its Eminent Speaker Series, Management Development Programmes, Regular Guest Lectures, Summer Xcellence and Prakalpa (project competitions), Alumni Connect etc. We run a number of certification programmes for our students to make them job-ready.

We also promote interaction between academic institutions through our Visiting Faculty Programme and the Annual Research

Conference 'Pathh' and 'Anveshi'. We have recently set up an Entrepreneurship and Business Incubation Zone (SFIMARebiz) to encourage self-employment and empower entrepreneurs to chart successful business ventures, by providing training, networking and cost-efficient solutions for setting up their businesses.

We have a consistent track record of 100% placement. We have started Corporate On-boarding Programme very successfully in which recruiters invest valuable resources in familiarizing our students with their organizational values, goals, roles, norms, and overall work environment. They also provide them job-specific training so that they have the necessary skills to get absorbed into their mainstream roles easily and become effective organizational members. This Corporate On-Boarding is a win-win programme for all, as it leads to positive outcomes for new employees, such as higher job satisfaction, better job performance, greater organizational commitment, reduction in occupational stress and intent to quit.

It is our constant endeavour at SFIMAR to bring up our students holistically with high moral values, ethical standards and an inclination towards societal good. Concepts such as compassion and stewardship are ingrained among our students so that they can adopt ethical business practices and build sustainable businesses. The Franciscan values continue to be a guiding beacon leading SFIMAR to higher standards in teaching, research and community service.

FOREWORD

SFIMAR's students research and project publication '**Spandan**' contains a series of select research work chosen over 200 projects conducted by our students in various fields of management during their summer internships.

These summer internships offer students a platform to work closely with professionals and to develop knowledge, competencies, and experience related directly to their career goals. The efforts taken by the students, their work supervisors from the organizations and the expert faculty guides from SFIMAR are taking it as a challenging task.

It has been our constant endeavor to maintain a strong relationship with industry which has helped our students to find suitable internships of their choice. We remain grateful to the organizations for their unfailing support in this regard.

Developing conceptual skills, Technical skills and Leadership skills is the objectives of Management education. Research, creativity and innovation are key elements of any higher education curricula and students need to develop these aspects, apply them in real-life situations so that they can adapt to the fast-changing nature of businesses and become successful managers or entrepreneurs in future. This Journal is an integral part of a broader research and project-based study agenda pursued at SFIMAR

Publishing a journal of this nature requires a lot of enthusiasm and strong involvement of various stakeholders. I thank all the student contributors, the Editorial Board, Student Editorial team,

faculty reviewers, staff and SFIMAR's library team for their commitment, patience and timely revisions, which led to the successful creation of this Issue. We are thankful to the organizations that provided SFIMAR the opportunity to partner with them on these assignments, and above all also appreciate our alumni who act as a constant catalyst in bringing out the best in our students.



The variety of subjects and diversity of ideas showcased in this Journal set the stage for subsequent Issues, where we hope to attract articles with more theoretical, experimental and analytical content. I am confident that our Institute's strong focus on research will help our students to build on these efforts and maintain this impressive trajectory over coming years.

I trust that this year's volume of **Spandan** serves as a platform that brings industry and academia, inquiring minds and new ideas together to bring innovative practices in the industry in particular and also contribute to the well being of the society at large.

Dr. D. Henry
Director - SFIMAR

EDITORIAL

Spandan is a student's research journal @ SFIMAR. Over the years, it has provided a platform to students to get recognition for their quality research work. SFIMAR has always put great emphasis on qualitative and quantitative research in various areas of management. Students with the help of faculty members have constantly tried to improve the standard of research work.

Spandan is managed by students under the guidance of senior faculty members right from the process of data collection to publishing and disseminating the copies. The editorial team works efficiently in the areas of content management and literature of the journal.

We are delighted to witness Spandan 2019 take its ultimate shape of distinctiveness. We express our gratitude to the members of the editorial board for their continuous involvement in the publication of the journal. We are grateful to the management for their unstinted assistance and support. We acknowledge the contributions of SFIMAR faculty members and the corporate guides that have aided the students towards the successful completion of their research projects.

Spandan 2019 Editorial Team

EDITORIAL BOARD



Prof. (Dr.) Simeon S Simon.
Associate Professor
Dept.: Marketing
Qualification: MBA, PhD
(E-mail: simeon@sfimar.org)



Prof. Pushkar Dilip Parulekar
Assistant Professor
Dept.: Finance
Qualification: B.E. (EXTC), MMS
(Finance), UGC- NET
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E-mail: pushkar@sfimar.org



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Dept.: General
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Email ID: venkat@sfimar.org



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Qualification: FCMA, M. Com.
(Banking and Finance),
PGDFM, MAH-SET (Commerce)
E-mail: shilpa.peswani@sfimar.org



Prof. Kiran Rodrigues
Assistant Professor
Dept.: Finance
Qualification: B.Com, MMS
(Finance), UGC-NET
E-mail: kiran@sfimar.org

STUDENT EDITORS



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Equity Research on Indian Two-Wheeler Companies

- Mr. Sagar Prathmesh Mehta
(MMS II – Finance)

Introduction:

The automobile sector is one of the most important sectors for investors in India due to its growth and future prospects. The S&P BSE Auto Index in the last 10 years has grown about 400% from 4934.06 points in June 2008 to 24,635.29 points in June 2018. As per the Society of Indian Automobile Manufacturer (SIAM), India is the largest two-wheeler market in the world, which overtook China in 2017. Additionally, as India is a consumption-driven economy and the majority of the population falls under the middle-income level, the demand for two-wheelers is predicted to increase. The entire two-wheeler market grew at 15% in FY2018, which is highest in the last 5 years. In the light of the above facts, this sector has great opportunity to grow in the future, and hence many investors would want to invest in these companies.

This study focuses on the two-wheeler market, as it enjoys the highest market share of 81% and is the leader of the Indian automobile market, owing to the growing middle class and a young population. Major companies in this segment are Hero Motocorp Ltd, Bajaj Auto Ltd, Honda Motors & Scooter India Pvt Ltd, TVS Motors Ltd, and Eicher Motors Ltd.

Equity research is conducted for the top three listed Indian two-wheeler companies: Hero Motocorp Ltd, Bajaj Auto Ltd, and TVS Motors Ltd. This report includes in-depth research of two-wheeler industry and detailed coverage of the above-mentioned companies.

The study analyses financial health and performance of these companies by using Altman Z score, Du-Pont analysis and Piotroski F score. The study also aims to find out the true and intrinsic value of the stocks of these companies by using discounted cash flow (DCF) method. It uses relative valuation technique to value the companies and has set target prices for the above stocks by assigning a forward PE multiple and provided a rating of buy, sell or hold.

Review of Literature

Shraddhanjali Panda (2010) used the discounted cash flow (DCF) model to value selected Indian companies from various sector to find out if discounted cash flow model can capture the market price. The intrinsic value was calculated for the 5 companies with appropriate discount rate. The paper concludes that the deviation from the market price of the intrinsic value of stock calculated by DCF was not significant; Thus with right assumption one can use this model.

Florein Steiger (2008), the research assesses the theoretical and practical approach of the discounted cash flow method. The paper says with proper assumption and appropriate discount rate, the discounted cash flow method can be very effective. The study enlighten us with the concepts of the discounted cash flow methods and also this paper help us perform a sensitivity analysis to understand the impact of input factors like WACC and terminal growth. Jan-Hendrik Markus Moh (2006), the research basically finds out the use of Piotroski F-score for making predictions about the growth stock. It

concludes that Piotroski F score is an important tool that can be used to separate growth stocks from others. However, the strategy to short stocks with low Piotroski F score has certain exceptions.

RohiniSajjan (2016), the research includes predicting the Bankruptcy of firms using Altman Z score. The study was conducted on six Indian companies to check the financial health of these companies. The research concludes that none of the companies analysed were in the safe zones as per the Altman Z score model. Most of the firms were in distress zones that indicate that these companies may go bankrupt in future.

Need for the Study:

As the Indian two-wheeler industry has a huge potential for future growth, it can be recognized as a lucrative segment for the investors. Thus, the need for the study is to fill the information gap in the minds of the investors and help them make a sound investment decision.

Objectives of the Study:

- To analyse the financial strength and performance of Hero Motocorp Ltd, Bajaj Auto Ltd and TVS Motors Company Ltd.
- To compute the intrinsic value of the stock of these three companies by discounted cash flow method.
- To determine the value of the above companies based on relative valuation technique
- To give target price for stocks of the above companies and give ratings of Buy, Sell or Hold for the shares of the above companies.

Research Methodology:

Three companies viz Hero Motocorp Ltd (1st), Bajaj Auto Ltd (4th) and TVS Motors Ltd (3rd) are selected as these three companies are listed and also have highest market share in the two-wheeler industry.

Data Collection & Analysis:

Secondary data was used for this study. It was collected from the annual reports of the respective company and also from authenticated websites like BSE & NSE. The data for the two-wheeler industry is taken from SIAM and CMIE research database.

Period of consideration of sample was from March 2008 to March 2018.

For Part I – Du-Pont Analysis, Piotroski F score and Altman Z score is used.

For Part II – Discounted Cash Flow method, Free cash flow to firm (FCFF) is used. Cost of Equity is calculated by using Capital Asset Pricing Model (CAPM), Beta is calculated using regression analysis, Sensitivity Analysis is done on WACC & Terminal Growth Rate.

For Part III – Operational Performance by comparing the Growth statistics, and Valuation based on EV and PE ratio

For Part IV–Target Price will be given by assigning a PE multiple to the company and Criteria.

Buy – The stock expected to deliver more than 10% return

Hold – The stock expected to deliver between -10% to 10% return

Sell – The stock expected to deliver less than -10% returns

Data Analysis:

Industry Analysis

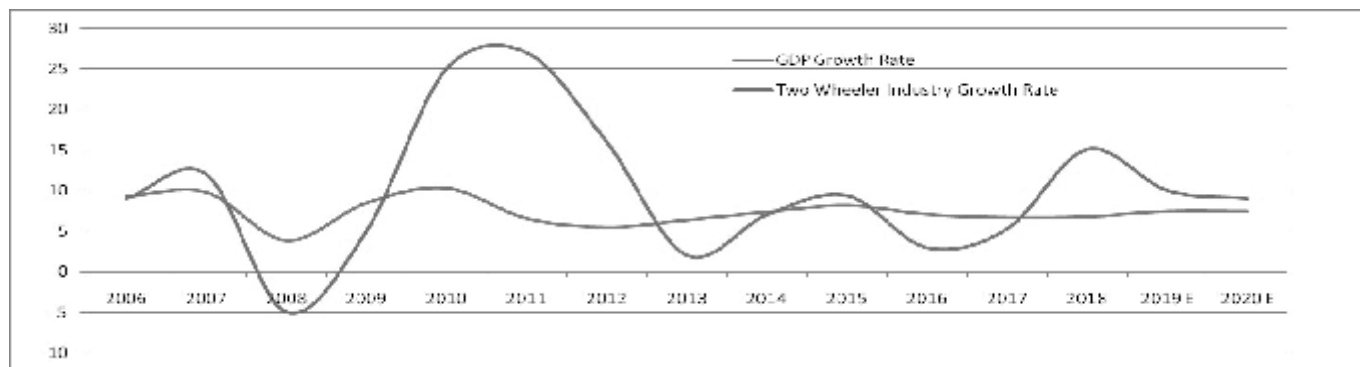
- The industry since March 1990 to March 2018 has grown at a Compounded Annual Growth Rate (CAGR) of 6.92%, However in the last 10 years the industry has grown at CAGR of 12.34%
- In the FY2017-18, the two-wheeler sales grew at 15%, which is the highest in the last 5 years.
- In FY2017-18, the market share of motorcycle

segment was 65.59%, scooter segment was 30.59% and mopeds segment was 3.82%, they grew at 15.07%, 19.27% and -3.07% respectively.

- The exports of two-wheelers from FY2012-13 to FY2017-18, has grown at 7.55% CAGR. In the last fiscal, the exports of two-

wheelers grew at 20.29%, which is also the highest growth rate registered in the last 6 years.

- The below graph compares the Gross Domestic Product (GDP) growth rate to Two Wheeler Industry growth rate.



- The major sub segment that contributes the most to the overall two-wheeler industry is the entry level motorcycle segment (75cc to 125cc) with 48.75% market share followed by 110cc to 125cc scooter segment with 30% market share.
- The sales of entry level motorcycle commuters are mostly seen in rural area. Thus, if the rural consumption rises and rural demand is high the entire two-wheeler sector grows significantly.
- The 110cc to 125cc scooter segment, 2nd highest contributor to the share in two-wheeler

market is growing at double digit rate since the last 5 years. It is outpacing the motorcycle segments and gaining more popularity.

- The next leg of the Indian two-wheeler market's 'Scooterisation' will come from the rural and semi-urban areas as the government expenditure on roads and infrastructure has increased. Thus, even for scooters the majority of the growth will be attributed to the rural consumption and rural demand.
- The below graph of rural output growth is compared with the two-wheeler industry growth rate



Source: Bloomberg Economics

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Growth (%)	15	12	-5	5	25	27	16	2	7	9.15	2.73	5.26	15.1

1. The Rural Output Growth has a significant impact on the sales of two wheelers.
2. There is a downward trend of Rural Output Growth from Feb-2008 to April-2009, if compared with the Two-wheeler Industry Growth Rate for the year 2008 (-5%), it shows that when rural output growth is low the sales of two-wheeler are significantly lower. It is to be noted that the impact is more as this was the year of subprime crisis. The entire world was in recession.
3. However, when the rural output growth started to show an upward trend (highest in last 14 years) from Nov-2009 till Aug-2011, the growth rate of two-wheeler industry was the highest in the year 2010 & 2011 at 25% and 27% respectively
4. While the Rural Output growth started to improve because of good monsoon, in FY2016-17, the government of India announced demonetization, due to which the

growth rate of the two-wheeler was low at just 5.26%.

5. Thus from the above analysis it can be concluded that there is a significant impact of rural demand on the two-wheeler sales.

Objective I- To analyse the financial strength and performance of Hero Motocorp Ltd, Bajaj Auto Ltd and TVS Motors Company Ltd.

DuPont Analysis

Return on Equity (ROE): (Net Profit Margin) x (Asset Turnover) x (Equity Multiplier)

Three step Du-Pont Analysis breaks down ROE into 3 components

1. Operating Efficiency – measured by net profit margin
2. Asset use efficiency – measured by asset turnover ratio
3. Financial leverage – measured by equity multiplier

3 STEP DU-PONT ANALYSIS

Year	Return on Equity	Net Income / Net Revenue	Revenue / Average Total Assets	Average Total Assets / Total Equity
	(ROE)	Net Profit Margin	Asset usage efficiency	Equity Multiplier
March'06	48.34%	11.15%	3.71	1.17
March'07	34.73%	8.67%	3.58	1.12
March'08	32.41%	9.37%	2.04	1.70
March'09	33.72%	10.40%	2.02	1.60
March'10	64.41%	14.16%	1.85	2.46
March'11	65.22%	9.80%	1.83	3.63
March'12	55.44%	9.93%	2.42	2.31
March'13	42.25%	8.90%	2.47	1.93
March'14	37.43%	8.33%	2.50	1.80
March'15	34.03%	9.12%	2.53	1.47
March'16	35.23%	10.94%	2.21	1.46
March'17	34.38%	12.40%	1.87	1.48
March'18	31.09%	11.47%	1.87	1.45

Piotroski F score

The Piotroski Scoring can be broken down into three components

1. Profitability
2. Leverage, Liquidity & Source of Funds
3. Operating Efficiency

Profitability Scoring		
Profitability Criteria		
Criteria	Points	
Particular	Positive / Higher than previous year	Negative/ Less than previous year
Net Income	1	0
Return on Assets	1	0
Operating Cash Flow	1	0
Quality Earnings (CFO > NI)	1	0

Leverage, Liquidity & Source of Funds Scoring

Leverage, Liquidity and Source of Funds Criteria	
Particular	Higher than previous year
Long Term Debt vs. Assets	0
Current Ratio	1
Equity Issued	0

Operating Efficiency Scoring

Operating Efficiency Criteria	
Particular	Higher than previous year
Gross Margin	1
Asset Turnover Ratio	1

Piotroski F score Hero Motocorp Ltd

Year	2013	2014	2015	2016	2017	2018
Piotroski 1: Net Income	1	1	1	1	1	1
Piotroski 2: Operating Cash Flow	1	1	1	1	1	1
Piotroski 3: Return on Assets	0	0	1	1	0	0
Piotroski 4: Quality of Earnings	0	1	1	1	1	1
Piotroski 5: LT Debt vs. Assets	0	1	1	0	0	1
Piotroski 6: Current Ratio	1	1	1	1	1	1
Piotroski 7: Shares Outstanding	1	1	1	1	1	1
Piotroski 8: Gross Margin	0	1	1	1	1	0
Piotroski 9: Asset Turnover	1	1	1	0	0	0
Piotroski F Score	5	8	9	7	6	6

Altman Z score

Altman Z score is used to measure the financial health of the company and also indicates the possibility of the company getting bankrupt in future.

$$Z \text{ score} = 1.2(X1) + 1.4(X2) + 3.3(X3) + 0.6(X4) + 1.0(X5)$$

X1 – Working Capital/Total Assets – Measures short term financial position of the company

X2 – Retained Earnings/Total Assets – Measures the leverage as to how much the

Company relies on retained earnings to finance their assets.

X3 - EBIT / Total Assets – This is used to gauge the real productivity of the company’s assets, as it measures the productivity independently of leverage and tax factors

X4 - Market Value of Equity / Total Liabilities – Measures how much the market value of company could decline before liabilities exceed assets

X5 - Net Sales / Total Assets – Measures sales generating capacity of the firm’s assets

Indicator	
Score	Interpretation
Less than 1.8	Distress Zone (high possibility of bankruptcy)
Between 1.8 – 2.9	Grey Zones (likely to go bankrupt in coming years, caution required)
Greater than 2.99	Safe Zone (financially sound)

Years	Working capital/Total assets	Retained earnings/ Total assets	EBIT/ Total assets	Market value of equity/Total liabilities	Net sales/ Total assets	Z score
2008	-0.18	0.10	0.28	7.27	2.04	7.25
2009	-0.17	0.13	0.29	9.54	2.02	8.70
2010	-0.23	0.10	0.33	7.68	1.85	7.43
2011	-0.02	0.09	0.23	4.12	1.83	5.15
2012	0.05	0.13	0.29	7.33	2.42	8.03
2013	0.09	0.13	0.22	7.26	2.47	7.84
2014	0.11	0.09	0.24	10.00	2.50	9.55
2015	0.20	0.06	0.27	15.39	2.53	12.98
2016	0.21	0.11	0.31	14.71	2.21	12.45
2017	0.22	0.10	0.27	13.05	1.87	10.98
2018	0.26	0.10	0.27	13.82	1.87	11.50

Objective II -To compute the intrinsic value of the stock of Hero Motocorp Ltd by using Discounted Cash Flow method

Forecasting

Income Statement & Balance Sheet of Hero Motocorp Ltd

Year to March	FY16	FY17	FY18	FY19 E	FY20 E	Fy21 E
Total Volume	66,32,152	66,64,046	75,87,193	83,45,912	90,97,044	98,24,808
% growth in Volume	0.01%	0.48%	13.85%	10.00%	9.00%	8.00%
Revenue from Operation	28,457	28,610	32,458	36,418	40,093	43,733
Material Cost	19,308	19,116	21,886	24,837	27,464	29,957
Employee Cost	1,339	1,432	1,584	1,821	2,005	2,296
Other Expenses	3,412	3,486	3,664	3,824	4,210	4,592
EBITDA	4,398	4,576	5,325	5,936	6,415	6,888
Depreciation & Amortization	443	502	575	618	699	803
EBIT	3,954	4,074	4,750	5,318	5,716	6,085
Other Income	413	522	523	536	547	558
Interest Expense	15	27	31	31	31	31
Profit Before Tax	4,353	4,568	5,242	5,823	6,232	6,612
Tax	1,275	1,339	1,570	1,764	1,888	2,003
Reported Profit	3,112	3,546	3,722	4,117	4,406	4,674
Shares/OS	19.97					
EPS	155.8	177.6	186.4	206.1	220.6	234.1

As on 31st March	FY16	FY17	FY18	FY19 E	FY20 E	FY21 E
Share Capital	39.94	39.94	39.94	39.94	39.94	39.94
Reserve & Surplus	8794.11	10275.57	11931.52	13610.98	15365.65	16751.62
Source of Funds	8834.05	10315.51	11971.46	13650.92	15405.59	16791.56
Net Block	3783.71	4598.85	4960.96	5578.958	6020.237	6260.803
Capital WIP	653.37	580.96	355.48	355.48	355.48	359.52
Cash & Equivalent	179.09	195.39	237.57	226.2504	414.1371	589.1776
Inventories	761.11	708.58	962.68	1059.94	1166.23	1253.08
Sundry Debtors	1282.07	1551.75	1426.97	1596.42	1757.50	1917.08
Loan & Advances	24.19	24.93	28.50	36.42	40.09	43.73
Other Current Assets	585.40	545.80	755.39	910.46	1102.55	1312.00
Trade Payable	2675.34	3266.20	3375.26	3587.48	3804.72	3926.31
Other Current Liabilities	812.18	870.41	1030.73	1311.06	1764.09	2624.00

Weighted Average Cost of Capital

Weighted Average Cost Of Capital = Cost Of Equity + Cost Of Debt

WACC Is Used As The Discount Rate For DCF

1. Cost of Equity

The Cost of Equity Will Be Calculated Using Capital Asset Pricing Model (CAPM)

Required Rate = Risk Free Rate + Beta (Risk Premium)

Risk Free Rate: 5.94%, Beta: 0.82

{10 Year Indian Government Bond Yield (7.89%)
– Default Spread (1.95%)}

Expected Market Return: 13.61% (Nifty Last 5 Year Returns)

Cost Of Equity –13.27%

Equity Weightage –98.38%

2. Cost of Debt

Market Rate – 5%, Tax Adjusted Rate – 3.50%,
Debt Weightage –1.62%

Weighted Average Cost of Capital: 12.08%

The Weighted Average Cost of Capital Will Change Based On Changes in the Debt & Equity Mix

Thus, the WACC for Fy20 Is 12.10% and Fy21 Is 12.11%

DISCOUNTED CASH FLOW

Particular	2018 P	2019 E	2020 E	2021 E
Sales	32458.37	36418.29	40092.90	43733.33
EBIT margin	14.63%	14.60%	14.26%	14.16%
FBIT	4750.07	5317.76	5716.05	6084.83
Debt	225.00	225.00	225.00	225.00
COC/WACC	0.13	12.08%	12.10%	12.11%
EBIT*(1-T)	3325.05	3722.43	4001.23	4259.38
Capital Expenditure	824.16	1200.00	1100.00	1000.00
Depreciation	574.98	618.42	698.81	803.17
Change in WC	-92.62	-49.84	-144.98	-452.77
FCFF	3168.49	3190.69	3745.03	4515.32
DF	1.00	1.12	1.26	1.41
PV of FCFF		2846.68	2980.51	3205.35
TV				71483.99

PV of Tv	50745.30
PV of FCFF	9032.54
Total value	59777.84
Net Debt	-12.57
equity value	59790.41
Per share Price	3004.54
Current Market Price	3458
Upside / (Downside)	-13.11%

Terminal Growth Rate is assumed to be 5%, discounted rate is WACC calculated above.

The current market price of the stock is Rs.3458, thus there is a 13.11% downside meaning the stock is overvalued.

