International Journal Of Engineering Research & Management Technology ISSN: 2348-4039

Email: editor@ijermt.org May- 2014 Volume 1, Issue 3 Website: ijermt.org

Investigation of processing factors driving the performance of manufacturing units (SME's)

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Abstract:

The small and the medium enterprises (SME's) sector play a pivotal role in the overall economy of the country, besides contributing significantly towards the employment generation and exports. To compete in the global market, implementing cutting edges and state of the art technologies are essential. SME's located in tier 1 cities have better access to such technologies when compared to SME's of tier 2 cities like Hubli-Dharwar, Belgaum (Karnataka, India). This work is carried out to identify the factors influencing performance and to create the interest amongst the entrepreneurs. This study attempted to identify processing factors and their impact on performance of small and medium manufacturing enterprises (SMEs) in Hubli-Dharwar region.

A well-structured questionnaire was used to capture the relevant data needed for analysis and identification of factors.Statistical package for the social sciences SPSS was used to analyse the dataset and test the various hypotheses. It is for the concerned stakeholders to focus on these factors on priority basis to enable SME's to reach their full potential.

Keywords: SME's, Adaptation, Pearson correlation, Descriptive analysis, multiple regression analysis.

1. Introduction.

SMEs are vital and of paramount importance in the development of any country especially for a developing country like India.Small and Medium Enterprises (SMEs) play a pivotal role and can be considered as the back bone of national economy (Peters and Waterman, 1982; Amini, 2004;Radam et al., 2008). Research studies have also shown that firms that have been able to effectively utilize the latest technology and possess good Human resource can achieve competitive advantages, Along with this SME's which have managed their financial aspects and maintained good organizational behavior management can be successful and also can with stand the environmental changes more effectively.

2. Literature review.

(A) Technical and Production Management.

Apulu and Latham (2011) found that the competitiveness of SMEs will be increased through adopting thelatest Technology and better production management practices.Subrahmanya, Mathirajan, and Krishnaswamy (2010) summed up that those SMEs which have technological innovation have a higher growth compared to the SMEs which are not creative in the sales turnover, investment and job.

(B). Human Resource Management.

Adnan, Abdullah and Ahmad (2011) indicated that HRM practices did have some effects on firm bottom line performance. Islam and Siengthai (2010) found that most of the core processes of HRM, namely, recruitment and selection, performance appraisal, training and development, as well as compensations have a momentous and positive impact on firm performance.

(C) Financial Management.

A business plan becomes critical for securing financial support. (Guffey, 2008), Barth, (2004) inferred that Failure of a firm is because of financial issues like cash flow management for external factor and lack of accessibility to finance. Pardhasaradhi (2009) presents the Staying-power deficiency defective financial structure influences the performance of firms. Trade credit is a very important source of financing for Indian SMEs, as confirmed by all existing studies/reports on the subject. Franklin Allen, Sankar De and others (2010).

(D) Organisation Behaviour & Management.

According to Morrison (2006), factors within an organization influence management decisions and the features of a company can affect the growth of a firm. The issues frequently considered are employee motivation, staff turnover and provision of training, leadership styles, investment in R&D and its organizational culture. Holt et al (2007) and Barratt et al (2005) claim that firm growth is dependent on managerial knowledge. Managers in SMEs are generally less trained (Tannock et al., 2001), consequently, this cause poor production technology. SMEs spend less on formal training due to financial limitations and the fact that it can be difficult to take employees out of the production (