- As per the Discounted Cash Flow method the intrinsic value of the stock of Hero MotoCorp Ltd should be Rs. 3004.54

SENSITIVITY ANALYSIS

	WACC					
	3004.54	10%	11%	12%	13%	14%
Terminal Growth	3%	2317	2296	2276	2255	2236
	4%	2566	2543	2520	2498	2476
	5%	3059	3032	3005	2978	2952
	6%	3308	3278	3249	3220	3192
	7%	3896	3861	3827	3793	3760

Similar process is followed for TVS Motors Ltd and Bajaj Auto Ltd

Findings and Interpretation:

Part I –

Company	Return on Equity	Piotroski F Score	Average F score	Altman Z score
Hero Motocorp	31.09%	6	6.83	11.5
Bajaj Auto Ltd	20.82%	5	5.5	12.36
TVS Motors Ltd	25.94%	5	6.1	3.14

- As seen from the table the financial performance of all the three companies has been good over the last 10 years.
- However, Hero Motocorp Ltd has a greater Return on Equity, F score as compared to other two companies.
- The Altman Z score for TVS is a concern as it is just over 3, the decrease in the Altman Z score is due to the excess debt the company has taken in the year 2018.

Part II –

Company	Intrinsic Value	Market Price	Upside/(Downside)
Hero Motocorp Ltd	3004.54	3458	-13.11%
Bajaj Auto Ltd	2454.91	2835	-13.41%
TVS Motors Ltd	404.83	556	-27.19%

- All the companies based on discounted cash flow method are overvalued.
- The downside is less for Bajaj Auto Ltd and highest for TVS Motors Ltd.
- This doesn't mean that one must short these stocks because perceptions and opinions about the market and the companies play an important role that influences the market price of the stock.

Part III –

Company	Revenue growth	EPS growth
Hero Motocorp Ltd	↓	↓
Bajaj Auto Ltd	↓	↓
TVS Motors Ltd	↑	↑

Company	EV/ EBITDA	P/E Ratio
Hero Motocorp Ltd	↓	↓
Bajaj Auto Ltd	↓	↓
TVS Motors Ltd	↑	↑

Company	EBITDA (%)	Net Profit (%)
Hero Motocorp Ltd	↑	↑
Bajaj Auto Ltd	↑	↑
TVS Motors Ltd	↓	↓

- The above table indicates that although growth ratios are low for Hero & Bajaj, they have better operative margins than the industry and despite that the valuation multiple is low than the industry

- Thus, Hero Motocorp and Bajaj Auto ltd are undervalued and TVS motors is overvalued.
 - Although, TVS is overvalued doesn't mean you should short the stock as they have good growth prospects

Part IV –

Company	Assigned PE	Forward EPS	Target Price	CMP	Return	Rating
Hero Motorcorp	18.5x	206.15	3813	3388	12.54%	Buy
Bajaj Auto	19x	156.56	2974	2692	10.44%	Buy
TVS Motors	34x	17.21	590	542	8.97%	Hold

Limitations:

- Forecast is based on assumptions.
 - Only 5 companies are considered for Relative Valuation.

the two-wheeler companies across the world.
 - The same valuation can be matched with Dividend discount model and results can be compared

Future Scope:

- The study can be extended to value companies across different sectors.
 - Relative Valuation can be done by taking all

Recommendations:

The study recommends investors to-
 Buy: Hero Motocorp Ltd & Bajaj Auto Ltd
 Hold: TVS Motors Company Ltd

Conclusion:

1. It is evident from the study that the historical financial performance & strength of all three companies selected has been above average based on the Piotroski F score, Altman Z score and Du-Pont Analysis. Thus, based on past performance these companies are favourable for the investors to invest as the return ratios are healthy
2. The true and intrinsic value of the three companies is less than the market value based on the discounted cash flow method. This concludes that these three companies are overvalued.
3. However, this doesn't mean that investors should not invest in these companies, when valued the above companies through relative valuation technique Hero Motocorp Ltd and Bajaj Auto Ltd is undervalued and TVS Motors Company Ltd is overvalued.

Books:

- Ashwath Damodaran 2006. Damodaran on Valuation: Security Analysis for Investment and Corporate Finance.
- Prasanna Chandra 2011. Security Analysis and Portfolio Management.
- Annual Reports of Hero Motocorp Ltd., Bajaj Auto Ltd., TVS Motors Company Ltd.
- Brokerage Reports of Ventura Securities Ltd.

Web Links:

- www.siamindia.com

- www.ibef.org
- www.worldbank.org
- www.investing.com
- www.bseindia.com
- www.nseindia.com
- www.auto.economicstimes.indiatimes.com

Data Base :

- Capitaline
- Center for Monitoring Indian Economy (CMIE)
- Bloomberg Terminal

References for Literature Review:

- Valuation of Selected Indian Stocks Using Discounted Cash Flow Technique, 2010, International Journal of Business and Management Invention
- Seminar Paper Fall 2008, The Validity of Company Valuation Using Discounted Cash Flow Methods
- Utility of Piotroski F-Score for predicting Growth Stock Returns, Münzenberger Straße 10 60389 Frankfurt
- PREDICTING BANKRUPTCY OF SELECTED FIRMS BY APPLYING ALTMAN'S ZSCORE MODEL, International Journal of Research Granthalay.

Acknowledgement:

I express my deepest gratitude to Dr. S.S Mohanty (faculty guide) , I would also like to acknowledge Prof. Pushkar Parulekar (Mentor) for their co-operation And inputs throughout the course of this project.

A Study on the Debt Management System and Working Capital Management at Indian Oil Corporation Limited

– Ms. Juelee Suresh Dalvi
(MMS II Finance)

Introduction:

Growth for any company demands a strong financial position to build and sustain itself. Company requires the current assets for day to day working of the unit. These current assets are considered as one of the major contributors in improving profitability of any organization. Looking at the importance of the Receivable management and working capital management, the project was aimed to assist the company to analyse its present efficiency in terms of managing the debtors and working capital.

The project started with understanding the company process and then analysing the relation between sales and debtors, and then reviewing the past financial performances and working capital efficiency with the help of ratio analysis. The next step was to see the operating cycles. The project also makes an endeavour to measure the degrees of associations between the measure of profitability i.e., ROE and the ratios relating to working capital management of the selected companies under study during the study period. Further the attempt had been made to examine the impact of working capital management on the corporate performance of the selected companies. The Bhattacharya model had been used to ascertain the working capital efficiency in the selected public sector oil and gas companies in India.

The analysis of correlation revealed both positive as well as negative associations between ROE and working capital ratios. The findings of paper

reveal that the companies can boost their performance in terms of profitability by managing working capital appropriately.

Need For Study:

Working Capital Management is a crucial task for every manager in an organization because it has a direct impact on the liquidity and profitability of an organization. Ineffective working capital management is considered as one of the important factors as it causes industrial sickness. An optimal level of working capital is necessary to an organization for survival in the market; therefore it is necessary to analyze the working capital of the company.

Corporate performance depends upon the efficient utilization of fixed assets, proper management of liquidity and judicious handling of investment opportunities, etc. Among these, efficient management of liquidity is of paramount important in enhancing the overall corporate performance and profitability. While inadequate amount of liquidity impairs the firm's operation, holding of excess liquidity results in the reduction of profitability. Therefore there was a need to analyze the relationship between liquidity and profitability of the selected public sector oil and gas companies in India.

Objectives of the Study:

- To understand the Trend of the Sales and Debtors of the Company and to find a relation between the two.

- To analyze the Working Capital of the Company.
- To analyze the Cash Conversion Cycle and the Liquidity of the Company.
- To find out the different Ratios related to Liquidity and Profitability of the Company and compare them with the competitors like HPCL and BPCL.
- To analyse the impact of liquidity on profitability of the selected public sector oil and gas companies in India.
- To assess the efficiency of working capital using Bhattacharya Model

Research Methodology:

The Research design used in the project is exploratory and descriptive, as it deals with the main aim of gaining the insights to deal with a problem or to find relevant conclusions through the financial statement analysis which is an exploratory research and also descriptive research as it aims at bringing light to the problems and describe the situation completely.

Data Collection:

The data collected is secondary data. The data was taken from the Annual Reports of all the six companies.

Statistical Tool:

Regression analysis had been done to find out the relationship between sales and debtors. For assessing the relationship between working capital and profitability simple co-relation coefficient (r) had been used. Bhattacharya Model had been used to analyze the efficiency of Working Capital Management.

Data Analysis:

Objective 1: To find the Trend of the Sales and Debtors of the Company and to find a relation between the two.

	IOCL	
Year	Sales	Debtors
2017-18	515,541.89	10,696.48
2016-17	348,631.65	8,899.19
2015-16	338,312.49	7,684.50
2014-15	432,272.96	7,644.77
2013-14	448,749.92	12,551.72
2012-13	405,994.18	12,499.51
2011-12	359,925.31	11,551.80
2010-11	284,543.85	7,684.62
2009-10	253,636.58	5,606.15
2008-09	288,750.61	4,781.73
2007-08	230,505.20	5,256.48

The above table shows the amount of sales and debtors over the last 11 years. On observing the table it can be said that sales has a positive relationship with debtors. Sales increases with an increase in debtors.

Regression Analysis has been done to analyze the relationship between sales and debtors of the company. For this purpose past 11 years sales and debtors has been taken into consideration.

H0: There is no significant relationship between debtors and sales.

H1: There is a significant relationship between debtors and sales.

Following are the results of Regression Test.

<i>Regression Statistics</i>	
Multiple R	0.75
R Square	0.56
Adjusted R Square	0.51
Standard Error	1987.08
Observations	11

ANOVA

	df	SS	MS	F	Significance F
Regression	1	45787521.64	45787521.64	11.59615302	0.007807352
Residual	9	35536586.48	3948509.609		
Total	10	81324108.12			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	51.253	2587.591	0.020	0.985	-5802.284	5904.790
Sales	0.024	0.007	3.405	0.008	0.008	0.040

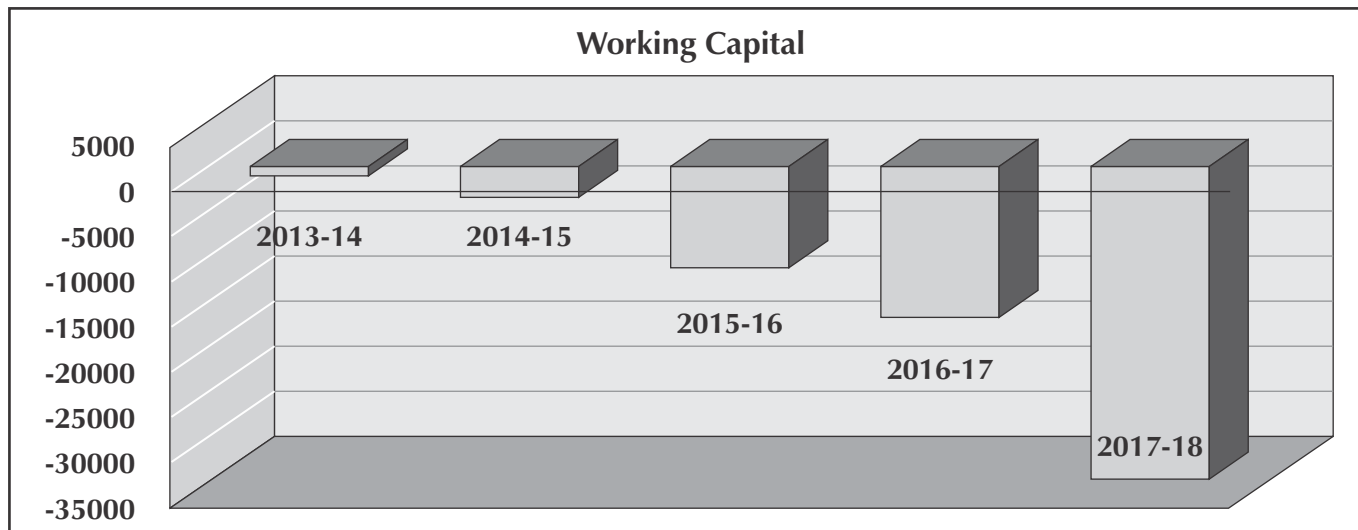
R value:
Sales and debtors are strongly co-related as coefficient of correlation i.e. R is greater than 0.75

Rsquare:
56.30% variability in sales is explained by the variability in debtors.

P Value: 0.0078
Since P value is greater than 0.05,
H1 is accepted.

Thus it can be said that there is a significant relationship between debtors and sales.
Also, F calculated is greater than F critical. (11.59 > 5.1174)
H1 is accepted.
To conclude it can be said that, the variation in Sales exist because there is a variation in Debtors.

Objective 2: To analyse the Working Capital of the Company.



On analyzing it was observed that the working capital of IOCL is negative for last 5 years. Over the last 5 years Current assets have decreased significantly, approximately by 25%. But, at the same time current liabilities have decreased only by 0.90%. The company is seen to be maintaining high level of inventory. For this purpose they borrow more

funds and keep it under provisions because of which their current liabilities are high as compared to current assets. Company oil is following aggressive working capital policy, the working capital of Indian oil is negative. IOCL maintains a low liquidity but at the same time it incurs a profit as profitability varies inversely with liquidity.

Objective 3: To analyze the Cash Conversion Cycle and the Liquidity of the Company.

IOCL					
	2017-18	2016-17	2015-16	2014-15	2013-14
Inventory Days	68.96	67.07	52.55	50.08	54.17
Receivable Days	6.71	8.29	7.69	7.72	9.38
Payable Days	33.84	32.02	32.89	30.96	28.21
Working Capital Cycle	41.82	43.34	27.34	26.84	35.33

- Company is seen to be having a Positive working capital cycle which shows that the company requires financing to cover the period of time before they receive payments from customers.
- It can be seen that the company takes time to recover the money from debtors. They are waiting too long for customers to pay them and are very lenient with their collection policy.
- Receivable days and payable days were

constant throughout the years. It was the change in Inventory days that caused the increase in working capital cycle. Inventory has increased due to the increase in consumption. The company is seen to be spending more on COGS.

Objective 4: To find out the different Ratios related to Liquidity and Profitability of the Company and compare them with the competitors like HPCL and BPCL.

Liquidity Ratios:

Working Capital Turnover Ratio (WCTR):

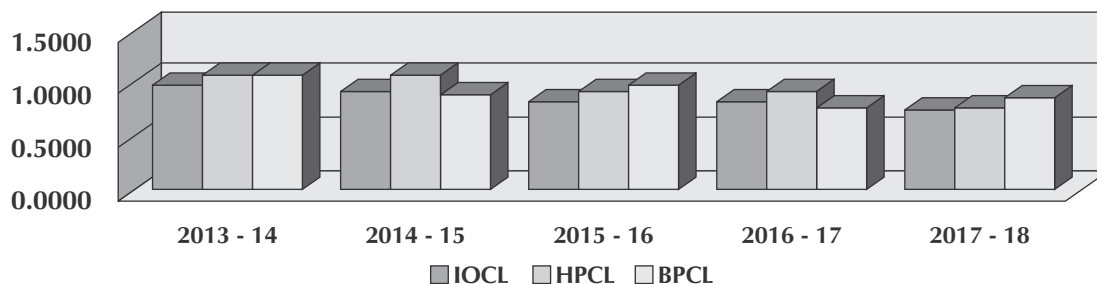
Working Capital Turnover Ratio	2017-18	2016-17	2015-16	2014-15	2013-14
IOCL	-15.08	-21.41	-31.67	-137.57	16194.51
HPCL	-24.03	-109.4	-121.33	77.52	60.91
BPCL	-54.55	-21.28	-276.16	-62.01	79.37

Working capital turnover ratios of all the three companies is negative. Till the year 2014 WCTR was positive but in the year 2014 there was a fall in the crude oil prices due to which the ratio

decreased drastically but after that it has increased. On comparing it can be seen that IOCL has highest working capital turnover ratio and are leaders in the sector with respect to WCTR.

Current Ratio:

Chart Title

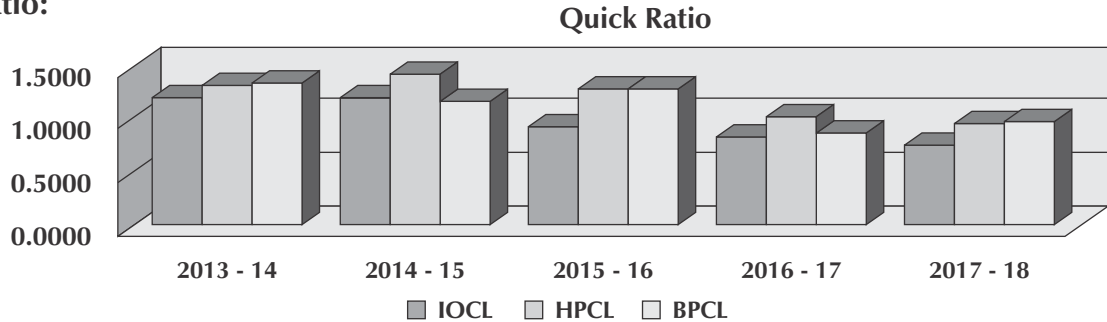


- The current liabilities and provisions has increased at a higher rate than the current assets. Thus there has been a decrease in the working capital of the company and the liquidity has decreased.
- In 2017-18, the Short term loans and advances have decreased by 62.15%, which

has resulted in the decrease of the Current Ratio.

Ratio of all the three companies has decreased over the period. But the ratio of IOCL has decreased by 32.38% in the last 5 years as compared to HPCL which has decreased by 38.07%. HPCL and BPCL have better liquidity position as compared to IOCL.

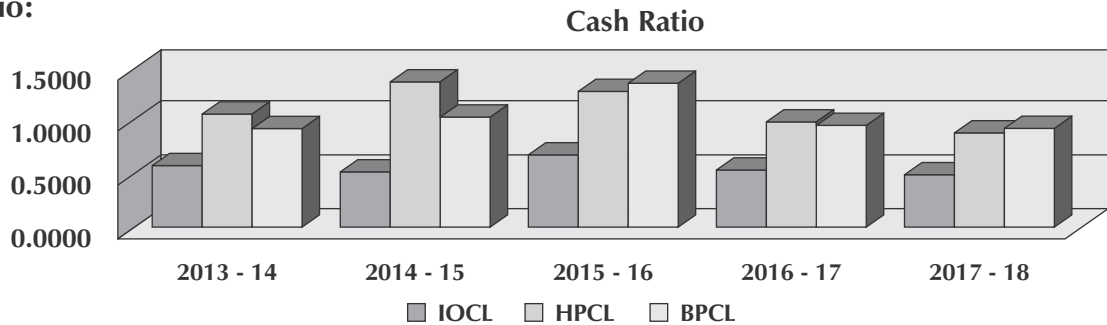
Quick Ratio:



- Quick Ratio is showing a decreasing Trend but it is decreasing at a slower rate than the Current Ratio.

In IOCL the quick ratios are comparatively lower than other companies in the oil sector.

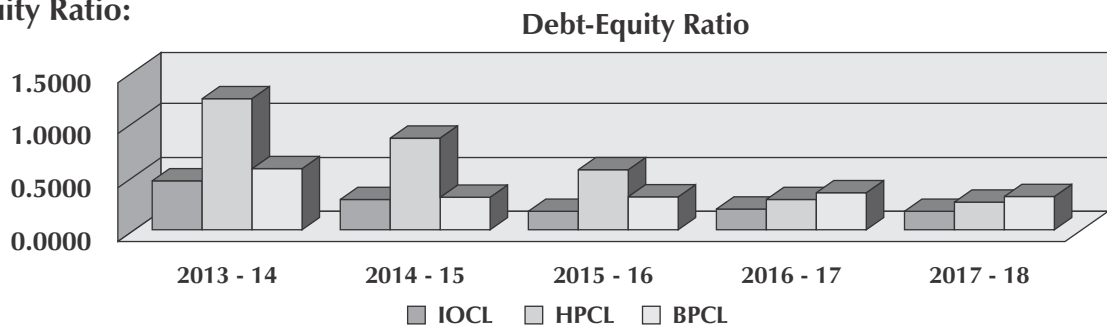
Cash Ratio:



From the graph it can be seen that there is need to maintain the cash reserve to meet the short term debt. It depends if the company wants to have a high or a low cash reserve. As the company deals

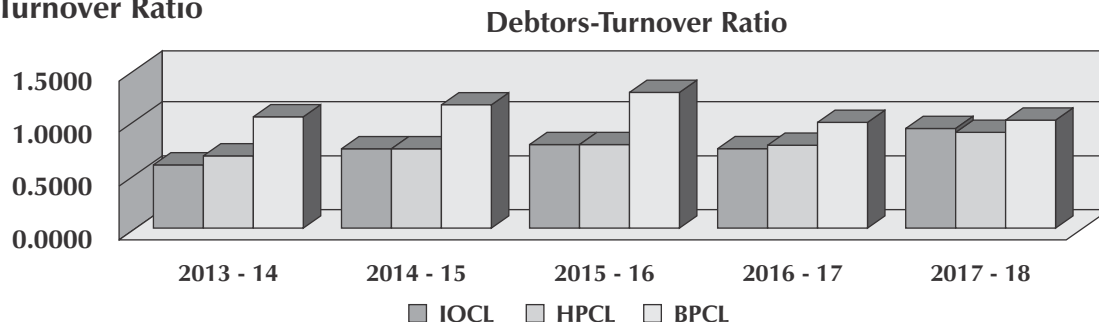
in the daily transaction it is advisable to have a high cash ratio. Cash ratio of HPCL and BPCL is better as compared to IOCL.

Debt-Equity Ratio:



- From the above table it is clear that the company has more owned capital as compared to the borrowed capital from the year 2014-15.
- The assets are financed more by the owned fund as compared to the borrowed funds as owned funds are more than 50%.

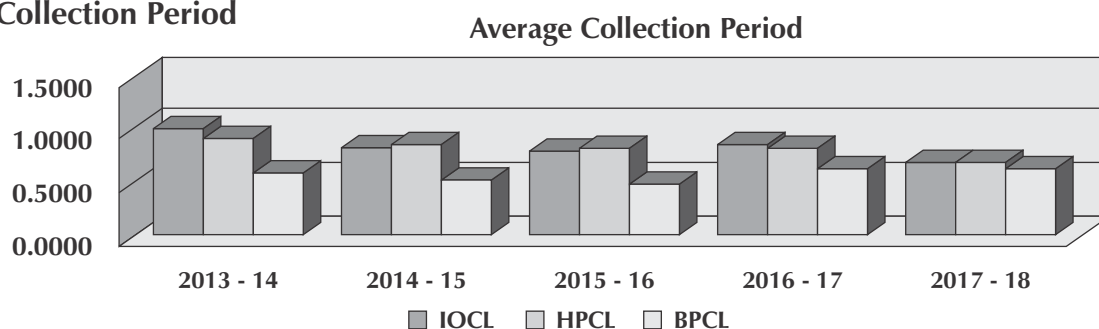
Debtors-Turnover Ratio



Debtor's turnover ratio of IOCL is in increasing trend due to the increase in debtors. Sundry Debtors are in increasing trend in the last four

years due to increase in credit periods given to the debtors. DTR of IOCL is more consistent than HPCL and BPCL.

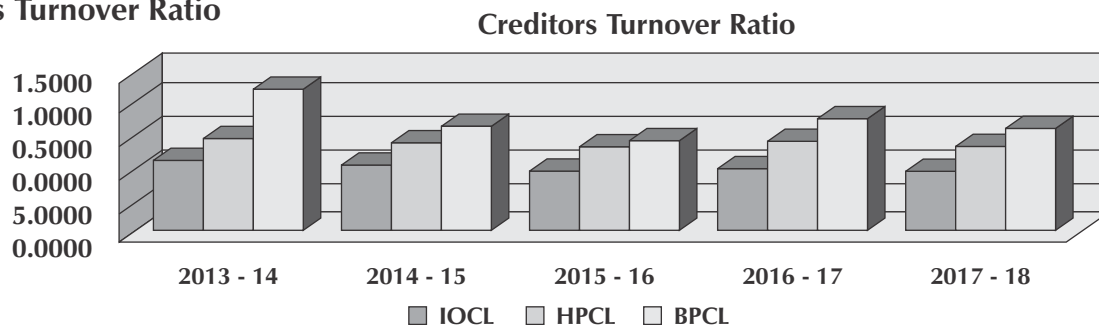
Average Collection Period



ACP of IOCL has decreased by approximately 14% in the last 5 years which shows that IOCL is not facing any problems because of the change in

collection policy. IOCL has had better collection policies than HPCL and BPCL.

Creditors Turnover Ratio

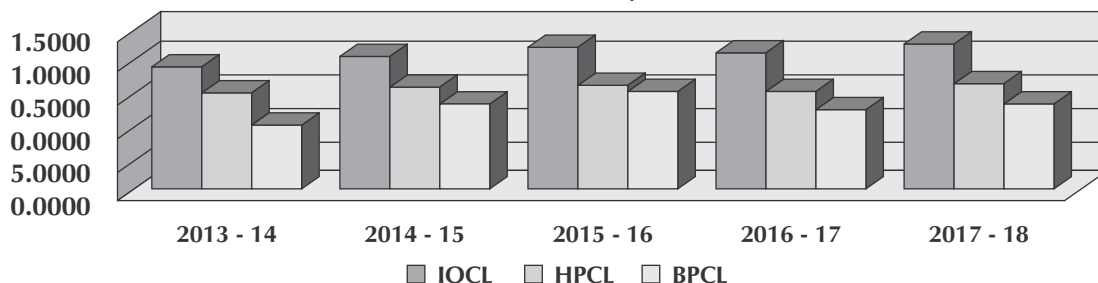


CTR of all the three companies have decreased over the last 5 years. Overall the CTR of IOCL is

lower than the other two companies which is a good sign for the company.

Average Payment Period:

Creditors Payment Period

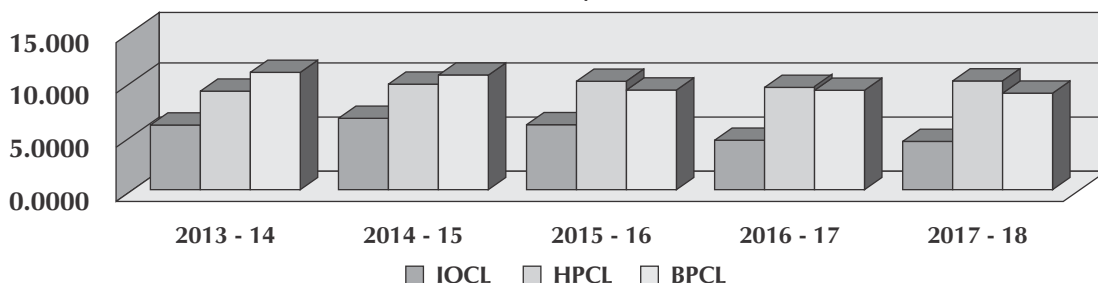


Creditors Payment period of IOCL is more as compare to the other two oil refining companies which is a positive sign.

It indicates that the company is utilising the amount for more period as compared to the other two companies.

Inventory Turnover Ratio:

Inventory Turnover Ratio



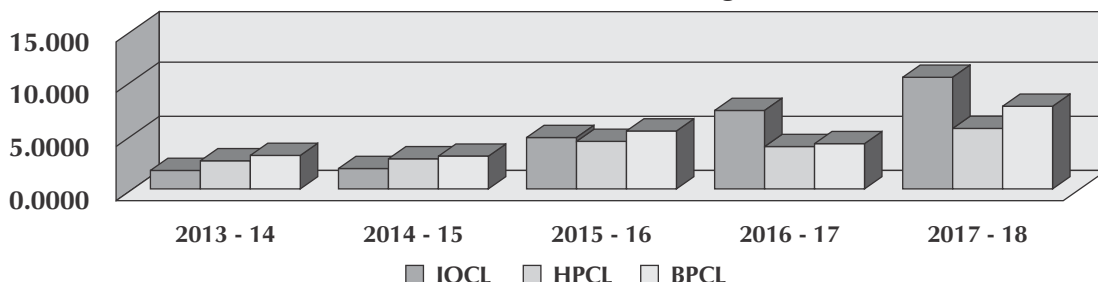
Indian Oil has maintained high inventory levels. It's a negative sign as it suggests heavy investments blocked in procuring the assets coupled with zero returns.

depend upon two factors: international oil prices and the cost of holding inventory. IOCL has no control over the international oil prices as it is determined by the external market forces. However IOCL can keep an accurate check on their inventory holding period.

Thus we can say that value of inventories mainly

Profitability Ratios:

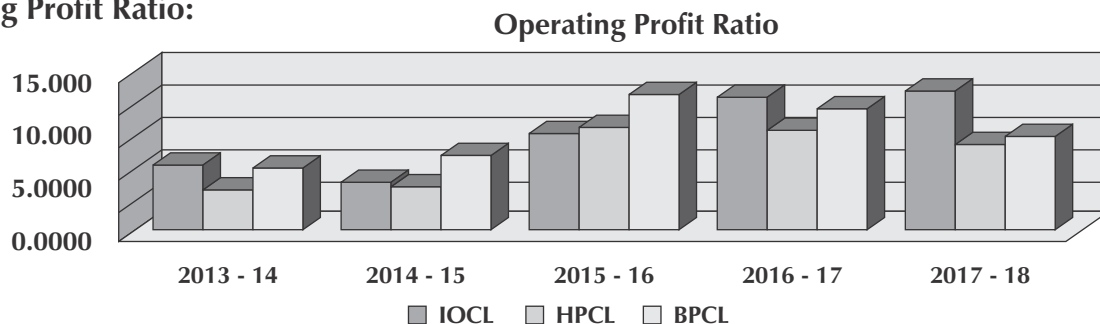
Gross Profit Margin



IOCL has revealed high amount of gross profits as compared to BPCL & HPCL. This is mainly due to high rise in sales. HPCL and BPCL are not able to

incur high profits due to the higher amount of operating expenses, trading expenses.

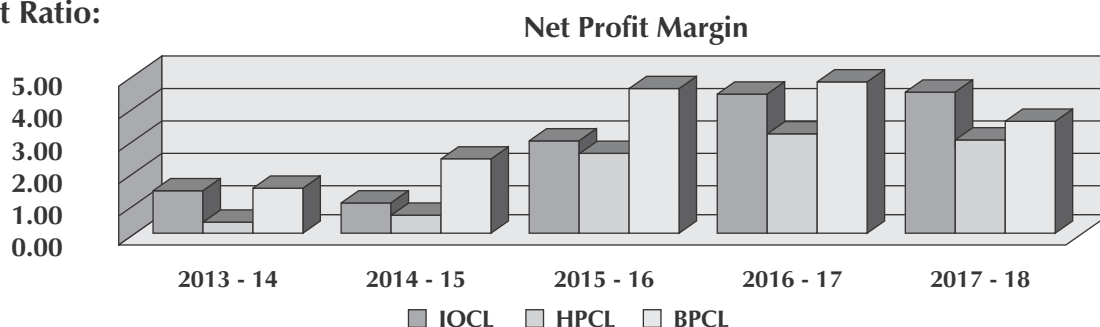
Operating Profit Ratio:



Operating Profit margin of IOCL has improved in the last five years. On the other hand the margin is seen to be decreasing for HPCL and BPCL. This may be due to the high amount of spending on

operating expenses. Because the Gross margin of HPCL and BPCL has an upward trend. So it must be the higher operating expenses that have caused the ratio to decrease.

Net Profit Ratio:



Net Profit margin of IOCL is seen to be having an upward trend over the years.

In the financial year 2017-18, the industry net profit margin has decreased due to increase in crude oil prices in the global oil market. However for IOCL the ratio has slightly increased which is a good sign for the company.

To analyze the relationship between liquidity and profitability six public sector companies were selected and last 10 data was taken into consideration. For liquidity 8 ratios related to working capital and ROE is selected as a measure of profitability. Simple co relation has been done to analyze the relationship between liquidity and profitability.

Objective 5: To analyse the impact of liquidity on profitability of the selected public sector oil and gas companies in India.

		RATIO							
Company		CR	QR	CATAR	CASR	WCTR	ITR	DTR	CTR
IOCL	r	-0.68	-0.68	-0.38	-0.03	-0.12	-0.66	0.27	-0.74
BPCL	r	-0.19	0.28	-0.43	-0.14	-0.38	-0.44	-0.19	0.10
HPCL	r	-0.14	-0.10	-0.41	-0.36	-0.65	0.27	0.06	-0.05
Gail	r	0.53	0.59	0.72	0.66	-0.13	0.59	0.15	-0.65
Oil India	r	0.31	0.35	0.91	0.39	-0.59	0.80	0.70	0.63
ONGC	r	0.27	0.36	0.78	0.54	0.45	-0.30	0.62	-0.19

For IOCL all the ratios except DTR are negatively co related to the ROE. That means with an increase in WCR, profitability decreases and vice versa.

The ratios for IOCL, HPCL and BPCL are negatively co related with the ROE that means with an increase in WCR, profitability decreases and vice versa. These negative associations indicate positive contribution to the profitability. The ratios of GAIL, Oil India and ONGC are positively co related. This may be because these companies are following an average working capital policy.

Objective 6: To assess the efficiency of working capital using Bhattacharya Model

Bhattacharya Model has been developed specifically to construct the performance index, utilization index and efficiency index of working capital. The model has been used to ascertain the

working capital efficiency in the selected public sector oil and gas companies in India.

Performance Index:

Performance Index (PLWCM) of working capital management indicates the average performance of different components of current assets. If the rise in sales is proportionately more than the increase in a component of current assets during a particular period, a firm may be said to have managed its working capital efficiently. In such cases the overall performance index is numerically greater than one.

$$PI = \frac{W_{(t-1)}}{W_t} * TI$$

Where, W = Individual Group of Current Asset
 N = Number of Current Asset in Group
 TI = Turnover Index = Sales in the Current Year/Sales in the Previous year

Year	Performance Index						ROE					
	ONGC	IOCL	OIL	BPCL	HPCL	GAIL	ONGC	IOCL	OIL	BPCL	HPCL	GAIL
2008-09	1.05	1.44	1.09	1.75	1.17	1.13	21.45	5.71	23.16	5.29	6.79	18.35
2009-10	0.90	0.58	0.80	0.77	0.87	1.00	19.13	20.42	18.96	11.86	12.15	18.68
2010-11	4.06	1.06	1.45	2.63	1.07	1.60	19.47	13.60	18.48	11.34	12.82	18.95
2011-12	0.95	1.28	1.13	1.07	1.08	1.27	20.62	6.99	19.55	5.36	1.33	17.83
2012-13	1.14	0.98	0.90	0.95	1.00	1.21	15.87	7.05	18.66	11.54	3.75	15.18
2013-14	0.91	0.87	1.11	1.19	0.95	0.96	15.39	10.43	14.36	20.13	7.71	14.74
2014-15	1.02	1.79	0.84	1.08	1.38	1.31	10.15	7.13	12.13	21.31	11.00	9.28
2015-16	7.08	8.95	7.14	0.77	0.81	0.90	6.50	13.79	8.25	28.48	28.92	6.36
2016-17	1.06	1.16	1.37	4.90	16.54	2.12	9.26	19.96	5.40	30.84	39.08	8.56
2017-18	2.46	1.94	1.09	1.23	1.24	0.93	10.31	19.50	9.42	25.42	28.27	11.52
Average	2.06	2.00	1.69	1.63	2.61	1.24						
R	-0.44	0.05	-0.42	0.34	0.67	-0.11						

Comments:

From the above table it is observed that the average performance index of all the selected companies is greater than 1. This reveals the efficient management of current assets. i.e. the rise in sales is proportionately more than the increase in current asset.

Considering performance index (PI), the efficiency of current assets management on financial performance is best in case of the company HPCL. In order to measure the relationship between performance index and profitability, correlation analysis has been done. The study reveals that in case of IOCL, HPCL and

BPCL, association between PI and ROE is positive and the associations are negative in case of Oil, Gail and ONGC indicating positive contribution towards profitability.

Utilisation Index:

Utilization Index (UI) indicates the ability of the firm in utilizing its current assets as a whole for the purpose of generating sales. This ultimately reflects the operating cycle of the firm, which can be shortened by means of increasing the degree of utilization. Thus, a value of UI greater than one is always desirable from the management of a company. It is calculated as, $UI = A_{(t-1)}/A_t$
Where A = Current Assets/Sales

Year	Utilisation Index						ROE					
	ONGC	IOCL	OIL	BPCL	HPCL	GAIL	ONGC	IOCL	OIL	BPCL	HPCL	GAIL
2008-09	0.94	1.55	0.87	1.65	1.40	1.08	21.45	5.71	23.16	5.29	6.79	18.35
2009-10	0.90	0.55	0.74	0.59	0.68	0.98	19.13	20.42	18.96	11.86	12.15	18.68
2010-11	2.21	0.99	0.92	1.27	0.99	1.81	19.47	13.60	18.48	11.34	12.82	18.95
2011-12	0.94	0.99	1.24	1.10	0.96	1.14	20.62	6.99	19.55	5.36	1.33	17.83
2012-13	1.20	1.05	0.90	1.14	1.08	1.24	15.87	7.05	18.66	11.54	3.75	15.18
2013-14	0.92	0.99	1.01	1.00	1.03	0.95	15.39	10.43	14.36	20.13	7.71	14.74
2014-15	1.03	1.39	1.07	1.15	1.46	1.20	10.15	7.13	12.13	21.31	11.00	9.28
2015-16	1.09	1.37	1.10	0.81	0.86	0.89	6.50	13.79	8.25	28.48	28.92	6.36
2016-17	1.28	0.69	1.37	0.90	1.21	1.54	9.26	19.96	5.40	30.84	39.08	8.56
2017-18	1.26	1.38	1.63	1.32	1.17	0.85	10.31	19.50	9.42	25.42	28.27	11.52
Average	1.18	1.10	1.09	1.09	1.08	1.17						
R	0.05	-0.51	-0.68	-0.37	0.02	0.19						

Comments:

From the above table it is observed that the average utilization index of all the selected companies is greater than 1. This reveals the ability of the companies in utilizing its current assets is satisfactory.

From the viewpoint of utilization index (UI), the efficiency in utilizing the current assets in generating sales is best in case of the company ONGC.

Analysis of correlation between UI and ROE

reveals that in case of ONGC, HPCL and GAIL, association between UI and ROE is positive and the associations are negative in case of IOCL, OIL and BPCL.

Thus it can be said that UI has no significant contribution towards the profitability of ONGC, HPCL and GAIL.

Efficiency Index:

The Efficiency Index (EI) measures the ultimate efficiency in working capital management of a concern. Since, it has been derived by multiplying the PI and the UI, a value more than one will obviously indicate a good sign in working capital management. The ultimate efficiency of working capital management depends on both the PI and UI and not solely on one of them.

It is calculated as $EI = PI * UI$

	Efficiency Index						ROE					
	ONGC	IOCL	OIL	BPCL	HPCL	GAIL	ONGC	IOCL	OIL	BPCL	HPCL	GAIL
2008-09	0.98	2.23	0.94	2.89	1.64	1.22	21.45	5.71	23.16	5.29	6.79	18.35
2009-10	0.81	0.32	0.60	0.46	0.59	0.98	19.13	20.42	18.96	11.86	12.15	18.68
2010-11	8.96	1.05	1.32	3.34	1.06	2.88	19.47	13.60	18.48	11.34	12.82	18.95
2011-12	0.89	1.26	1.41	1.18	1.05	1.44	20.62	6.99	19.55	5.36	1.33	17.83
2012-13	1.37	1.03	0.82	1.08	1.09	1.49	15.87	7.05	18.66	11.54	3.75	15.18
2013-14	0.84	0.86	1.11	1.20	0.98	0.91	15.39	10.43	14.36	20.13	7.71	14.74
2014-15	1.05	2.48	0.90	1.25	2.02	1.57	10.15	7.13	12.13	21.31	11.00	9.28
2015-16	7.70	12.30	7.88	0.63	0.70	0.80	6.50	13.79	8.25	28.48	28.92	6.36
2016-17	1.36	0.80	1.88	4.43	20.04	3.26	9.26	19.96	5.40	30.84	39.08	8.56
2017-18	3.11	2.67	1.78	1.63	1.45	0.80	10.31	19.50	9.42	25.42	28.27	11.52
Average	2.71	2.50	1.86	1.81	3.06	1.54						
R	-0.21	0.01	-0.51	0.13	0.66	-0.01						

Comments:

Based on the average values of efficiency index (EI), it is revealed that the overall efficiency in managing the current assets is best in case of the company HPCL. In order to measure the relationship between efficiency index and profitability, correlation analysis has been done.

The study reveals that in case of IOCL, BPCL and HPCL, association between EI and ROE is positive and the associations are negative in case

of ONGC, OIL and GAIL. Thus it can be said that EI of IOCL, BPCL and HPCL have no significant influence towards the profitability of the concerned company.

Findings and Interpretation:

The results of regression analysis showed that there is a significant relationship between debtors and sales and the variation in Sales exist because there is a variation in Debtors.

Indian oil is following aggressive working capital policy, the working capital of Indian oil is negative.

On analysing the Working Capital Cycle, it was noticed that Receivable days and payable days were constant throughout the years. It was the change in Inventory days that caused the increase in working capital cycle. Inventory has increased due to the increase in consumption. The company is seen to be spending more on COGS.

IOCL is a profit making company and it has registered more profit as compared to its competitors and is a leader in the oil industry in India.

Thus it is evident that though IOCL maintains a low liquidity but at the same time it incurs a profit as profitability varies inversely with liquidity.

Correlation analysis reveals both positive and negative association between independent variable and Return on Equity.

Ratios of IOCL, BPCL and HPCL are negatively correlated with the profitability. However the ratios of Oil India, Gail and ONGC are positively associated with the profitability.

Again, the study of associations between ROE and PI, UI and EI for the selected companies under study, have registered both positive and negative relationships. EI of IOCL, BPCL and HPCL have no significant influence towards the profitability of the concerned company.

Limitations:

Time is definitely the main Constraint. Time was not sufficient enough to assess all processes and policies of an organization of the stature of IOCL. Even if the actual data can be gathered, it is often against the company policy to disclose such data in the project report. Hence certain assumptions

had to be taken in consideration.

Annual Report of 2017-18 was not published during the preparation of the report and so it is neglected in many of the analysis.

Future Scope:

Indian Oil Corporation is the leader in the oil sector in India. Comparative analysis of Indian oil corporation can be done with its global peers and its position can be determined by analysing it with companies like Petrochina Ltd., which is highly recognized for the quantum of operation and moreover for the large turnover it generates due to heavy refining activities. Alongside the comparison with Petrochina Corporation Ltd., Indian oil can be further compared to European refining companies such as Royal Dutch Shell, ExxonMobil. This will expose Indian oil's Performance not only within Asia but also with the European companies to understand gaps in managing the working capital.

Conclusion

It is evident from the above analysis that IOCL follows an aggressive working capital policy i.e. low amount of investment in current assets. Thus it is evident that though IOCL maintains a low liquidity but at the same time it makes higher profit as profitability varies inversely with liquidity.

The Debtors of IOCL are more or less well managed because though the Sale is increasing every year, the Sundry Debtors are maintained. So is the Average Collection Period which is also showing a consistent trend through years.

Correlation analysis reveals the positive as well as negative association of 8 working capital variables with the Return on Equity. Independent Variables of IOCL, BPCL and HPCL have a significant influence on the overall profitability,

whereas, the variables of Gail, Oil India and ONGC do not contribute to the profitability of the concerned companies.

Recommendations:

IOCL can follow an average policy that provides the optimum combination of the three issues of working capital management liquidity, profitability and return.

Due to shale oil and various other restrictions on the OPEC nations, Indian oil must shift towards the United States of America for their crude requirement and balance the remaining crude output from Oil India and ONGC.

Just in Time Inventory mechanism should be followed by IOCL to reduce the Inventory Holding Period and there-by the cash conversion cycle of the Company can be decreased mitigating the problem of cash flow. For better receivable Management Prices can be updated in SAP regularly.

All the customers can use the RTGS or Core-to-Core facility for better regulation

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Acknowledgement:

I express my deepest gratitude to Mr. Cyril Castelino, Senior Manager (Finance), IOCL for his co-operation and help during the training period. I would also like to acknowledge Prof. Pushkar Parulekar (Faculty Guide) and Dr. Smita Jesudasan (Mentor) for their co-operation and inputs throughout the course of this project.

A study on Factors affecting Blockchain Technology adoption among Corporate

- Mr. Suryavijay Sankathaprasad Sharma
(PGDM II Marketing)

Introduction:

Blockchain is a Never-ending ledger which keeps track record of each and every Crypto-currency transaction that has ever been performed. The blocks which keep records are added to the Blockchain system in a chronological order. The new Blockchain technology has an ability to execute financial operations instantantly through permissioned ledgers which are distributed uniformly. Blockchain Technology evolved during 90's but it came into limelight after Satoshi Nakamoto created distributed ledger technology based peer to peer transacting platform in crypto currency. As BCT has its unique feature of decentralised, immutable, unhackable and irreversible process experts started looking for possibilities of using Blockchain technology in various sectors such as Finance, Trade, Supply chain management, Sustainable development etc.

The Global Blockchain Technology Market is expected to grow at 51% CAGR during the forecast period, 2017-2022. In 2016, the market was led by North America with 49% share, followed by Europe and Asia Pacific with shares of 25.67% and 15.76%, respectively. According to a new report by registering a 37.2% CAGR during the forecast period. Currently there is high demand for Blockchain technology and it is increasing in speedy way. As Blockchain has potency to eliminate various errors or problem faced by various sectors so that all Industries are foraying and testing possibilities of BCT for their particular industry. Such as financial services

providing companies, consumer or industrial items, Informational technology, media and telecom, healthcare, transportation, and public sectors are largely responsible for market growth.

Blockchain technology performs as an electronic transaction-processing and record-keeping system. Disruptive technology of

Blockchain allows various participants who all are interlined to the BCT network, usually public, to track information through a secure network, thereby eliminating the need for any kind of third-party verification. Nowadays online transactions have increased in very speedy way, digitization of currency, and secure online payment gateways are few of the major factors expected to fuel demand over the coming years. Blockchain technology market is expected to show tremendous growth such as eliminating need for any financial intermediaries to authenticate transactions, eliminating reconciliation, it reduces the chances of duplicate record keeping. Blockchain Technology facilitates faster settlement, and it minimizes error rates. This technology allows access to databases from everywhere, thereby allowing multiple institutions to use it simultaneously to bring different systems nearer and help improve efficiency.

Framework of Blockchain Technology

- Public
- Private
- Hybrid

Sectors to be benefited of Blockchain Technology Application

- Financial Services
- Consumer or Industrial Products
- Information Technology, Media, and Telecom
- Healthcare Industry
- Supply chain
- Public Sector

As per the Report of Leading research company Gartner Global IT Spend will touch to \$3.68 Trillion in this year 2018. It is expected to grow by 4.5 per cent.

The growth of the market vendors is dependent on the market conditions, government support, and industry development. Thus, the vendors should focus on expanding geographically and improving services.

- IBM Corporation (U.S.)
- Microsoft Corporation (U.S.)
- Deloitte, Inc. (U.S.)
- Ripple (U.S.)
- Coinbase (U.S.)
- Chain, Inc. (U.S.)
- Abra, Inc. (U.S.)
- Bitfury Group (U.S.)
- Block-chain tech Ltd. (U.K.)
- Earthport PLC (U.K.)

Need for study

- Literature states that there is enormous need of adoption of the Blockchain technology in near future but because of traditional Indian mentality the pace for growth of BCT is very slow. The study tries to find out what are the factors on which enough focus should be given and whether demographic factor creates an impact.
- Although there have been lots of studies on potential of Blockchain technology in Global

market, no research exists in the academic domain in India in terms of understanding the scepticism of corporates towards Blockchain technology and its impact on the various sectors

Objectives of the study:

- To Understand Blockchain technology and its present status in global market
- To compare traditional method of supply chain with Blockchain technology enabled supply chain and analyse its benefits
- To find what are the factors that lead to the decision for opting Blockchain technology

Objective-1: To Understand Blockchain technology and its present status in global market.

The Global Blockchain Technology Market is expected to grow at 51% CAGR during the forecast period, 2017-2022. In 2016, the market was led by North America with 49% share, followed by Europe and Asia Pacific with shares of 25.67% and 15.76%, respectively.

Market Size	<ul style="list-style-type: none"> • 2016 USD 300 MILLION • 2022 USD 2 Billion
CAGR	<ul style="list-style-type: none"> • 51%
Key Geographic's	<ul style="list-style-type: none"> • North America 49.9% • Asia Pacific: 15.76% • Europe: 25.67% • Rest of the World: 8.67%
Key Leading Regions	<ul style="list-style-type: none"> • U.S. • U.K. • Germany • China
Key Market Drivers	<ul style="list-style-type: none"> • Increased used of Blockchain Technology for Designing crypto-currencies. • Offers secure platform For money transaction. • Data Security against malicious attacks
Key Market Opportunities	<ul style="list-style-type: none"> • Higher implementation of the Blockchain Technology for Payments, Smart Contracts, and Digital Identities.

Blockchain Technology with its unique feature of distributed ledger technology and decentralised process it secures the transaction over BCT platform. BCT eliminates the middleperson and reduces the cost. BCT is coded in cryptographically manner in which users or participants cannot manipulate or delete the transaction history. It is also known as immutable process. As below chart explains how a Blockchain transaction takes place. If Party A controls the right to transfer any amount of Digital coins he creates a transaction to send this right to party B and broadcast it across the network. System checks it and if it is valid then the transaction is configured into a block and it sends detail to all users over network. If it is found valid it is added to the Blockchain and after completion of this procedure Party B controls the right to transfer the coins to others, and the process continues.

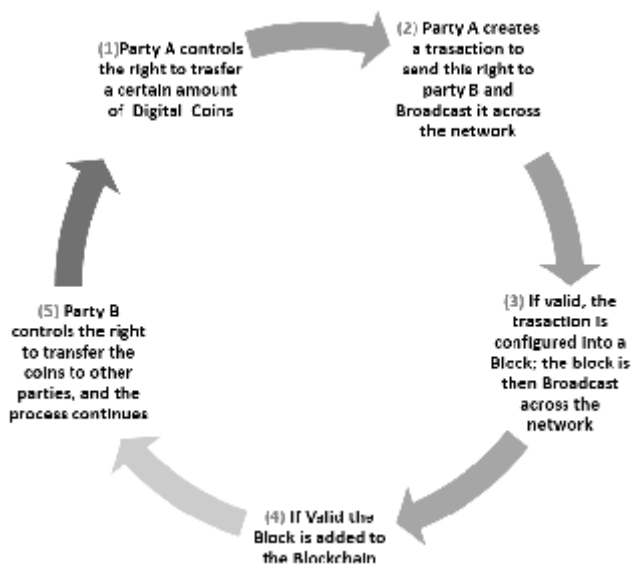


Figure: A Blockchain Transaction

Objective 2: To compare traditional method of supply chain with Blockchain technology enabled supply chain and analyse its benefits

IBM said Blockchain has ability to reduce 20% cost which is involved in current Supply chain

solution and it will save time by more than 40%. Blockchain will eliminate all paper works with its digital footprint such as DLT Technology will help in easing Supply chain.

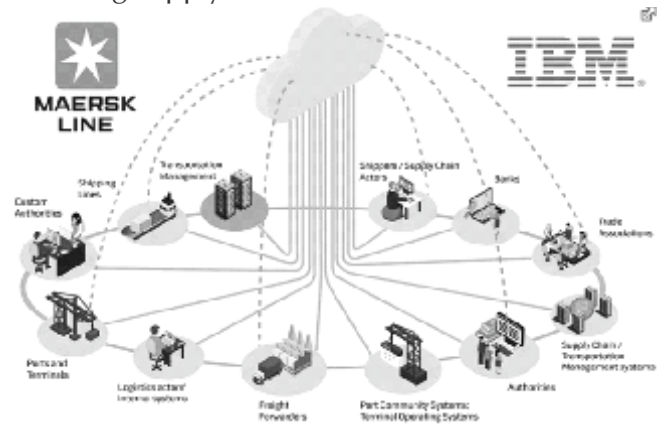


Figure:- BCT Enables Supply chain

Objective 3: To find what are the factors that lead to the decision for opting Blockchain technology

Research Methodology

- Type of research : Qualitative & Quantitative
- Data Source : Primary Data & Secondary data
- Data Collection Method : Survey
- Research instrument : Questionnaire
- Pilot Study : Design interviews with marketing managers of 10 Companies

Research Design:

- This study includes exploratory & descriptive research design
- A structured questionnaire was formulated
- Data collected was analysed using appropriate data analysis tool IBM SPSS statistics 25

Sampling Frame:

- Target Population - Potential Customers and existing customers of Techizta Services Pvt. Ltd
- Sample size - 108 Respondents
- Methodology - The survey was conducted using the questionnaire and was circulated

over Social media and one to one Meetings to get responses

- Scope of study: Mumbai
- Time period - 2 Months

The study is a descriptive research. The research includes insights and ratings of decision makers and senior level employees who have greater exposure to the current organisational structure.

Research Tool: Data collected was analysed using appropriate data analysis tool IBM SPSS statistics 25

Sample no: 108

Data Type: Primary & secondary

Followings are the factors which were obtained from Pilot Study

- High Cost
- Scepticism about new Technology
- Conducting Seminar on Technology
- Awareness
- Transparency
- Data Privacy
- Infancy stage of Technology
- Service delivery Model
- High data Maintenance cost
- Effective for Big organizations only
- Buying Blockchain technology
- Myths about Technology
- Acceptance adoption in India
- Crypto currency and Blockchain one and same thing
- Technology will be more successful in developed countries

Data analysis:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.844	0.875	15

A Factor analysis using SPSS was conducted to find out the most important factors from ones listed above. In data reliability test the value should be 0.7 or which is more than 0.7 and hence we can use the data for further analysis

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.85
Bartlett's Test of Sphericity Approx. Chi-Square	1030.8
Df	105
Sig.	0

In general a value above 0.50 is considered an acceptable value and the data has a value of 0.85. We also take a look at the significance level which is 0.00 which again is lesser than 0.5 and is preferred.

Reliability Statistics: The reliability of questionnaire is of utmost importance for any study. The reliability analysis result showed that the Cronbach's alpha was .844 for 15 times. It is important that the reliability test value should be 0.70 or more. As we can see, the alpha value is 0.84 which is more than stipulated value of 0.70 and hence we can use the data for further analysis. This depicts that the questionnaire is reliable to be used for used collection

KMO and Bartlett's test: Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin measures

of sampling adequacy are the two tests that can be used to determine the factorability of the matrix as a whole. In general anything above 0.50 is considered as an acceptable value. In addition the KMO Measures 0.850 which is greater than 0.50. This indicates that the sample is adequate for factor analysis. Bartlett’s test of Sphericity had a p value significance of 0.00 0 which is less than 0.05. It’s suggested that if the Bartlett’s test of Sphericity is significant, and if the Kaiser-Meyer-Olkin measures are greater than 0.50, then factorability is assumed. Thus, based on the results, it is appropriate to proceed with factor analysis examine factors that affects Blockchain technology adoption among corporates

Total Variance is explained:

Total variance is explained at three stages for factors that affects adoption of Blockchain technology among corporates. Three factors were extracted because their Eigen values were greater than 1.00. On extraction of three factors, the 67.51 per cent of the variance could be explained

Rotation Component Matrix

After performing Varimax rotation method with Kaiser Normalization

Factor 1 comprised of eight items with factors loadings 0.657, 0.805, 0.889, 0.908, 0.877, 0.508, 0.787, and 0.732. These nine items are Blockchain adoption, transparency, Data privacy, delivery model, high cost, Data maintenance cost, Acceptance in India, Blockchain in developed countries.

Factor 2 Comprised of five items with factor loadings 0.757, 0.82, 0.692, 0.724, 0.819. The items on factor 2 are Crypto currency and BCT as same, BCT effective for big organizations only, Blockchain seminar, adoption of BCT among

peer companies and BCT Based Companies.

Factor 3 comprised of two items with factor loadings 0.885, 0.773. The items in factor 3 are awareness and myths about Blockchain technology

Name of new factor with percentage of variance

Factor	Name	Percentage of Variance
1	Scepticism towards Blockchain Technology	35.785
2	Apprehensions towards acceptance	20.625
3	Salience	11.104

Factor Analysis:

The reliability of the questionnaire is of utmost importance for study. The reliability analysis result showed that the Cronbach’s alpha was .844 for 15 items. This depicts that the questionnaire is reliable to be used for data collection. The KMO value of sampling adequacy is 0.850 which is greater than 0.50. This indicated that the sample is adequate for factor analysis. Bartlett’s test of Sphericity had a p value (Significance) of 0.00 which is less than 0.05. This indicates that factor analysis in this case is valid. Total variance explained SPSS extracted three factors and cumulative 67.51 per cent. These three factors explain 67.51 per cent variance. Thus, 67.51 per cent of the factors are more important as they affect the adoption of Blockchain technology among corporates.

Recommendations

- Techizta services Pvt. Ltd. Should come up with new ways of engaging their audience through various media mix. It will help them in retaining their existing client as well as pouring new customers into the bucket

- As BCT is on its infant stage in a country like India, not many people are aware about the invention. company should conduct some awareness programmes on Blockchain technology
- As Techizta services Pvt. Ltd. Conducts Seminar/Workshop for Engineering and management colleges. There is still High potential untapped market where they can focus and it will help them in achieving their objective
- Seminar/Workshop in Engineering/management colleges will not only help in creating awareness but also it will fulfil the requirement of potential Blockchain developers in future

Limitations

Respondents were not willing to fully disclose information on the issues and questions asked. Based on the factor analysis, we concluded that only 67.51 per cent of the factors affects the adoption of Blockchain technology among corporates but the remaining 32.41 per cent of the factors are unknown, as we don't know what all other factors affects the adoption of Blockchain technology among corporates. The study has been undertaken only in the City of Mumbai

Future Scope

- Number of respondents has been limited to 108 which is not sufficient enough to generalise results/findings
- Study could be done to find out which factors has the highest influence over the others and how a marketer can focus on it more to get adoption of Blockchain technology
- The study could further be extended to other metropolitan cities in India to find out whether various Corporates behave in similar manner across geographical locations

Conclusion

Blockchain technology has the potential to bring efficiency and effectiveness in various sectors such as financial trade, information technology, supply chain management and sustainable development etc. but the facts also cannot be avoided as in a country like India which is having second highest population in the world but very limited people are there who is aware about new Blockchain technology.

Hence in initial phase we can say that creating awareness is an important aspect as it makes the product more visible to its target audience and it can affect the adoption ratio among various potential customers. Brand awareness is generated in many forms, brand activation being one of the major part which bring the target audience more closer towards brand in terms of knowing the brand and getting more connected so that, more new customers can be increased and also brand loyalty is increased among existing customers.

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ACKNOWLEDGEMENT

First and foremost, I would like to thank Prof. Sanchayita Banerjee for her guidance through my Summer Internship. Her constant encouragement, support and patience. Because of which I was able to complete my summer project on time.

I would like to thank Mr. Rohan Randive (CMO) Techizta Services Pvt. Ltd. parent company of Blockchain Magazine for being my industry guide.

Customer Satisfaction Study For Services of Pixeltech Security Pvt Ltd

- Mr. Hiten Modh
(MMM IIIrd year)

Abstract:

To provide excellent service, an organization needs to exceed customer expectations. An important factor in providing good service is to keep promises always and not to guarantee things that cannot be delivered. The main reason behind the research is to measure whether the current situation of customer service was satisfactory of company PixelTech Security Pvt Ltd. Furthermore, to consider the possible way that can be improved. The current customer satisfaction level, factors affecting those satisfactions and customer loyalty factors will be discussed in this thesis.

SWOT ANALYSIS:

Strength:

- Having more than 13 years of Technical & Business Experience in same field
- Having Strong Corporate Customer Base
- Having Good Experienced Engineers
- Enjoying Cost Benefit of majority products.
- Optimized utilizations of Man & Material Resources

Weakness:

- Less Marketing & Advertising Promotion
- Less pan India regional presence.

Opportunities:

- Faster growing market
- More scope to use existing recourses

Threats:

- Very competitive market and price

Industry Overview:

It is very competitive market in Low Voltage Facility Engineering, Procurement and Construction (EPC). There are many large & listed facilities providing engineering companies available in market.

Now days, it is changing from manual process to automation with IOT (Internet of Thing's) technologies with Integrated solutions.

Top five manufacturing Competitors:

- Honeywell – Morley/System Sensor/Notifier
- Tyco
- Siemens
- UTS – Edward
- Ravel
- Rosslare
- HID
- Godrej

Top Five Distributor:

- ADI (Honeywell Division) – Distributor of all major products
- DeviKaram – Distributor of Honeywell, Notifier Products
- System Product Enterprise (SPE) – Distributor Honeywell, Ravel
- CPVaswani – Distributor of Honeywell, Ravel, Notifier
- 3SS – Distributor of Notifier, Ravel

Top Five Competitors Service Provider:

- Consumer service Provider: Zicom
- Electrical Contractors: Schneider Electric, Voltas, SEW, Ahluwalia
- Fire License Holders: Electromech

Solution Process Flow:



Need for study:

The purpose of this study is to measure the current satisfaction level of the customer as well as better understand the customer’s needs from company’s point of view for improving the service level.

It will also analyse the reason and factors that influences customers’ satisfaction level and assist to find out the problems with the service of the case company. The analysis combined with empirical study in order to solve practical problems and find logical solution as well as give insight that might help the company to improve satisfaction level of customer and service level of the company.

Objectives of the study:

- To find Customer Satisfaction level with Services of PixelTech Security Pvt Ltd.

- To find the parameters which affects the Customer Satisfaction
- To find the parameters that affect the business recommendation and create word of mouth.
- To find the parameters that create the Business Loyalty.

Research Methodology;

Research design:

The research design used in this thesis is a descriptive method in the form of a questionnaire to customers. All the data will be collected through questionnaire and analysed by the Google Forms. Based on those data result, author will finally give suggestion in conclusion part that might help the case company to improve their service level.

Sampling

Convenient non-probability sampling technique
The total sample size was 30 companies.

Data collection tool and techniques

In quantitative research, every respondent was asked the same series of structured questions (questionnaires). All the data will be collected through questionnaire and analysed by the Google Forms. Based on those data result, author will finally give suggestion in conclusion part that might help the case company to improve their service level.

Data Analysis

Statistical tools used to analyse the data and come to conclusions were bar graphs (frequencies), Correlation, Regression and Chi square test to see the relationship and associations amongst the variables.

Sample size and demographics

A total of 50 SME companies were sent invitation to fill up the form online. Out of 50, only 30 has responded.

Data Finding & Analysis

The questionnaire was divided into three parts, first part about general information of the customer, second part concerned about satisfaction level of the customer with service and Third part is relate to the Purchase Pattern with respect to Price, Warranty, Features factors.

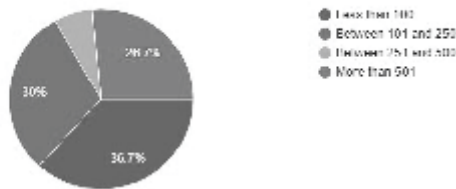
The general information part includes the basic profile of corporate respondents about Employee Strength, how long they are associated with company and which are systems purchased from company.

It is very important for the case company to know about what kind of customer are their value customer.

Corporate Strength:

It shows the majority corporate clients have more than 100 employees with aprx. 56% in which 50% have more than 500 employees.

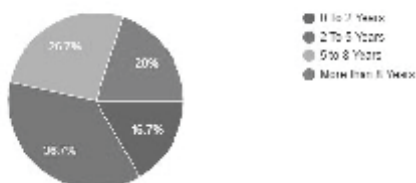
How many employees work for your Organisation? *



Since how long they are associated with our client:

This shows that more than 80% customers are continuing their service with our company even after 2 years. It shows very important aspect that even after 5 years of site installation the customer will remain associated with company.

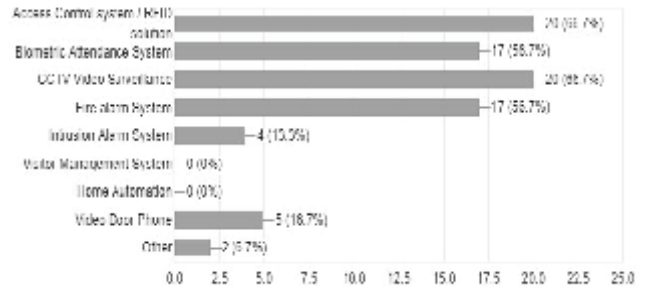
How Long you are associated with us ?



Which are systems being majorly people used.

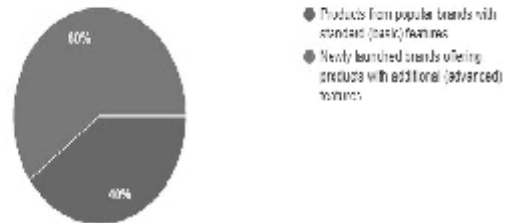
It shows that Clients are using which type of Product service mix scape. It clearly shows that normally clients are getting multiple services from company.

List out the Systems supplied and / or Maintained by us.



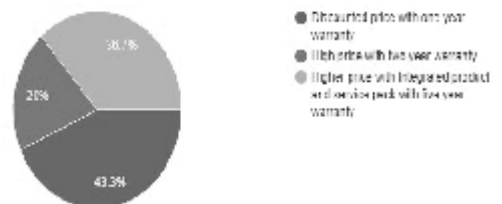
Customer’s opinion about the Product of the Features:

Which of the following would you most likely consider purchasing?



Customer’s Opinion about the Product & Service with respect to warranty:

With respect to warranty & service which of the following would you prefer for a new purchase?



4.6 The analysis of responses to the survey questions were as follows:

4.6.1 Customer’s Current Satisfaction with PixelTech Security Pvt Ltd.

Hypothesis:

Rate your overall satisfaction with our products and services based on your experiences with us on a scale of 1 to 5.

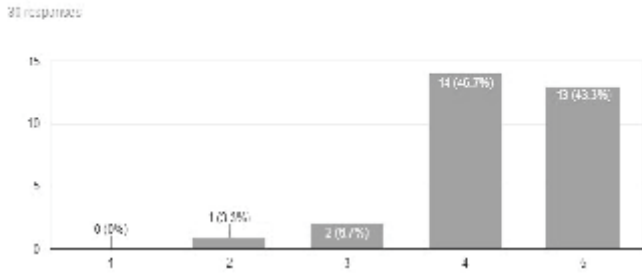


Fig4.6.1 Overall Satisfaction

Customer Satisfaction is affected with following 10 independent Variables and their Correlation with each other:

Independent Variables are:

- The designed (product) solution meet your Requirement
- Quality of the product meets your expectation.
- Installation is completed as per expected time.
- Installation maintains the aesthetic environment without damaging interiors.
- System Handover done with sufficient Testing and documentation.
- Support call is registered timely and without issues.
- Response Time shows how fast customer issue is handled after registration call log.
- Preventive Maintenance (PM) Calls are scheduled Timely with pre-appointment.
- Service report gives complete information about Break down & system status.
- Annual Maintenance Contract (AMC) Satisfaction

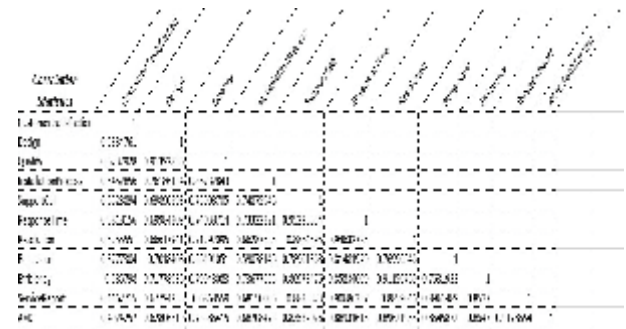


Fig. 4.6.1.1 Customer satisfaction Independent Variable Correlation:

Regression Model of Customer Satisfaction

we would like to build a regression model consisting of 10 independent variables to predict the Customer Satisfaction level.

Regression Test: SURVIVAL CUTPOINT									
Regression Statistics									
Multiple R	0.7811071								
F Statistic	0.0196705								
Adjusted R Square	0.6724720								
Standard Error	0.2772107								
Observations	30								
ANOVA									
	df	SS	MS	F	P-Value	Upper Tail	Lower Tail	Upper Tail	Lower Tail
Regression	11	1.11211567	0.10110142	1.45244627	0.0196705				
Residual	18	1.25267918	0.06959330						
Total	29	2.36479485							
Coefficients									
	Coef.	Standard Error	t-Stat	P-value	Lower Tail	Upper Tail	Lower Tail	Upper Tail	Lower Tail
Intercept	1.2112789	0.02624420	45.784802	0.0000000	1.4798177	4.2217244	1.4798177	4.2217244	4.2217244
Designed	0.01126228	0.00716218	1.5725083	0.0215754	0.0516280	0.01126228	0.0516280	0.01126228	0.0516280
Quality	0.11488489	0.00875627	12.903882	0.0000000	1.2471480	1.2471480	1.2471480	1.2471480	1.2471480
Installation	0.04463645	0.02411279	1.8429882	0.0712876	0.02611408	0.04463645	0.02611408	0.04463645	0.02611408
Aesthetic	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
System Handover	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
Support Call	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
Response Time	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
Preventive Maintenance	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
Service Report	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
Annual Maintenance	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000
AMC	0.07410771	0.02408771	3.0767683	0.0000000	1.0400000	1.0400000	1.0400000	1.0400000	1.0400000

Analysis:

- Multiple R Value shows that the said Ten Independent variables are highly correlated up to 78.11%.
- These 10 independent Variable affects up to 61% of Customer Satisfaction Level.
- F Test value (0.01967) < Alpha Value (0.05), shows statistically Significant
- Customer Response Time (P-Value: 0.02) and Engineer’s Efficiency (P Value: 0.046) significantly motivate the customer satisfaction level as these are below alpha Value (0.05).

Hypothesis: Will customer continued the PixelTech Security Services?

Null (H0): There is no influence of customer satisfaction on Business Continuity/loyalty.

Alternate (H1): there is influence connection Customer Satisfaction on Business loyalty.

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.76901385					
R Square	0.591079876					
Adjusted R Square	0.574259948					
Standard Error	0.408800649					
Observations	241					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	10	1.017749	0.1017749	25.54621	0.000000001	
Residual	19	1.09111	0.0574268			
Total	29	2.108859				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	3.217758302	0.705000	4.563877	0.000082	1.67322217	4.76229443
Design	0.049492008	0.002018	24.5269	0.000000	0.04545384	0.05353017
Quality	0.073902613	0.002629	28.1053	0.000000	0.06864734	0.08015789
Installation Process	0.048810626	0.002676	18.2289	0.000000	0.04349718	0.05412407
Support Call	-0.021182017	0.002829	-7.4988	0.000000	-0.02681118	-0.01555285
Responsibility	0.025499701	0.002107	12.0991	0.000000	0.02128254	0.02971686
Resolution	-0.063019005	0.002107	-29.8551	0.000000	-0.06722617	-0.05881184
Resolution	0.030311075	0.002107	14.3859	0.000000	0.02609391	0.03452824
Efficiency	0.015153883	0.002107	7.1920	0.000000	0.01094672	0.01936105
Service Support	0.006622622	0.002829	2.3406	0.022409	0.00099319	0.01225105
P-Value	0.000000001	0.000000	0.000000	0.000000001	0.000000001	0.000000001

Fig: 4.6.2 Regression Model of Business Continuity

Analysis:

- Multiple R Value shows that the said Ten Independent variables are highly correlated up to 76.94%.
- These 10 independent Variable affects up to 59.19% of Customer loyalty.
- F Test value (0.027) < Alpha Value (0.05), shows statistically Significant
- Customer Response Time (P-Value: 0.024) and Engineer’s Service Report (P Value: 0.028) significantly motivate the Customer’s business continuity level as these are below alpha Value (0.05).

Hypothesis: Will Customer recommend the PixelTech Security Pvt Ltd.’s Services to other?

Null (H0): there is no influence of customer satisfaction on recommending services to others.
 Alternate (H1): there is influence of customer satisfaction on recommending services to others.

REGRESSION TEST SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.81726796					
R Square	0.66772168					
Adjusted R Square	0.64168843					
Standard Error	0.49367756					
Observations	241					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	10	1.6627101	0.1662710	118.274	0.000000001	
Residual	19	1.1737501	0.0617763			
Total	29	2.8364602				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	3.7812372	0.0530861	70.85175	0.000000	3.67493282	3.88854158
Design	0.21682001	0.00478163	45.34181	0.000000	0.20725737	0.22638265
Quality	0.07421461	0.00257068	28.74032	0.000000	0.06906394	0.07936528
Installation Process	0.07114926	0.00257068	27.6654	0.000000	0.06600817	0.07629035
Support Call	0.1112270	0.00257068	43.2371	0.000000	0.10606633	0.11638767
Responsibility	0.00871951	0.00257068	3.38913	0.000984	0.00358814	0.01385088
Resolution	-0.03761576	0.00257068	-14.6311	0.000000	-0.04278612	-0.03244540
Resolution	0.01259713	0.00257068	4.90136	0.000000	0.00732646	0.01786780
Efficiency	0.03273960	0.00257068	12.7346	0.000000	0.02756893	0.03791027
Service Support	-0.0134876	0.00257068	-5.2471	0.000000	-0.01865827	-0.00831693
P-Value	0.000000001	0.000000	0.000000	0.000000001	0.000000001	0.000000001

Fig 4.6.3. Regression Model of Customer Recommendation

Analysis:

- Multiple R Value shows that the said Ten Independent variables are highly correlated up to 81.73%.
- These 10 independent Variable affects up to 66.79% of Customer’s recommendation Level.
- F Test value (0.0058) < Alpha Value (0.05), shows statistically Significant
- Installation Process (0.05138), Customer Response Time (0.0079), Speedy Resolution (0.058) and Service Report (0.03) are main factors, significantly affect the Customer’s recommendation.

Hypothesis: How Customer Purchase preference can be influenced with different types of Products & Service.

Research Question: Is there a significant association between Variance of products and Price with warranty in purchase behaviour?

	Standard Product	Featured Product	
Discounted Price (1Yr warranty)	5.2	7.8	13
High Price with 2Yrs warranty	2.4	3.6	6
Highest Price with 5 Yrs. Warranty	4.4	6.6	11
Total	12	18	30

	Standard Product (Branded)	Featured Product (Unbranded)	
Discounted Price (1Yr warranty)	4	9	13
High Price with 2Yrs warranty	4	2	6
Highest Price with 5 Yrs. Warranty	4	7	11
Total	12	18	30

Null (H0): There is no Significant association between product’s Price & warranty with Brand Choice.

Alternate (H1): There is Significant association between product’s Price & warranty with Brand Choice.

Dependent Variables:

- Branded Product with Standard Features
- Unbranded Product with Advanced Features.

Independent Variables:

- Discounted Price with One Year Warranty
- Higher price with Two Years Warranty
- Highest Price with Five Years Warranty

Chi Square Value is 0.31664907 > Alpha Value (0.05)

Interpretation: Since the Chi Square value is greater than the significance value (Alpha), we accept the null hypothesis.

Hence, there is no significant association between product’s Price & warranty with Brand choice.

Learning from the study:

The purpose of this dissertation is to find out which parameters, service companies are using in order to create customer satisfaction and customer loyalty. The purpose of this research was to gain a better understanding of the service quality dimensions that affect customer satisfaction from customer perspective.

Conclusion

The study concludes the Customer Response Time plays significant role in all Customer Satisfaction, Business Continuity and Customer Recommendation.

While Response Time & Employee Efficiency plays significant role in Customer satisfaction.

Service report (which shows the System Health Status) and Employee Response increase the Business Continuity level with same client multiple times.

System Installation Process, Employee Efficiency in speedy response and resolution with Service report increase the Customer recommendation.

There is no association between product’s price & warranty with brand choice, people give equal weightage to both Featured Products (Unbranded) and Branded Choice.

Suggestion:

As an employee Speedy response and resolution are critical tasks, which could be further reduced by implementing the CRM application, which

also helps to generate the Service report automatically.

CRM application would be help to increase the customer loyalty, professionalism and immediate response on customer feedback.

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Wadud Sharmin (2012), Customer Satisfaction in Business: A Case study of MoonTravel Ltd (Thesis), <https://www.theseus.fi/bitstream/handle/10024/54685/Wadud%20Sharmin.pdf?sequence=1>

ACKNOWLEDGEMENT

I would like to thank Prof. Jackson John for his guidance through my project.

A Study on Pre and Post Order in Marketing Process at L&T Heavy Engineering

- Mr. Revant Shah
(PGDM II Marketing)

Introduction:

The Heavy and Civil Engineering Construction subsector comprises establishments whose primary activity is the construction of entire engineering projects (e.g., highways and dams), and specialty trade contractors, whose primary activity is the production of a specific component for such projects.

In this project we have studied about the marketing pre and post order processes involved bidding for project that comes in the company for inquiry to understand the marketing process from the beginning till end of each bidding process for a product and to identify the opportunity of enhancement. The study mainly focuses only the marketing process in the field of Oil and Gas industry of Heavy Engineering department of L&T located in Powai, Mumbai whose major operations are conducted from Hazira.

The pre order bidding process includes receiving of RFQ, generating ERFER till we consolidate all data from different departments regarding the bid, deciding if we can go ahead with the bid, if yes, we prepare offer for bidding. Post order bidding includes conducting PAM and handling over project to PMG team for execution till sending invoice to the client and collection of payments. The various products for which inquiry is received are Hydro processing Reactor & Separator, Coke Drum, Tubular Reactors, Complete FCC Unit Packages, Large CS/ SS Clad Columns and LNG Vessels & Column Gasification Equipment.

The efficiency and effectiveness of the marketing department depends on the responsiveness, clarity and communication with other departments. Good marketing process can lead to better customer relationship. Project is specifically conducted under RCOG department of L&T heavy engineering.

Development of the project has been done mainly in two parts:-

1. Pre-order marketing process
2. Post order marketing process

Need for study:

There are two major challenges every make to order firm faces. One is pricing and the other is quoting due date for the RFQ. Also reducing the lead time taken by each department can also be another challenge in order to increase the profitability of the project.

The purpose of this project is to understand how the aforementioned can be tackled.

Objective of the study:

1. To develop a model for pre-marketing order process.

Since the process of pre-order bidding is complex, a process flow model is necessary for one to understand the actual process by a reference model, starting from receiving the RFQ to Offer Preparation.

2. To develop a model for post-marketing order process.

After winning the order, the execution part is

majorly done by PMG and other departments such as F&A, Legal and Treasury etc. during the execution of the project, marketing department needs to co-ordinate with these departments as they are the front-end of the company and responsible for payments.

3. To study and analyse lead time of marketing processes for Heat Exchangers and Reactors.

After receiving the RFQ, marketing team prepares ERER which is then transferred to each department along with the RFQ to send back data required to prepare Offer document. Each department takes their own process time to give the feedback.

Research Methodology:

The research methodology used in this project is both Qualitative and Quantitative for better understanding of processing time of various events conducted during the project execution in marketing and business development department of L&T Heavy engineering.

Research Design – Exploratory

Primary Data:

In-depth interviews – To collect primary data, series of interviews were conducted of 15 to 20 minutes with Deputy General Manager, Assistant Manager, and Sales Engineer etc. These interviews gave in-depth insights of different events of pre-order and post-order marketing process which is generally not recorded anywhere. The range of working experience of interviewees is varying from 1 year to 20 years.

Participant Observation – Another method were used to collect primary data is observation made by participating in work of various marketing events.

Secondary data:

For secondary data two equipment were selected from overall product portfolio, Reactor and Heat Exchangers. These two equipment are selected on the basis of frequency of the inquiries. Processing time data of pre-order marketing process is collected from Request for quotation (RFQ), internal inquiries, ERER sheet, DFS sheet etc.

Equipment orders have been selected irrespective of order won or order lost. The sample size for Reactor is 50 and for Heat Exchanger are 70. The orders are taken into account from FY17 and FY19.

Competitor's Analysis:

Assessment of competition –

Analysing Competition based on Porter's 5 Forces

1. Competition in the industry: L&T's heavy engineering has been facing rough weather for the past two years.

Level 1: (Big player having huge developed facilities)

Companies which are having high end skills, facilities, technological tie ups, strong proven track records. They are generally interested in high value items, large equipment, and critical metallurgy.

- L&T
- ISGEC
- Godrej and Boyce
- TEMA
- VTV (Vijay Tanks & Vessels)

Level 2: (Companies having medium level facilities)

These companies are generally interested in medium to large items, critical metallurgy, and high values item. They have comparable skills, track record and facilities. These companies raise

their capabilities and with some aggressive moves tries to compete with level 1 companies.

- HDOL
- GR
- Engineering
- Hindustan Radiators
- Fab Tech
- Precision Equipment

2. Potential of new entrants into the industry:

Lost order analysis reveals that small and medium category suppliers, currently in LEVEL-2 category giving stiff competition and to secure order, they need to squeeze margins. To enjoy comfortable situation and exploit niche market, these suppliers have to raise their capabilities comparable to LEVEL-1 companies, where they can secure orders with good margins.

3. Bargaining Power of suppliers:

Raw materials which are used to manufacture key equipments for Oil and Gas Refineries are generally not available in domestic market, 50% of the raw materials are imported due to which bargaining power of suppliers is significantly high.

4. Bargaining Power of customers:

There are majorly three PSU's in oil refining sector which are IOCL, BOCL, HPCL and many suppliers in domestic market such as L&T and ISGEC. Generally orders are given through a tendering process in which suppliers who bid competitively have higher probability of getting an order. So, the bargaining power of customer is more in this industry.

5. Threat of substitute products:

According to the pace of current technological developments, there may be replacement of Crude oil products with eco-friendly fuels in near future. Indirectly, this substitution can impact key equipment manufacturers of Oil and Gas refineries.

Summarizing, Porter's 5 forces tells us that though L&T Heavy Engineering is amongst top five companies in domestic market, due to bargaining power of customers and suppliers and many potential companies in level 2 segment (can become direct competitor in future) have to deliver products at competitive pricing.

On the basis of last orders by L&T Heavy Engineering, ISGEC and Godrej and Boyce are taken for competitor analysis.

Sr. No.	Variables	L&T Heavy Engineering	ISGEC	Godrej
1	Crane Capacity	Cranes of 230 MT	Cranes of 230 MT	Cranes of 175 MT
2	Rolling Capacity	Rolling up to 250mm	Rolling up to 250mm	Rolling up to 225mm
3	Dust free Environment for SS fabrication	yes	yes	no
4	Publicly listed	No	Yes	Yes
5	Certificates	U, U2, N, R, S, CE making, SQL approval	U2, U, S, R and NB, SQL, CE stamp	U, U2, U3, R, S, CE making, NBBPVI, SQL approval
6	Online RFQ process	It does not have option through which customer can directly send RFQ	It have very good interface where customer can fill information online and RFQ can automatically generated and segmented product wise	It only have provision to fill client information
7	Revenues	923 Cr	662.81 Cr	132.3 Cr
8	Rating (ICRA)	AAA	AA	A1- (short term)

These three companies are big players in both international and domestic market. They have similarities like:

- Overseas offices
- International collaboration
- Global supplier base
- High level Design head
- Sea going jetty
- Submerged arc welding
- Nozzle to head welding system
- RFQ handling system
- Bidding process
- ERP system

Observation:

- Though ISGEC & Godrej are listed on exchange, L&THE has highest revenues comparatively.
- According to ICRA, in long term, L&THE is more stable than the other two on the basis of their ratings.
- All the aforementioned companies follow entirely different procedures to fill RFQs for the same requirement.
- Along with other certificates all are U, U2, R & S certified. However, Godrej have NBBPVI certificate which other two does not have.
- Except Godrej, both L&THE and ISGEC provide for Dust free environment for SS fabrication.
- Godrej has slightly less manufacturing and rolling capacity than the other two.
- ISGEC have better and user friendly online interface to handle RFQ.

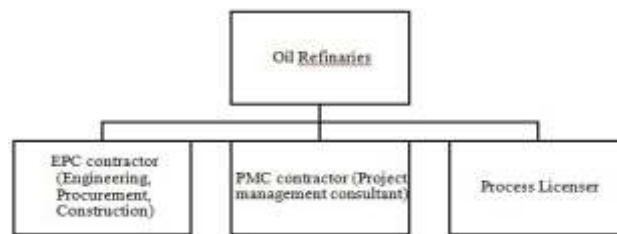
Note – From the marketing perspective effective online RFQ system is needed to simplify system and to develop user friendly experience for the new customers.

Process Mapping:

Marketing department's basic role is to book orders for the company, known as Order Inflow which sets the targets of profit margin. First preference is given to the negotiation with customers. If there is any genuine problem then only company asks for delivery extension which means customer will get the feasible time on which the delivery is to be collected.

There are different types of customers generally involved in each project. So, as a supplier L&T

has to take all of them into account and satisfy their requirements. Following flow chart is given for better understanding:



Pre-order process:

Request for Quotation (RFQ) –

This is the first step where client sends the inquiry as a request for quotation (RFQ) or request for proposal (RFP). In these product requirements are briefly given.

Prepare ERER –

It is the internal inquiry format which made by the details given in RFQ. This format is used to send inquiries in internal department for the development of project. Unique ERER is created for every project. It consist of unique Product Tags for every type of equipment with other details like quantity, material, dimensions, weight etc.

Delivery Forecast System (DFS) –

This is the type of inquiry sent by marketing department to DFS department along with ERER. The output from DFS department gives the idea about the delivery time of the project which is used to generate offer.

Legal Comments –

Along with the inquiry, client also provides legal terms and conditions which needs to be reviewed by company’s Legal Team to avoid future conflicts of interest between involved parties.

IDT –

IDT is Indirect Taxes. This inquiry is sent to IDT department to understand what indirect taxes will be applicable in execution of the project.

Foreign Exchange (FE) rate –

Marketing team requests for FE rates to Treasury department and the data given by them is then sent to Estimation team to predict future FE rates and transactional costs for procurement of raw materials.

Logistic Quote –

This request is sent to logistic department to understand cost of the transportation during the execution of the project so that it can be considered in the final offer.

Internal Quote –

Some parts of the project are developed in another facility of the company for which separate inquiry has to be sent to that entity which can be considered in the final offer.

Risk review –

This is a presentation conducted by a sales engineer to the upper management for decision making. During this process risk is analysed on the basis of technical and financial capabilities of the company for execution of the project.

If the worth of project is below certain limit, inquiries are regretted generally. Worth of project is considered on the basis of cost, weight, dimensions and material of the product included in the project.

Consolidate data –

All data mentioned above is gathered to develop an offer.

Prepare Offer –

After data Consolidation, offer is prepared for bidding.

Post-order process:Legal Review -

After getting an order, marketing department sends PO for Legal Review. Legal team checks for

any amendments (if required) and finalize the terms and condition.

Create Project and Contract on ERP - Marketing department creates project and contract No. in ERP with their unique ID which is required to keep a track of project from start to end.

Generate PLM project - After updating project on ERP, it has to be linked with the PLM software.

Conduct PAM - Marketing department conducts PAM meeting with the executives of different departments to introduce the project.

Upload Pre order corresponds - Pre order corresponds documents are then handover to PMG team and uploaded on PLM.

Kick Off meeting - Marketing executive has to participate in kick off meeting which is conducted with client along with PMG team in which client's major queries are solved.

Hedge request to treasury - To reduce the risk of loss due to FE rates fluctuation, marketing department sends request to treasury for hedging.

MS invoice - After receiving input from PMG department for milestone completion. Marketing department generates invoice against each MS completion and sends it to customer.

Payments claims to F&A - Received payments after follow-up's has to be claimed in F&A department by updating in ERP.

Billing break-up - Request is sent to client for billing break-up. After getting input from client it has to be updated in deliverables in ERP, which is approved by F&A department.

Deliverable for inspection - After approving

billing break-up, F&A department approves deliverables for dispatch which is sent to QA/QC department for QC clearance by marketing department.

Generate D-note and shipment number - These numbers gets generated after approval of QC department which is further approved by Department Head.

Generate tax invoice - D-note and shipment number is sent to the F&A for generation of tax invoice by marketing department. Payment collection - After sending tax invoice to customer, marketing executives follow up with payments.

Findings:

After receiving RFQ, Marketing department has to generate internal inquiries for other department which contains most of the similar information which leads to repetition of work. It was found that around 69.44 % of work is repetitive for generating different enquiries.

Almost all the pre-order marketing tasks are manual, due to which fluctuations in process time were found that could impact decision making.

There is no one assigned specifically for tracking internal enquiries movements and RFQ handling, so delays were found mostly because of priority issues.

In post marketing process, payments are claimed by the marketing department after getting inputs of MS completion from other departments. So, there could be chances of miscommunication or lack of complete information or clarity.

Another problem is quotation process is complex and dependant on various other departments. Due to wide range of products, tasks and responsibilities, to become skilled, plenty of time consuming training is needed.

Implementation Details:

The study and analysis can be used to track and find out causes of delays in pre and post order marketing process due to specific departments. As asked in the interview, there are standard numbers of days for each process to execute and forward the details ahead.

In this report, those deviations have been found out by analysing a sample from Heat exchanger and Reactor ERERs taken from the company's data source tracking each department's documentation procedure.

Also a Process Mapping model is prepared for the company's post order marketing process which I being implemented by marketing department to track each document.

Recommendation:

Redundancy of information that is used to generate internal inquiries; can be reduced by introducing software which can automatically generate half-filled formats of inquiries which can be further completed by marketing executive.

Similarly, department can take help of software for follow up of payments. This can include linking software with ERP system, keeping reminders and track record of payments done. This can give better clarity to top management about cash inflow of the company.

Future Scope:

If the previous mentioned limitations are removed, the data analysis and conclusion would be more precise if

- Data of longer duration can be used for analysis.
- Study can be conducted for competitors also.
- More data can be given by company for research.

Also, a relation between marketing process (pre and post order) and customer satisfaction can be

established. This research can be done using descriptive method, by conducting surveys amongst clients.

Conclusion:

In pre order marketing process, redundancy of information was found, this information sales engineer has to fill repeatedly for all internal inquiries manually.

Variance in process timing for sending inquiries from marketing department to various internal other departments were found. In post order marketing process, complications in invoice generation for payment collection system were found.

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Acknowledgement:

I am using this opportunity to express my gratitude to everyone who supported me throughout the summer project. I am thankful for their aspiring guidance, invaluable constructive criticism and friendly advice during the project work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project. I express my warm thanks to Mr. D. P Arora for her support and guidance at L&T Heavy Engineering. I would also like to thank my project guide Prof. Dr. G. Ramesh who gave me the encouragement to complete the project and supporting throughout the project.

A Study on Employee Retention

- Ms.Ashwini Kavali
(MMS II HR)

Introduction:

Retention means continuing to have the possession of something. Employee retention refers to capability of an organization to retain its employees. In today's competitive business world employee retention is a risk associated to every business/entity. Employee retention is crucial for any organization as to have a competitive advantage in the industry. There is no single employee retention strategy that can be practiced. To have best retention strategy an organization needs to understand the overall processes and drivers responsible for retention.

To understand what helps the retention of employees it is very important to identify the parameters responsible. Employee retention is an emerging issue and a workforce management challenge to the organizations. Organizations today need to adapt to the current dynamic work environment, especially in the uncertain economic environment.

This study focuses on technical employees of IRS. The key parameters have been identified with the help of literature review and management discussion. A total of 20 parameters were identified. The most important factors identified through management discussions were promotions and location of joining. The data required for this analysis was obtained from the employee database maintained at IRS. The sample size of this study was 283 (employees). The data was analysed by performing statistical tool- Chi Square Test. The results of this analysis thus revealed that the number of promotions received by an employee and location of joining are associated with employee retention. Also a

personal interview with the Vice President Human Resource identifies the existing factors contributing to employee retention at IRS.

Need for study

For any organization the employees are valuable assets. It is crucial for an organization to hire and retain the best talent for achieving higher productivity. Employee retention thus concerns with the policies and strategies adopted by an organization to retain the best talent.

This study aims to identify what are the reasons that keep the employee motivated to continue working for the organization. These reasons can be used to improve employee retention process and for formulating better strategies at IRS. For this purpose, the study explores and identifies the parameters that can be associated with retention of employees at IRS. These parameters having association with retention of employees can thus be used for framing better and improved processes and strategies for retaining the best talent.

Objectives of the study

- To find out the association between number of promotions and employee retention.
- To find out the association between location of joining and employee retention.
- To identify existing factors contributing to retention of employees at IRS.

Research Methodology

The Study Is A Descriptive Research. The population of this study were technical employees of IRS. For the purpose of data collection probability sampling technique was employed.

Research Tool: Chi Square Test

Sampling Method: Probability Sampling
 Technique: Sample no: 283

Data Type: Primary

STATUS	LOCATION AT TIME OF JOINING			
	HOME TOWN	OTHER	FOREIGN	
LEFT	42	80	5	127
RETAINED	38	117	1	156
TOTAL	80	197	6	283

Data Analysis:

H_a: There is no association between Number of promotions and Employee Retention at IRS

H_{a1}: There is an association between Number of promotions and Employee Retention at IRS

STATUS	NUMBER OF PROMOTIONS			
	0	1	2	TOTAL
LEFT	129	8	2	139
RETAINED	68	34	42	144
TOTAL	197	42	44	283

Table 2- Number of promotion Data

STATUS	NUMBER OF PROMOTIONS			
	0	1	2	TOTAL
LEFT	96.76	20.63	21.61	139
RETAINED	100.24	21.37	22.39	144
TOTAL	197	42	44	283

Sig. value 0.00

Table 3- Number of promotion * Status of employee test

Findings & Interpretations

1. Since the p-value $0.00 < 0.05$, the Null Hypothesis (H0) is rejected and Alternate Hypothesis (H1) is accepted.
2. The above results state that there is an association between number of promotions received by and
3. There is no association between location of joining and employee retention

Table 4- Location at time of joining* Status Data

Table 5- Location a time of joining*Status test

Findings & Interpretations

1. Since the p-value $0.031 < 0.05$, the Null Hypothesis (H0) is rejected and Alternate Hypothesis (H1) is accepted.

STATUS	LOCATION AT TIME OF JOINING			
	HOMETOWN	OTHER	FOREIGN	
LEFT	35.90	88.40	2.69	127
RETAINED	44.09	108.59	3.31	156
TOTAL	80	197	6	283

Sig. value 0.031

2. The above results state that there is an association between number of promotions received by and employee and employee retention.

Findings

Based on the hypothesis testing it can be found that since, p value is less than 0.05 value we Accept the Hypothesis for the System is unfavourable to the business process based on the 7S Framework.

Though the hypothesis proves that the system needs improvement, the responses received are not homogenous. There is a deviation in the perception of different element. The coefficient of variance thus calculated helps in understanding the heterogeneity in the responses.

Recommendations

Based on the discussions with the employees of IRS few recommendations are obtained. These recommendations were taken to understand the further improvements in policies and procedures followed by IRS.

- It is recommended that the company focuses on providing enhancement opportunities like promotions. Opportunities for progress and professional development should be planned.
- During the process of recruitment the company can ask a candidate’s preference location or choice of relocation.

- **Sourcing:** The key to success for retaining employees is when the company invests adequate efforts right from the initial stage or initial contact with the employee. An effective retention strategy starts from requirement i.e. the initial contact with any candidate. A candidate's commitment to any organization can be well measured by understanding the commitment to previous organization (in years of service) with them. Sourcing of candidates with relevant and stable experience of 3-4 years can be the first right step towards recruitment of any personnel.
- **Projection of Career Graph:** At IRS candidates are not only offered mere job opportunities but also career opportunities. One of the major reasons for turnover is better opportunity from external environment. Candidates here are provided with a projected employment view for professional development and success.
- **Employee Engagement:** There are few employee engagement events that are conducted at IRS. Increase in number of such events might help to reduce the gap between the top management and executives. The dynamic work culture today demands for work life balance and fun at work.
- **Flexible Work Hours-** IRS follows a policy of definite work hours of 8 hours & 30mins a day. Taking into consideration the travelling challenges faced by employees, they are provided with a flexible check in time between 9:00am to 10:00am. Any employee entering after 10:00am would be considered as late mark. There is no flexible work management policy to complete the definite work hours set by the company.
- **Work from Home-** at IRS there is no work from home policy. Due to the challenging and dynamic lifestyle adopted by the employees in cities, there is a need for work from home facility.

Limitations

- The data collected for the purpose of analysis was limited to only the technical employees of IRS. The data was collected from the database maintained by the company. The data was collected for all technical employees from 2006 to 2018; who were and are a part of IRS.
- The data obtained from company database was found updated on all parameters for the employees that were retained by the company. But the data on certain parameters was not found for employees that left IRS.
- The factors identified with help of literature and management discussion were selected depending upon the data available about the employee in employee database system.
- As the study focuses only on technical employees at IRS, no method of data collection could have been adopted for the purpose of analysis. Technical employees being posted at various survey stations (Ports) in India and out of India, the data collected was strictly limited to information available in employee database.

Future Scope

Further the research can be analysed using other significant variables affecting employee retention. This study can thus be adopted as a base for further research purpose. Other factors affecting employee retention can then be studied and examined on a broader aspect. Other factors like work life balance, organizational culture, transparency, compensation, flexible work management, etc. can be analysed. As this research concerns the classification industry further analysis can be made on related industries.

Conclusion

(Ruderman & Ohlot, 1994) states that promotions are a way of rewarding the employees which provides them advancement in their professional career. This can be used as a

tool for keeping the employee committed to the organization.

The study reveals significant association between number of promotion received by a employee and employee retention. Also, location of joining is associated with employee retention.

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Acknowledgement

The success and final outcomes of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is through such supervision and assistance and I would not forget to thank them.

I respect and thank Mr. Suman Jha- Vice president HR, for providing me an opportunity to do the project work in Indian Register of Shipping and giving all support and guidance, which made me complete the project work duly. I also thank Mrs. Deepa Suvarna- Manager HRD for providing the guidance, although they had a busy schedule managing corporate affairs.

I owe my deep gratitude to the entire HR team of Indian Register of Shipping, who took interest in my project and guided me all along.

I heartily thank my internal project guide, Prof. Vaibhav Kulkarni, for his guidance and suggestions during this project work.

A study on the effectiveness of e-Recruitment and HRM Software used by HR Consultancies

- Ms.Dhanashree Chavan
(P.G.D.M II HR)

Introduction:

Leon C Megginson describes the terminology Human Resource (HR) as “the total knowledge, skills, creative abilities and aptitude of an organization’s workplace, as well as the value, attitudes and beliefs of the individuals involved”. Electronic Recruitment (e-Recruitment) is also known as ‘online recruitment’ or ‘internet recruitment’. The Recruitment processes in which use of electronic resources, such as the Internet is used to achieve and improve the normal outcomes of recruitment by the organization is known as E-Recruitment. But even with the advancements of technology, recruitment is still a people business. And because direct people interactions can take a substantial amount of effort and time, processes supported with online technologies have added automation and efficiencies to the value-chain. This is where online recruitment software technologies excel and its immense value can be derived from them. Previously used manual systems are being gradually replaced by computerized HRIS. Computerization provides more accurate and timely data for decision-making. Recruiting software basically tends to the various recruitment procedures and entails automation for better performance levels in terms of hiring of new personnel to the respective organization. It harnesses the power of technological advancements for implementing the various processes involved in the recruitment category and hence creates a better standard of evaluation and assessment-based hiring systems for small to medium enterprises and even very large corporations also.

Features of Recruitment Software-

- Allows easy detection of duplicity and identity thefts as well as easy parsing of resumes for better extraction of candidate profile information.
- Facilitation for internal sharing of collective information for better analysis strategies.
- Visual representation strategies for better analysis of the business curve.

Some of the advantages of using a recruitment software is having a centralised database, increase in productivity of the recruiter, provides complete visibility & control and helps in streamlining the hiring process.

Companies and HR professionals have made great developments in the area of recruitment and candidate selection process over the years. Yet, the traditional recruitment process is still expensive and time-consuming for both employers and job seekers. The following are some common problems:

1. The complexity of data
2. Inability to filter resumes
3. Database and data mining

Resulting in heavy administrative workload, and the hiring expenses become higher and lead time is much longer.

Many companies are currently using online recruiting strategies. LinkedIn has created an easily accessible pool of candidates which allows recruiters to pre-screen potential hires due to the information available on the applicant’s profiles.

Need For Study:

e- Recruitment is the process of recruitment which is carried out using electronic resources, particularly the internet. Companies and External agents have made a headway for their recruitment process online so as to improve the speed by which candidates can be matched with the available vacancies. Today this process has become mostly digitalized because of advancement of technology.

The topic “A study on the effectiveness of e-Recruitment and HRM Software used by HR consultancies” has been chosen to study the way in which e-Recruitment contributes in facilitating ease in building and managing database of received applicants in the Applicant Tracking System (ATS) as compared to the traditional – (manual) method where the recruiters have to manually type all the details of the candidates and maintain the entire database. ATS acts as a repository. Another reason for choosing this topic is to understand how Artificial Intelligence (AI) and Machine Learning (ML) can help the recruiters smoothen the hiring process (recruitment) in their organization since adopting modern methods as “Automation” is the future.

Objectives of the Study:

- To study the HRM Software ‘FastCollab’ used at SKS Enterprises
- To study the various sources and tools used in e-Recruitment
- To identify areas of improvement and suggest measures in the recruitment practices followed by the organization

Data Collection:

- Primary Data - Primary Data is collected using a structured questionnaire.
- Secondary Data - The secondary data for this research work is obtained from the Company’s website, Knowledge repository/Academic databases like Research

Gate and Google Scholar.

Data Analysis:

The questionnaire consisted of 15 questions and focused on the HR professionals only. It included questions like their total number of years of experience in the field of HR, if their organization is using traditional or modern method of recruitment, the modules used in the software, limitations in the current software, challenges faced while shifting from a traditional method to modern method of Recruitment Etc.

Findings & Interpretation:

- The analysis carried out in the survey reveals that the majority of the respondents (56%) use modern methods of recruitment and about 59% of the respondents have a work experience in the field of Human Resource for less than 5 years
- 46% of the respondents said they use a blend of different channels to source the right talent – like Job Boards, External Consultants, Employee Referrals and Web 2.0 tools
- 34% of the respondents rely heavily on LinkedIn for posting new job vacancy, whereas 32% of the respondents use a blend of channels like Social Media Sites like Facebook, Twitter and Instagram, Forums and Microblogs as a source as well for posting job openings.
- Majority of the respondents (50%) said they screen about 100 – 500 resumes in a month
- 22% of the respondents take up about a month to close one particular position, 17% of respondents take 2 weeks whereas 10% of the respondents are of view that closing of the position completely depends on the Urgency and the position itself (Junior or Senior role)
- Screening and checking the skill mapping and authenticity of millions of resumes is a problem and time-consuming exercise for organizations.
- Major respondents of the population i.e. 44%

of the respondents do not use any HRM Software in their organization; which means they still follow the traditional method and processes in their workplace

- Whereas, 15% of the respondents use HR Mantra as an HRM Software in their organization, followed by 13 % Zoho Recruit, 10% Talent Recruit, 7% FastCollab, 6% Oracle Taleo, 5% Hirecraft
- 16% of the total population has been using the HRM Software in their organization from 2-3 years, whereas 15% of the respondents have been using the software for over a year and 12% of the respondents have been using the software in their organization for less than 6 months which means their organization is moving up the ladder and adapting the modern way of handling HRM processes and activities
- Only 7% of the respondents have been using the HRM software for more than 3 years
- 29% of the respondents were given On-the-job training as an assistance to understand and learn the know-how operations of the HRM Software that they were going to use their organization, whereas 27% of the respondents were given a Classroom training. None of them were given Off-the-job training.
- Out of the total population, 31% of the respondents use only the 'Recruitment' module of the HRM software in their organization, whereas 16% use a blend of both Recruitment and Payroll Processing modules for their organization. 6% of the respondents uses only Performance Management module and 3% make use of only Payroll Processing module.
- 40% of the respondents is of strong view point that e-Recruitment helps in facilitating ease in building and managing database of received applications whereas 24% only agree to the fact and 4% of the respondents had a neutral opinion on the subject; meaning neither they agree nor disagree on the subject matter.

- 40% respondents hold a strong opinion that 'Large data set' is one of the major challenge faced by the organization and its people while shifting from a Manual Process to an Automated Process, whereas 29% of the respondents feel that 'Money Factor' can be a challenge, 16% of the respondents are of view that 'Technical Competence' could also be another challenge and 15% of the respondents believe that 'Adaptability' can be a challenge
- When asked about the limitations of the current software which is being used by them in their organization, 10% of the population says their software 'Lacks Analytics', 9% of them are of view that their software has 'Less Modules', 5% of the population has an experience of their ATS not being 'User Friendly', 8% of them have no issues with the software that has been used by them in their current organization

Recommendations:

- SKS Enterprises should make use of Job-fairs for creating awareness about the job vacancy the firm is working on
- They should expand their team-base; as of now they are a micro enterprise consisting of only 6 employees, having worked on various profiles of IT and Finance domain during my tenure with the company, it was observed that among the team members many profiles are given to them to work on, and sometimes because of the work-pressure, the productivity goes for a toss.
- The workflow pattern followed by the company is something that should be worked on. An employee is given 3 profiles to work on at the beginning of the week, which is later taken up by another employee for the next two days of the week.
- My observation for this pattern was – the employees spend too much of time coordinating with each other just to know about the updates and current statuses of the

candidates shortlisted or lined up for any interviews. Half of the day goes by taking only the status updates and rest of the work automatically comes at a standstill; for which the employees have to stay back late hours to finish the tasks.

- It is highly recommended that the person who is working on a particular profile shall close the same; as he/she knows in-and-out about the entire profile, be it the job description, requirements of the clients or any interviews that are lined-up with the client.
- For internal hiring, the company looks out for freshers or even candidates with work experience but their salary band is too low due to which they are unable to retain the employees.
- During my tenure, I had observed candidates joining on a particular day and leaving the organization the very next day.
- It is recommended that the company should look into their Pay structure policy and retention strategies and recruit candidates who are serious about the job and fit-in the company's culture.

Limitations:

- The analysis of the results concluded interesting discoveries; however, the sample size and reach were not large enough.
- The sample size is 68, which is actually small for this survey as there is a huge population of HR Professionals working across the industry which could not participate, contributing to the lack of sample
- Respondents might have been biased while answering to the questions of the survey
- The software 'FastCollab' used by SKS Enterprises is highly prone to technical glitches and can in fact, at sometimes, lead to potential loss of important hiring data.

Future Scope

- A feasibility study can be done for the HRM

Software 'FastCollab' used by SKS Enterprises.

- Features like Assessments, Background Screening and 'On boarding' can be implemented for more effective usage.
- The idea is to introduce more features in order to function seamlessly and also compete with its competitors in the market.
- Each new feature will have specific importance and the internal recruiter team will be able to work on it saving the client's time.
- Technical feasibility areas could be further explored in terms of the front-end and back-end technologies which provide a way to preserve the accuracy, reliability and ease of access and data security.
- For affirming that the system is economically feasible, the benefits obtained from it has to be rated against the cost incurred to actually develop the system.
- There should be sufficient support for the project from the management team and from the intended users of the system.

Conclusion:

Recruitment tools has indefinitely facilitated the cut-down of a lot of manual operations in terms of the various sub-processes that are related with hiring and recruitment. The recruitment tools are also very important for enhancing the current hiring processes of existing businesses in the market. Traditional methods should not be replaced by the e-recruitment. The loopholes of e-recruitment can be protected by the traditional methods and recruitment process will be faster, global due to e-recruitment. One method should not replace the other.

For example - When there are two vacancies and two candidates are available, the companies do not have much choice, thus they prefer to widen their search and attract abundant applications. But when for two vacancies a company receives 2000 application, the in-depth screening process

is not possible and manually it can be never-ending.

With the implementation of the various technological innovations and extensive creative solutions, this software stands to create great potential standards when it comes to hiring the best and the most creative talents in the Industry for the Organization.

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Acknowledgement:

This report is an outstanding prospect to convey my gratefulness to those many people whose timely help and guidance went a long way in finishing this project work from commencement to achievement.

I owe my sincere gratitude to SKS Enterprises for providing me with the opportunity to undergo a summer internship training with the firm. It was a great learning experience.

I am extremely thankful to my project guide Prof. Vaibhav Kulkarni for his valuable guidance and also for his support in completing this project.

A Study on Optimization of Time and Motion

- Mr. Nitin Gowda
(MMS II Operations)

Introduction:

Within every organization there are common business processes designed to meet objectives. However, for any number of reasons, some of these processes may be slow, inefficient, unreliable, duplicative and redundant.

Arihant was founded in 1978 with a desire and focus to service the global marketplace with highly innovative products and services. Arihant has since evolved into a full range of Playground equipment, Water Park Equipment player, while it also owns and operates its own Water Park called 'The Great Escape'

Engaged in manufacturing and supply of water park equipment, Arihant has evolved into a one-stop shop for providing comprehensive quality services.

Labour hour rate is a cost rate which is used in absorption costing to charge the overheads of a department or cost centre in the cost of production or job. It is usually used for those departments or cost centre which are less mechanized, and is computed by dividing the budgeted overheads which have been assigned to the department or cost centre by the estimated total number of labour hours for the period, to arrive at a rate per labour hour.

The principle for finding out direct labour rate is same as that of machine hour rate. Attempt is made to allocate the various factory expenses to the various categories of workers. Each category of workers needs more or less supervision, causes different measures of wastage of materials or wear and tear of tools.

(1) Ordinary Machine Hour Rate:

This rate takes into account only those overhead expenses which are variable and directly attributed to the running of a machine. Such expenses are power, fuel, repair, maintenance and depreciation. The total of all these expenses is divided by the total machine hours.

(2) Composite Machine Hour Rate:

This method takes into account not only expenses directly connected with the machine as mentioned above, but also other expenses which are known as stand- \bar{u} ing or fixed charges. Such expenses are rent and rates, supervisory, labour, lighting and heating, etc. These expenses being fixed in nature are determined for a particular period and then apportioned among different departments on some equitable bases.

Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. It is used in those industries or departments where machinery is predominant and there is little or practically no manual labour. In such industries or departments, overhead consists of indirect expenses in running and operating the machine.

Need for study

The company is rapidly growing as a medium enterprise, the company needs to increase profit for the year. So, this study "Optimization of Time & Motion" will help the company to optimize the cost of manufacturing products. There was a need to study about the cost of each product, to study time required to make that product and to analyse the labour cost and machine cost.

LHR (Labour hour rate): Unit of work that represents the productive effort of one person in one hour--also called man hour. LHR is used to calculate the labour cost inculcated per product manufactured by the company. It determines the cost of the product.

MHR (Machine hour rate): Machine hour rate is a rational method for absorption of factory overhead. The factory overhead costs are allocated to a machine or a group of machines doing the same type of job and the cost per hour of the machine is ascertained dividing the total allocated overhead costs to the machine by number of hours the machine worked during the same period of time for which the costs have been considered.

Objectives of the study

- To calculate the labour cost per product.
- To analyse the utilization of the machine in terms of its cost.
- To determine the optimal time required to manufacture a particular product.
- To create a database.

Methodology

The method followed is a case study method, A case study is a research methodology that has commonly used in social sciences. It is a research strategy and an empirical inquiry that investigates a phenomenon within its real-life context. Case studies are based on an in-depth investigation of a single individual, group or event to explore the causes of underlying principles.

It is a descriptive and exploratory analysis of a person, group or event. It can be single or multiple case studies, includes quantitative evidence, relies on multiple sources of evidence and benefits from the prior development of theoretical propositions.

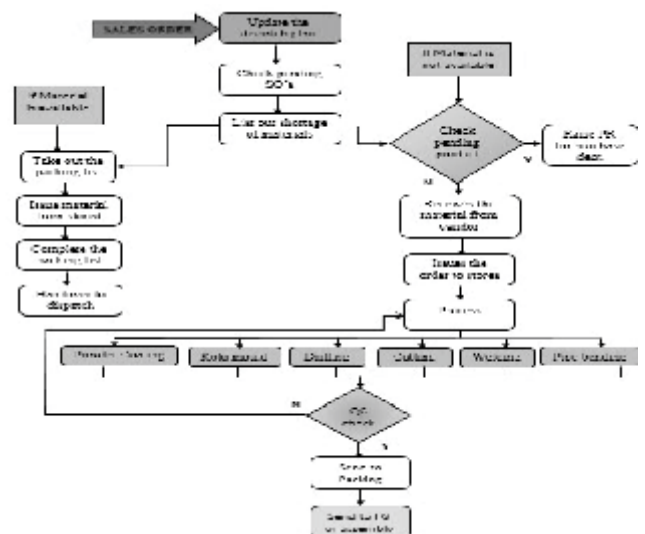
Case studies are analysis of persons, groups,

events, decisions, periods, policies, institutions or other systems that are studied holistically by one or more methods.

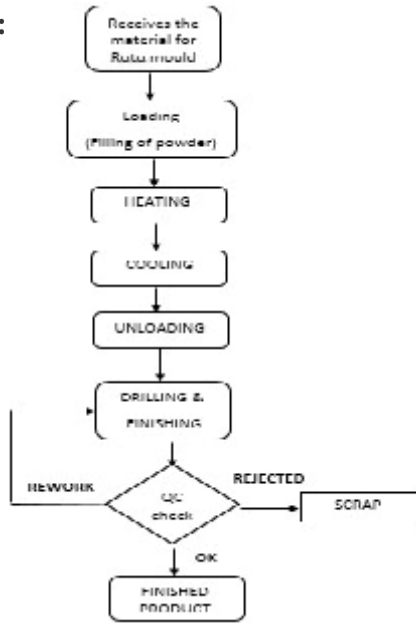
5 department plans:

- 1. Roto Moulding-**
The process begins with filling a hollow mould with a pre-determined quantity of LLDPE powder.
- 2. Bending-**
Pipe bending as a process starts with loading a tube into a tube or pipe bender and the forming die. The tube is also loosely held by two other dies, the wiper die and the pressure die.
- 3. Welding-**
To join (metals) by applying heat, some times with pressure and some time with an intermediate or filler metal having a high melting point.
- 4. Drilling-**
Drilling is a process of producing round holes in a solid material or enlarging existing holes with the use of multi-tooth cutting tools called drills or drill bits.
- 5. Cutting-**
It is a mechanized industrial process that removes material from pipe or tube to create a desired profile.

Process Chart



Roto Moulding:



The process begins with filling a hollow mould with a pre-determined quantity of LLDPE powder. This powder can be pre-compounded to the desired colour. The oven is preheated by convection, conduction, to temperature ranges around 300 °C - 330 °C. When the powder is loaded into the mould it is closed, locked, and loaded into the oven

LABOUR COST	BLUE COLLAR	CONTRACT
PER MONTH	20000	-
PER DAY (26DAYS)	769.2307692	350
PER HOUR (8HRS)	96.15384615	43.75
PER MIN (60MIN)	1.602564103	0.729166667

Table: 1.0

The above table shows the salary of blue collar and contract workers i.e. day wise, hours wise and minute wise.

$$LHR = \text{total time} ((\text{no. of blue collar} * \text{amount/min}) + (\text{no. of contract worker} * \text{amount/min}))$$

There are basically 4 steps to complete moulding process

- Heating
- Cooling
- Loading & unloading
- Drilling & finishing

Each process has different time depending on the product, but heating and cooling remains same i.e. 20min for all the product.

Description	SMALL M/C(HP)
1 SHAFT	2
2 SHAFT	2
3 SHAFT	2
BLOWER	5
MOVEMENT	5
TOTAL	16
HP TO KW	11.9312

Table: 1.1

The above table shows the machine description that is hp of different kind of motors used in machine. When a mould is loaded and goes for heating process it requires total of 12hp i.e. 1 shaft (2hp), blower (5hp) and movement (5hp). After heating the mould is ben cooled in a linear manner that time it requires total of 2hp i.e. only the shaft movement (2hp). HP (horse power) is converted in KW/hr (kilowatt/hr)

$$1HP = 0.7457 KW$$

and the price of 1 KW\hr is Rs 11.4

During heating process gas consumption is been used that is 6.5kg of gas/cycle

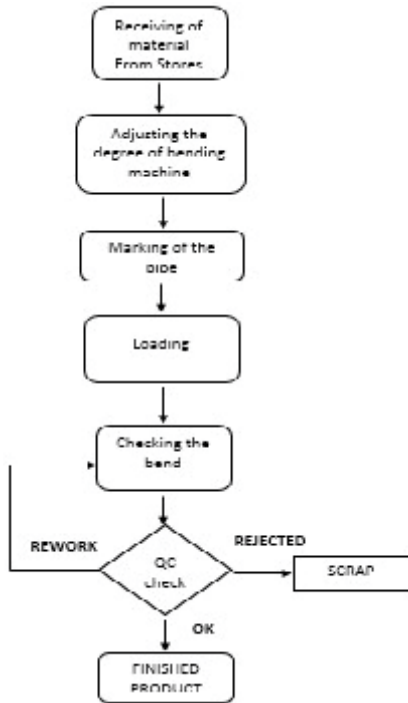
M	WEIGHT (20MIN)	RATE (1450/33)	AMOUNT/ PROCESS	AMOUNT PER GM (6200KG)
GAS	6.5	48.33	314.1	0.050672043

Table: 1.3

The above table shows the weight of gas consumed per process and the rate of gas for per process.

$$MHR = \text{Heating} + \text{Cooling} + \text{Gas}$$

Bending:



Pipe bending as a process starts with loading a tube into a tube or pipe bender and clamping it into place between two dies, the clamping block and the forming die.

The tube is also loosely held by two other dies, the wiper die and the pressure die.

LHR= total time ((no. of blue collar * amount/min) + (no. of contract worker*amount/min))

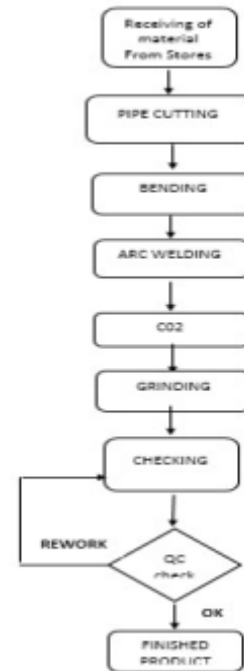
	M1	M2 (RING)	M3(80NB)
TOTAL	3	5	10
HP TO KW	2.2371	3.7285	7.457

Table: 1.5

The above table shows the 3 different machines used for bending and there HP. The HP is converted into KW depending on the bend machine is used. So my work is to find how many minutes it requires to make single bend and to find the machine cost of that particular product, 1HP = 0.7457 KW and the price of 1 KW\hr is Rs 11.4. Manual bend doesn't requires any machine cost, remaining other 2 bends has

machine cost. The machine cost is calculated as $MHR = ((\text{Machine's KW/Hr.} * \text{Cost of 1 Unit})/60) * \text{Time Required to Complete That Task}$

Welding: Labourer here is basically of 2 types blue collar (permanent) and contract based. Blue collar are paid on monthly basis i.e. Rs 20,000/month and contract workers are paid on daily basis i.e. Rs 350/day.



To find out the labourer cost per product, have taken the salary of labour/minute and multiplied with the time required to make that product, which will give me labour cost of that particular product.

LHR= total time ((no. of blue collar * amount/min) + (no. of contract worker*amount/min))

For the welding process we require 5 machines to do 5 different tasks.

- Drilling machine
- Arc machine
- Grinding machine
- CO2 machine
- Cutting machine

	Drilling	ARC	Grinding	CO2	Cutter
KW	3	7	0.7	9.2	2
Price	0.57	1.33	0.133	1.748	0.38

Table: 1.7

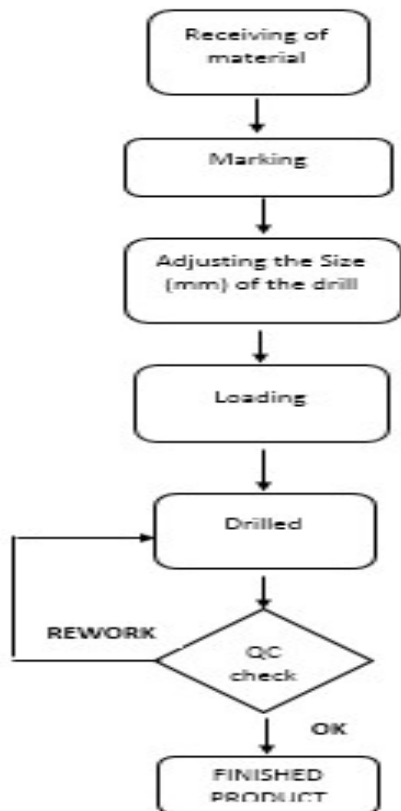
The above table shows the 5 different machines used for bending and there HP. The HP is converted into KW. Depending on the machine used for that particular process. So my work is to find how many minutes it requires to make single product and to find the machine cost of that particular product,

$$1\text{HP} = 0.7457 \text{ KW}$$

and the price of 1 KW\hr is Rs 11.4.

$$\text{MHR} = ((\text{Machine's KW/Hr.} * \text{Cost of 1 Unit})/60) * \text{Time Required To Complete That Task}$$

Drilling:



Drilling is a process of producing round holes in a solid material or enlarging existing holes with the use of multitooth cutting tools called drills or drill

bits. Various cutting tools are available for drilling, but the most common is the twist drill.

$$\text{LHR} = \text{total time} ((\text{no. of blue collar} * \text{amount/min}) + (\text{no. of contract worker} * \text{amount/min}))$$

	Drilling
KW	3
Price	0.57

The above table shows the machine used for drilling and there HP. The HP is converted into KW. Depending on the machine used for that particular process. So my work is to find how many minutes it requires to make single product and to find the machine cost of that particular product,

$$1\text{HP} = 0.7457 \text{ KW}$$

and the price of 1 KW\hr is Rs 11.4.

$$\text{MHR} = ((\text{Machine's KW/Hr.} * \text{Cost of 1 Unit})/60) * \text{Time Required to Complete That Task}$$

Findings and Observations

- The MHR and LHR of each component is been calculated and it is observed that there are many process which can be improved
- It is also observed that the cost of each product was not there, they had a thumb rule to cost the product.
- The time taken for completion of each item was also calculated. This can be used for further improvements in the process by optimizing time.
- The AICL Company has a lot of documentation.

Limitations

1. Due to variation in efficiency of labour and machine time variation can occur.
2. This errors of human and machine can lead to large variation in time study.
3. Errors in cost estimation may lead to errors in

quoting the price of components which may lead to reduction in profit.

4. Errors in time scheduling can affect the efficiency of the company.
5. Inflation can affect the cost of labour hour and machine hour largely.

Recommendations

1. Manual machine requires 4 to 5 labour to bend a pipe, so automatic bending machine has to be installed to reduce the labour cost.
2. The balance between labour hour and machine hour should be calculated in order to achieve cost optimization.
3. To maintain a daily report of utilization of resources and all activities.
4. Soft copy of all the data can be maintained with proper backup.
5. Improve the infrastructure and facilities provided to the employees

Conclusion

It is concluded that many processes in AICL can be improved by using LHR and MHR calculation done in this study. The LHR and MHR calculation would help in process, cost and time optimization.

LHR can help as a data for labour turnover in the company. This will also prove beneficial in finding out overload and under load in work of labour. MHR can help us in finding machine productivity and efficiency. It will also help in finding out bottlenecks in processes, where machines are used.

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Acknowledgement

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. I respect and thank Mr. Mithun Mandal, for providing me with an opportunity to do the project work in Arihant Cooperation Private Limited and giving us all support and guidance which made me complete the project duly.

I heartily thank my internal project guide, Dr. Sinimole, for her guidance and suggestions.

Design and Development of a Web Portal for the HR Department at ICS Group

- Mr. Brendon D'Souza
(M.M.S. II – I.T.)

Introduction:

A Human Resource Management System (HRMS) is a system that helps to automate and manage the manual processes followed by an organization. It uses a combination of hardware and software components that contain all the various business logic implemented by the HR department of the organization. An HRMS is also known as a Human Resource Information System (HRIS).

In this project, a Human Resource Management System (HRMS) was designed and implemented through a Web portal for the ICS Group of companies. This HRMS (ICS Portal) is used by the employees of the organization to monitor their daily attendance, as well as to keep a track of their leaves. The portal further helped the HR department to move out of the manual process that they had been following and settle into a more automated process that helped reduce their time and effort and provided them with quality results.

Microsoft Visual Studio 2015/2017 and Microsoft SQL Server 2014 has been used to develop and bring out ICS Portal to each and every employee within the organization. Here, Microsoft Visual Studio has been used to provide the interface as well as the logic required to run the Web Portal whereas MSSQL 2014 has been used to provide the database required to store the required data received from the portal. A number of combinations of code and interface was used to determine the best possible product for the employees.

Drawbacks of the existing system

A common HR department would share the HR functions of four companies under ICS group. The processes followed by this department were pen and paper based, due to which the employees were extremely habituated to the system. This pen and paper based system lead to inflexibility within the employees towards adopting other readily available off-the-shelf management systems as they did not exactly replicate their system.

A manual and tedious process was followed by the HR department employees to keep track of employee's leaves, in that the employees were required to fill a leave application form that was provided to them via. Microsoft word. This form was then sent as an e-mail to the HR department. At the end of each monthly attendance cycle (21st-20th), the HR department received an excel spreadsheet containing the 'In and Out times' for each employee from ESSL (company providing bio-metric machines), after which an HR employee was assigned to sift through the various pre-received e-mails and then the HR employee was required to make a note of which employee had taken a leave on which particular day. After this was done, the HR used Microsoft Excel to calculate the total monthly duration a particular employee had worked and also note the count of each of the different types of leave requests applied by an employee.

Need of the study

- Understanding & Automating the Leave Management Process of HR Dept. at ICS Group using a Web Portal

- Providing One Click Access to Employee Leave Data and related Reports

Objectives

- To Design Front-End Interface of the Leave Management Portal for HR Dept. at ICS Group
- To Design and Implement the Backend Databases used for the Leave Management Portal
- To Design the User Manual for the newly developed Leave Management Portal

Methodology

- Research Design: Exploratory Research
- Data Collection:
 - Secondary Sources: Company Websites, Procedures, Books and Articles
 - Primary Sources: Interview with Sr. HR Executive and Executive Analyst and Observation Techniques

About the Proposed Portal

ICS Portal will provide the organization with a swift, efficient and interactive way of overcoming the previous manual approach, by enabling the users to apply and track their leaves over the web. The focus of this portal is to eliminate the extra amount of paperwork that the HR department has to maintain as well as enabling the employees to maintain a record of their own leaves and update their attendance accordingly at the click of a button.

A basic user interface is designed so that it becomes easy to understand the way the portal functions. The portal will provide the employees with pre-created accounts where, in case of any issues, the employees will be provided with an option within the portal itself to submit their queries/grievances to the admin of the system. These accounts will be provided with additional security in the form of a One Time Password (OTP) that will be generated and sent to the employees company

assigned e-mail ID's every time they need to access the portal.

ICS Portal will also help the HR department maintain the data of all the employees of the organization (past and present), as well as, help them maintain a secondary reserve of data by sending an email to the employee, their manager and the HR department respectively, whenever a leave application is submitted. Also, employees will be provided with a quick view of all their applied leaves through a series of colour codes projected on the calendar present on the respective employee's home page as well. The attendance of an employee will be updated by cross checking the dates where the employee will remain absent with the days that he/she has applied for leaves.

ICS Portal will ensure complete segregation of all three users i.e. Employee, Manager and HR and will also provide the employees with customized forms for the eleven different leaves types respectively, thereby eliminating the scope for any contradictory/unnecessary details. A success message will be displayed at the end of each successful leave submission. Also, users will be notified though a pop up message on screen if data is unavailable for any specified request. All these records can be retrieved by the employee from the database as and when required.

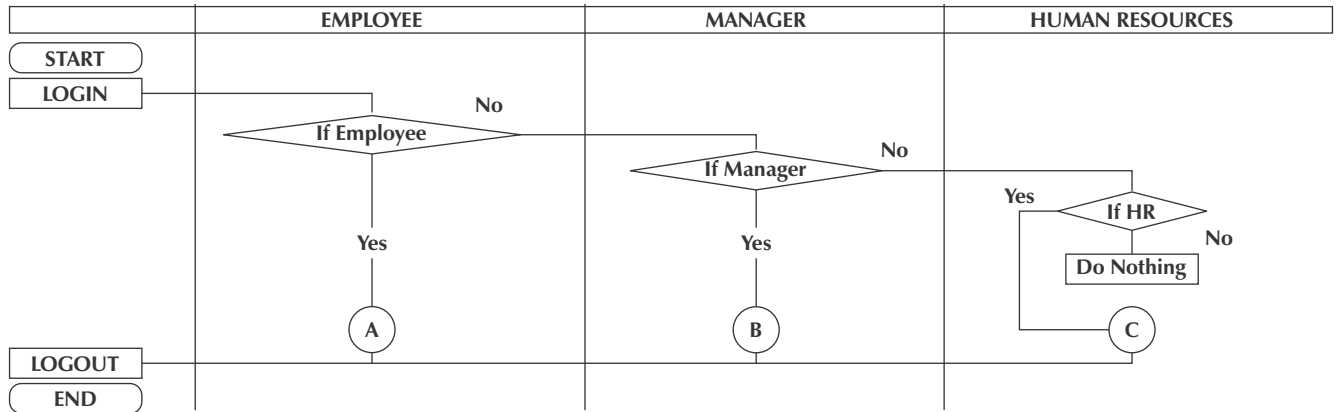
The manager would similarly be able to retrieve his own leave records as well as those of all the employees reporting to him/her, hence providing him/her with a quick overview of the regularity of the employee. The HR department would be able to view the same, however HR employees will have access to leave records of all the employees in the organisation as and when the need arises.

An Employee's leaves will accrue once in a month as specified in their leave policy and their

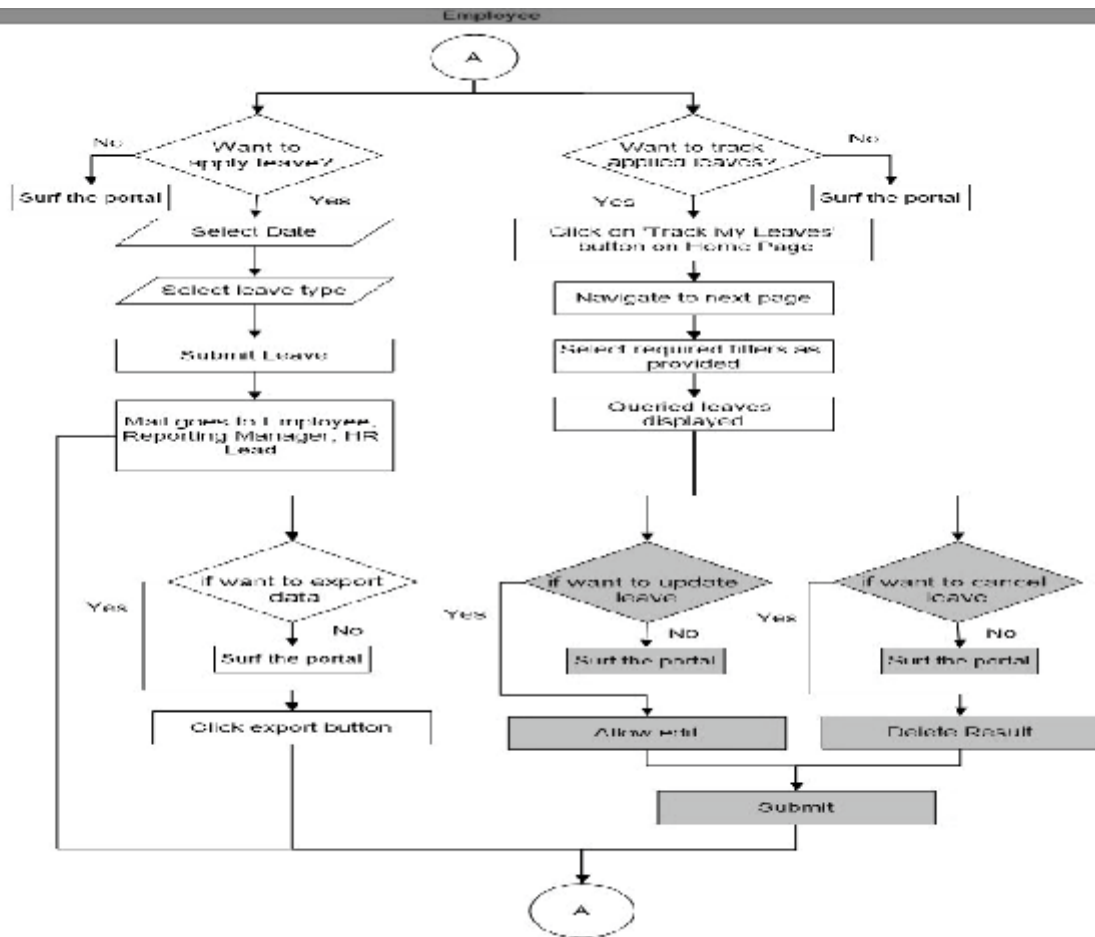
attendance status will update accordingly each time they access the Web Portal. Also, it is to be noted that, as per the instructions given by the organization, the portal will impose a restriction on the number of times certain specific leaves can be availed after which the particular leave type will not be available for application for the remainder of the month.

Employees will also be provided with the facility to download their Form 16 document and submit their Mediclaim information through the portal, thereby reducing the amount of paperwork and physical space utilization for said paperwork.

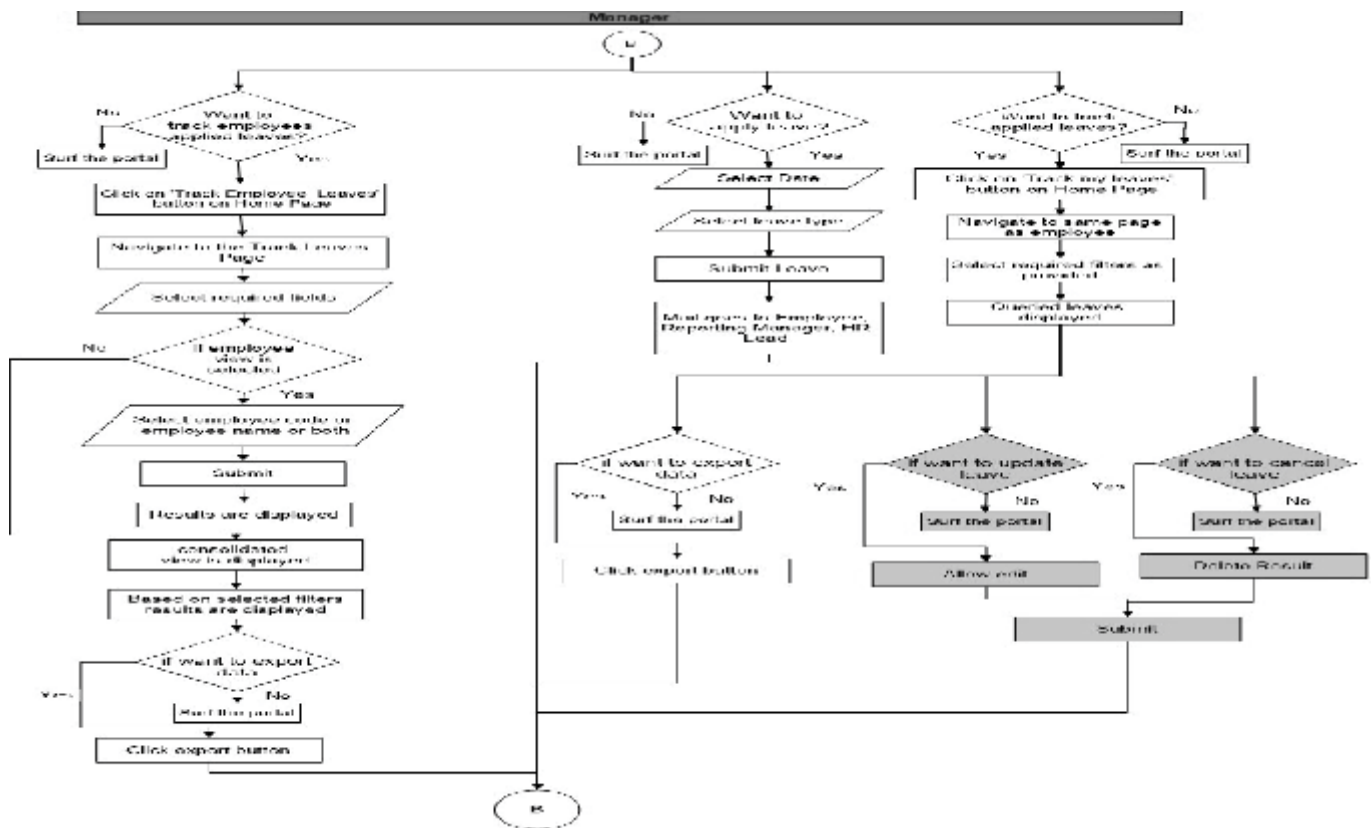
Process Map



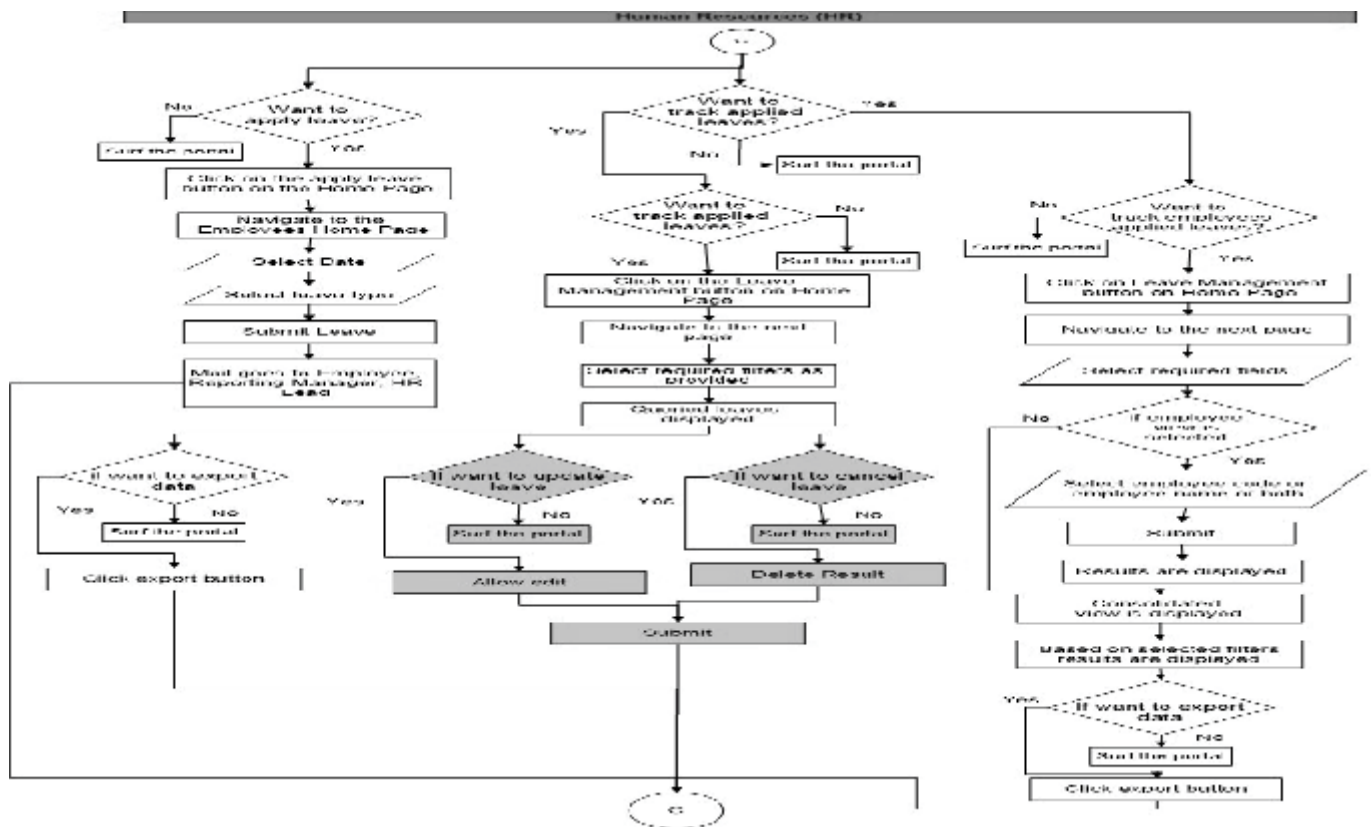
Process Map – Overview



Process Map – Employee



Process Map – Manager



Process Map – HR

Technical Requirements

➤ Software Used



- Microsoft Visual Studio 2017 Community – Asp.Net with C#
- Microsoft SQL Server 2014.
- Windows 7 and above
- Any Web Browser

➤ Hardware Requirements

- Minimum 4 GB RAM.
- Minimum 5GB Hard Disk Space
- Processor - Intel i3 and above
- Others - Monitor, Keyboard, Mouse.

➤ Additional Packages

PDFsharp

PDFsharp is the Open Source .NET library that helps creates and processes PDF documents on the go from any .NET language. The same drawing routines can be used to create PDF

documents, draw on the screen, or send output to any printer.

TimePeriodLibrary.Net



The TimePeriodLibrary. Net is an external Dynamic Link Library (DLL) file that is used to perform calculations over specified time period variables as well as on individual calendar periods.

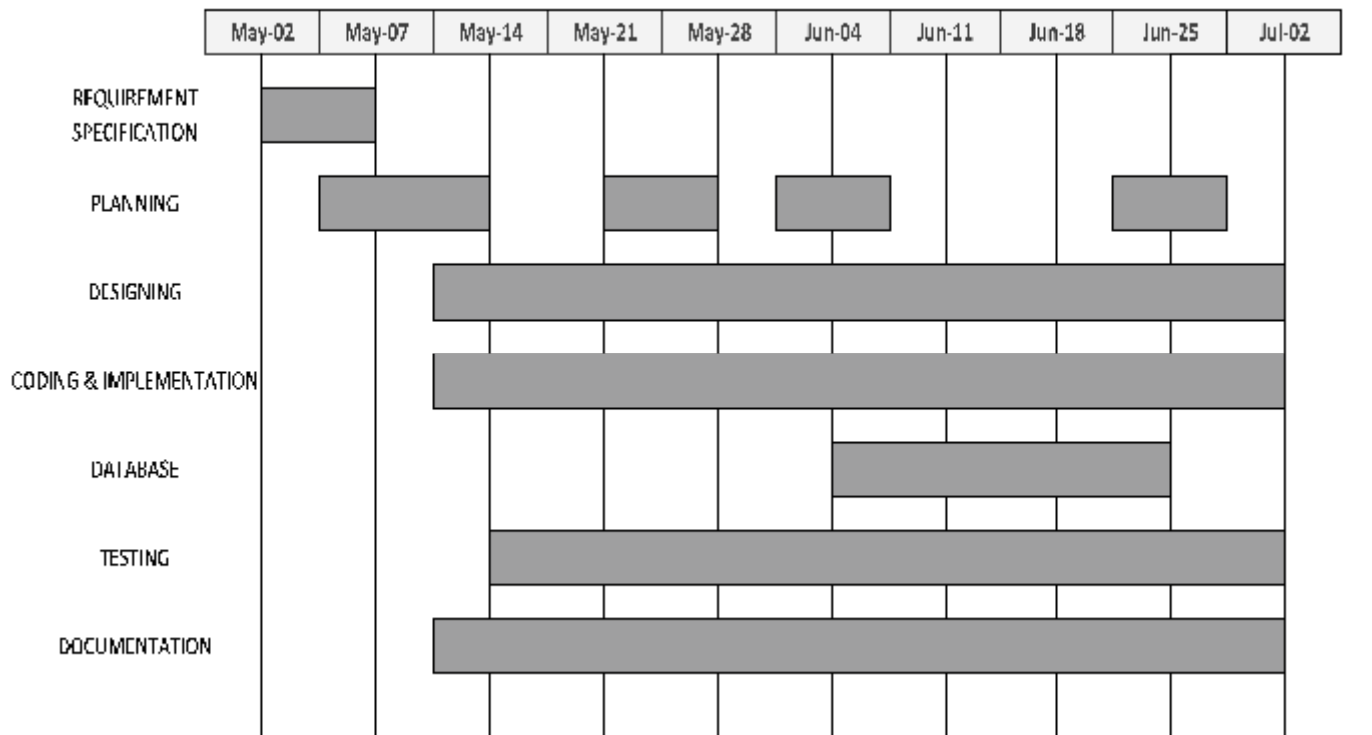
AjaxControlToolKit



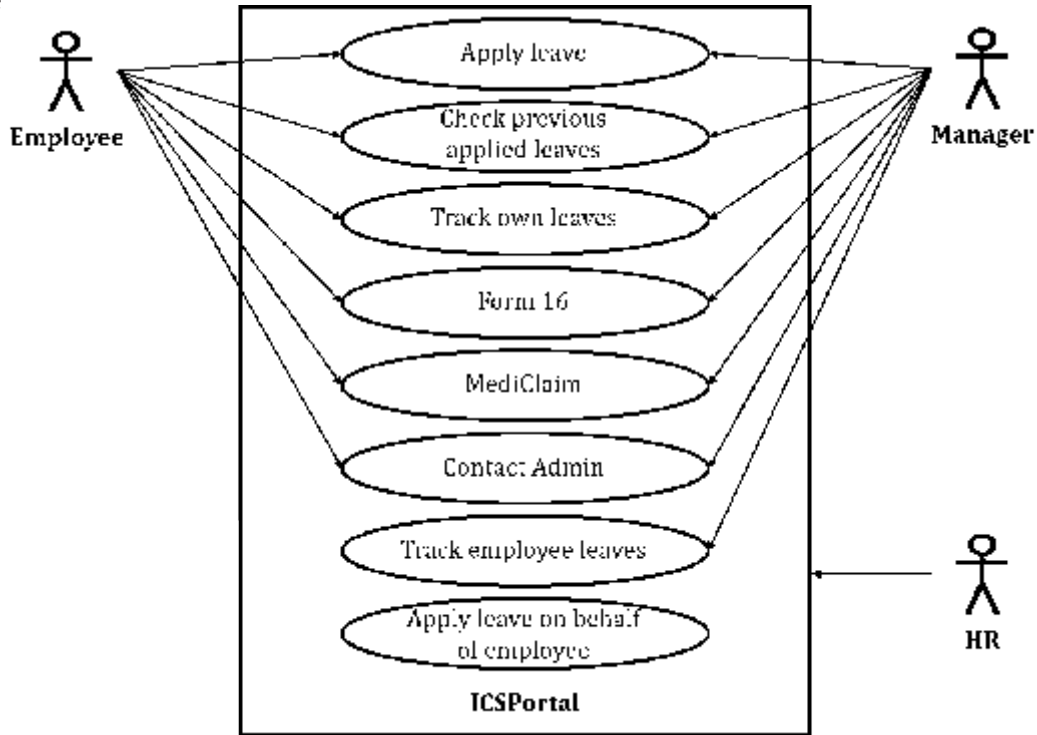
The Asp.Net Ajax Control Toolkit is an open source library provided by DevExpress that provides reusable, customizable and extensible Asp.Net Ajax extenders and controls that can be used to create dynamic and interactive web pages. It currently provides over different 30 controls.

Leave Management Module Designing

➤ Gantt Chart



➤ Use Case



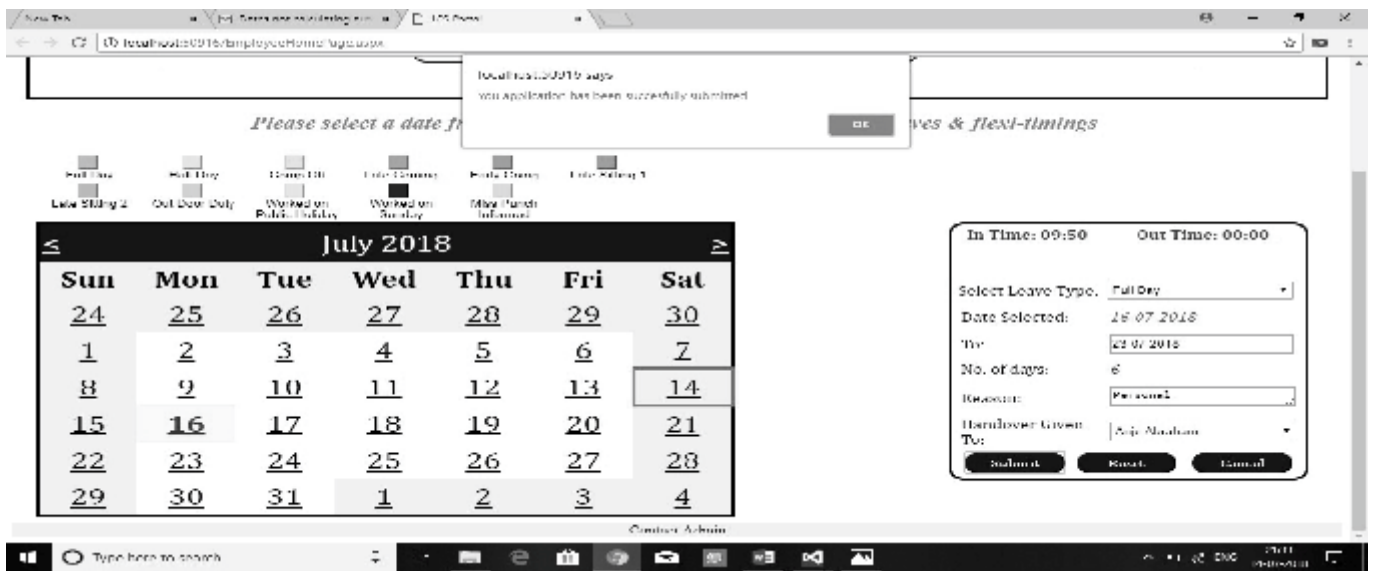
The Use Case diagram indicates the various functions that can be performed by each user. The 'Employee' can apply for a leave, check previously applied leaves, track his own applied leaves, download both parts of the form 16 document, fill MediClaim details and report any queries/grievances to employees. The 'Manager'

can perform all of the above functions along with an additional function i.e. tracking the leaves of the employees working under him/her. The 'HR' has an additional function of applying a leave on behalf of the employee along with all the above mentioned functions.

➤ Screenshots



Login- Details & OTP



Employee Home Page– Leave Submission Confirmation

Leave Management

Name: Manoh Tewari Employee Code: 4525 Company Name: PZ

Select Leave Type: Full Day
 Monthwise Attendance: July Yearwise Attendance: Select

Submit


Emp Code	Department	Location	Leave Type	From Date	To Date	No of Days	Reason	Handover Given to	Application Status	Application Submitted on	Reason for Decline
4525	HR	HC, Mumbai	Full Day	21/06/2018 00:00:00	21/06/2018 00:00:00	1	N/A	N/A	Approved	19/06/2018 17:05:52	
1323	HR	HC, Mumbai	Full Day	15/06/2018 00:00:00	15/06/2018 00:00:00	1	N/A	N/A	Approved	10/06/2018 17:15:49	
4525	HR	HC, Mumbai	Full Day	22/06/2018 00:00:00	22/06/2018 00:00:00	1	N/A	N/A	Approved	19/06/2018 17:44:25	
1323	HR	HC, Mumbai	Full Day	15/06/2018 00:00:00	15/06/2018 00:00:00	1	N/A	N/A	Approved	10/06/2018 17:05:50	
4525	HR	HC, Mumbai	Full Day	22/06/2018 00:00:00	27/06/2018 00:00:00	4	N/A	N/A	Approved	19/06/2018 17:05:52	
1323	HR	HC, Mumbai	Full Day	29/06/2018 00:00:00	29/06/2018 00:00:00	1	N/A	N/A	Approved	10/06/2018 18:07:12	
4131	HR	HC, Mumbai	Full Day	11/07/2018 00:00:00	11/07/2018 00:00:00	1	Marsh Transfer	N/A	Approved	04/07/2018 12:48:30	

Employee- Track My Leave (Details)


HR Home Page

Name: Manoh Tewari Employee Code: 4525 Company Name: PZ


Apply Leave Form 16 Download
 Apply leave on behalf of employee Mediclaim Details



Recruitment



Attendance Tracker



Leave Management

HR Home Page

Findings & Observations

The following findings were observed over the course of project development:

- The organizations lacks a dedicated I.T team to handle its I.T requirements. Also the I.T infrastructure of the organization needs to be updated.
- Prior to the portal development and implementations, the leave management process followed by the organization was manual with data being stored in Microsoft Word and Excel files which, thereby led to inconsistency of data
- Frequent changes to the software requirement specification resulted in a delay in the designing of the portal
- Portal customization in terms of space utilization, themes, user experience etc. is still pending as a basic portal was designed for the purpose of automating the leave management process
- The portal is yet to be integrated with the organizations existing bio-metric system.

Suggestions

The following suggestions can be implemented to ensure smooth and efficient implementation of the portal within the organization:

- The I.T infrastructure of the organization needs to be updated. A dedicated I.T team can be brought in place to handle the I.T systems implemented and to train employees on the same.
- A detailed S.O.P can help better in case of future software development.
- Implementation of the new portal would reduce inconsistency of data and allow one click access to data.
- Space utilization can be done by adding latest news or adding events about the employees such as an employee's birthday etc. Themes can also be added to make the portal more dynamic.
- Automated reports should be generated easily

from the portal which can make the salary generation process easier at the end of the month.

- A section can be implemented wherein, the employee can be allowed to pull back/delete and update the leaves they've taken.
- Employees previously applied leaves can be displayed when the page loads.

Implementation

The following procedures were implemented within the system according to the organizations policies:

- An employee's leave application and leave decline process from the employees reporting manager's end.
- Every employee is provided with a quick view of all their previously applied leaves till date
- Every employee has access to a leave tracker system where features are provided to respective employees based on their designation.
- Leaves were categorized under the 'loss of pay' category in case an employee had used up all their accrued paid leaves
- Application for certain Leave categories were made available to employees based on the number of applications made by the employee in the particular category
- Whenever an employee logged into the system, his/her attendance for all the days prior to the date of log in were updated.

Limitations

- Due to the system being developed within the organization, there is a likelihood that the scope of the system would be subjected to change and frequent changes to the software requirement specification of the portal will result in a system development delay.
- Busy schedules of VP-HR affected the Approvals and Designing of the Portal.
- The portal design is only limited to accommodate laptops and desktops version,

the design of the web application is not responsive to other portable devices.

- The existing bio-metric system is required to be upgraded in order for it to be integrated with the proposed system.

Future Scope

- The number of the features in the portal can be expanded and increased depending on the new policies that are implemented in the organization.
- A recruitment module can be implemented in the system which will prove helpful to the HR department where they can document the whole document process from resume screening to closure.
- These records stored through the system can be utilized by the department for analysis purposes and can help them make more informed decisions.
- A module documenting the exit process can also be implemented which will prove helpful for the HR department and these records can be used for analysing the attrition and retention rates.
- The design of the website can be converted into a responsive design that can enable the portal to be viewed over mobile phones, tablets and iPads thus increasing the accessibility of the portal and enabling employees to apply leaves on the go, as per their convenience.
- A section can be implemented wherein managers/employees can appreciate their fellow employees or subordinates for a job well done, which can be made available to be viewed across all employees in the organization/department so that an employee's efforts are recognised in a timely and wholesome manner
- An option enabling an employee to pull back applied leaves can be provided to the employees in case the employee does not want to avail the said applied leaves.

- The Attendance Tracker filters which are under development can be implemented once ready

Conclusion

The ICS group consists of four companies namely: Bentel Associates, Pioneer Property Zone, ICS Realty and Ayana Hospitality. The organization follows a manual process of filling out forms in order to apply for leaves. Although the organization has an existing biometric system that keeps track of the employee's attendance, the biometric system is not configured to accommodate the company's leave and attendance policies. ICS group has only one HR dept. which is shared across all four companies. Hence the HR dept. has to manually sift through piles of leave application forms and then make the necessary changes in the attendance report obtained through the biometric. This whole process takes place at the end of each attendance cycle (21st-20th) off each month. This process is hence very tedious and time consuming.

The project 'Designing & Development of a Web Portal for HR Dept. at ICS Group' is inclined towards automating the organizations leave and attendance management system. This system helps reduce the time and effort taken to manage the afore-mentioned system.

The interface provided through the portal would be simple and easy to use and it's major plus point is that, the system will be configured to accommodate the organisations current leave management policies.

Through the portal the employee's attendance status would be cross verified with the leaves taken by the said employee and updated accordingly. The employees would be provided with a quick view of the different types of leaves taken by themselves. Managers get to keep track of the employees working under them at a click

of a button. Information of employee's leaves and attendance details across all the four companies would be available to the HR dept. at a moment's notice.

However, the portal can be improved in terms of design and responsiveness to varied screen sizes. A number of other features can be added to the portal as well such as: an option to pull back applied leaves, recruitment process, exit interview process etc. An employee appreciation section can also be implemented through the portal. The records documented through this process can be used for future analysis purpose as well.

Although this web portal will automate the leave management process to a large extent, ICS needs to upgrade their I.T. software and hardware in the near future so that enhanced features can be incorporated in the portal.

References

- The organizations leave and attendance policies were referred.

- Inputs were and referred during the development process
- <http://www.icsgroup.co.in/>
- <http://www.bentel.net/>
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- <https://www.nuget.org/packages/TimePeriodLibrary.NET/>
- <http://www.pdfsharp.net>
- <http://www.ajaxtoolkit.net>
- <https://www.devexpress.com/Products/AJAX-Control-Toolkit/>
- <https://stackoverflow.com/>
- <https://www.c-sharpcorner.com/>
- <https://msdn.microsoft.com/>
- https://www.w3schools.com/cssref/pr_pos_right.asp

Acknowledgement

I would like to thank Ms. Chitra Kathuria, VP-HR & Ms. Manali Tawde (Industry Guide), Pioneer Property Zone, Prof. Vasudha Rao (Faculty Guide), Prof. Vaishali Kulkarni (Mentor) for their constant support and guidance

Optimization of Resources & Plant Automation at Linit Exports

- Mr. Suraj Pawar
(MMS II Operations)

Introduction:

Linit is an ISO 9001:2008 Certified 100% Export oriented manufacturing company offering wide range of "Stainless Steel Fasteners" and "Ready-to-Assemble Components" for Pump & Valve and General Engineering Industry, machined from Castings, Forgings and Barstock.

Linit has "State-of-the-Art" machining facilities at Vasai, near Mumbai & Rajkot with 90 CNC - VMC's & ultra-modern inspection & testing facility and Investment Casting Foundry at Sholapur.

Linit has maintained steady growth for last 8 years and Exports during 2017 has been USD 10.98 Million of which 51.37% is to Germany. Linit is always inspired with the "Transparency & Professionalism" of Germans and "Creativity & Craftsmanship" of Italians.

Need for Study

In packaging department of Sativali plant, three persons were employed at one workstation to do inspection, weighing and packaging of components respectively. While the first person does inspection, second and third person would be sitting idle. Further when first and second person were doing work in sync, the third person would sit idle till then. Moreover, workers were unskilled and remained absent often. All this resulted in wastage of manpower thus decreasing productivity.

Many of the European clients complained about the unwanted packaging material which comes

with fasteners as that adds to handling cost and takes efforts along with time to scrap the pallets which is of no use abroad

It is the additional burden to them as they don't need pallets or anything other than finished goods, which takes their storage space and money to de-scrap them with some third party help which is non-value-added activity both for supplier and at delivery end.

Excessive use of brown tape over packaging boxes resulted in discomfort to workers and wastage of resources. No daily planning of work was done by department head. Finished goods were lying all over floor resulting in unnecessary movement hurdle. The flow of material after machining to various departments and later to packaging department, via improper sequence of material movement which leads to delay in packaging and finished goods remains unpacked for long time. The company has a large amount of raw material (Approx. 200 tons), lying unused in the storage department. To meet increased demand for finished goods, there was need to increase raw material storage with space constraints in current layout. Extra gate i.e. unwanted material on casted component, needs to be removed before machining and currently the company has no machine to do so, thus company sends all its components to vendor for fettling process.

The study intends to explore the areas of automation in Sativali and KT sapphire plants of Linit Exports. It also intends to optimize resources

for the packaging department. This study also focusses on Inventory Management & Automation of Fettleing Process.

Objectives

- To optimize resources in the Packaging Department
- To enhance the plant layout for efficient and easy flow of finished goods.
- To automate fettleing processes and propose effective inventory management.

Data Analysis

Packaging Department at Sativali (Plant A):

Sativali plant mainly deals with "Stainless Steel Fasteners" and "Ready-to-Assemble Components" for Pump & Valve and General Engineering Industry, machined from Castings, Forgings and Barstock. All these components are outsourced from various vendors situated across northern Mumbai area. First of all these components are checked for quality by a team of dedicated skilled quality inspectors by systematic sampling method.

Proposed Suggestion 1: At every workstation, out of total three persons; employ two persons for inspection and one person for weighing for some time, when the inspection process is in sync with weighing process then the other person from inspection team is asked to do packaging which is remaining. In this way the bottleneck observed was removed and efficient process flow was achieved.

Proposed Suggestion 2 -Whole packaging department can be automated based on "weight" and "per piece count" criteria using available automatic packaging machines. This will increase productivity along with increasing quality of packaging in less time.

Proposed Suggestion 3- Currently majority of the cost incurred while supplying goods is associated

with packaging material and transportation costs incurred due to its total weight. So any measure taken to decrease any of these would directly increase the profit margins of company.

Proposed Suggestion 4- As we are in the shipping business, we know the importance of proper packaging to ensure the safety of our products. However, many overlook the importance of selecting the right type of packaging tape.

Packaging department in KT Sapphire (Plant B): Workforce analysis was done in packaging department to determine whether the utilization is optimal or not. The actual number of workers were found to be in excess to actually required.

Suggestions:

- Daily planning sheet to be made by dept. head so that workers know what all they need to complete in a day. It will also avoid people ganging up over same task.
- People with adequate skills are distributed over 03 workstations such that each workstation has manpower to do any task efficiently.
- Workers were trained about standard practices that would make their work easy.
- Finished goods were stacked according to customer over a designated area after packaging.
- Work rotation should be initiated.

Proposed Suggestion 5- It is essential to own a well-developed plant layout for all the accessible resources in an optimum manner and obtain the utmost productivity out of the accessible capability of the company. New layout was planned which is able to allow the best flow of materials at the lesser price with minimum material handling and process the finished product from the machining space to the packaging space via different departments to induce the finished product.

As everything after machining is on same floor and in a systematic flow, excessive manpower can be utilized more efficiently in between these departments removing the bottlenecks occurring in packaging department due to waiting line of machined goods.

This way is more practical as sea shipment occurs only twice in a month and this will give more work rotation and manpower would be utilized efficiently. Washers wouldn't be shifted anywhere as washing is continuous process and needs people all the time.

If there is some urgent air shipment some of the workers can be assigned at the packaging jobs as per requirement and urgency of customers.

Inventory Management

It is observed that the company has a large amount of raw material (Approx. 200 tons), lying unused in the storage department. The raw material consists of various metal rods of different diameters and grades. To meet increased demand for finished goods, there was need to increase raw material storage but due to space constraints in current layout and to make proposed layout functional i.e. reduce material movement by optimizing flow in between different departments, there was need to do inventory shifting to other area. Following problems were seen in current storage systems-

- Space issues as storage rack dimensional width is more.
- Mobility issues as structures are quite rigid & bulky.
- Raw material needs to be kept and drawn manually from end points, so no scope for automation.
- Wastage of manpower and time in handling of raw materials.
- The storage of raw material was haphazard.

Proposed Solution: The goal with inventory

management is to have the right amount of material in the right place and it should also be available at the right time. A raw material inventory that is managed properly is often the solution for reducing unsynchronized production flow and long waiting line.

- Use cantilever racks for minimizing space occupancy by storage racks.
- Mobile as light weight structures (mantling & dismantling).
- Ideal for long rods and bars.

Fettling Automation

LINIT EXPORTS PVT LTD has its own casting foundry at Sholapur which makes casting as per customer requirement which is machined further at Vasai plant. The problem arises due to side way gating system which is used to make investment casting of 304 & 316 ss grade, which is very strong. This extra gate needs to be removed before machining and currently the company has no machine to do so, thus company sends all its components to vendor for fettling process i.e. removal of unwanted material from casted component.

Proposed Solution: As we all know that to survive any market, superior quality along with timely supply of finished goods is must for which Linit has its own in-house supply with foundry at Sholapur, which fulfils the demand of good quality raw material for further machining. Due to side gating system there is additional material accumulation on the casting which needs to be removed before machining with the help of fettling tools like cutters, grinding blades and milling tool.

Currently the fettling operation is done through 3rd party vendors which takes time and adds to additional costs on manufacturing. So, there was need to find an optimal solution which can be installed in Vasai or Sholapur plant through which all fettling process takes place in-house itself.

Observations

- Bottleneck is observed during packaging process on workstation in Sativali plant.
- Outdated practices are being followed in Sativali Plant.
- Excess manpower is utilized for packaging in Sativali and KT Sapphire plant.
- Excessive material movement is present across departments.
- Raw material takes much of the floor space.
- Fettling operation is outsourced which is tedious and time consuming.

Limitations

- The research done was in accordance with the 02-month time frame assigned.
- Only the geographical accessible manufacturers were considered while suggesting the automated machines.
- The electricity and maintenance cost cannot be calculated as the machine is not setup before report is made.
- The actual working of the machine cannot be observed.

Recommendations

Sativali (Plant A)

- Workers should be trained properly for all kinds of tasks based on the skill matrix provided.
- Usage of slip sheets in place of wooden pallets.
- Installing automated packaging machine.

kT Sapphire (Plant B)

- Utilizing excess workforce over other tasks.
- Implementing new layout design for easy and efficient material flow.
- New cantilever storage racks for inventory management.
- Automation for in-house fettling process.

Conclusion

In packaging department, skill matrix should be

considered to train unskilled workers for required tasks as per requirement to improve overall productivity of department. The implemented automation for packaging should be used along with new suggested packaging practices for efficiency. Slip sheets should be used for customer satisfaction and cost savings for company. Improved plan layout was implemented to reduce material flow between various departments.

Cantilever storage racks should be used to utilize more of vertical space for better inventory management to cater the increasing quantity of raw material which is lying on floor. This will also help in better and easier material handling via centralized pulley system.

Automated machine for fettling process should be implemented as soon as possible to save the time wasted on outsourcing this process of removal of gates from casted components to third party vendors.

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Acknowledgement

I heartily thank my internal project guide, Prof. Vasudha Rao, for her guidance and suggestions.

SUMMER XCELLENCE 2018



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E-Mail: For MMS : info@sfimar.org For PGDM : pgdm@sfimar.org, For MFM/MMM : sfimarpt@sfimar.org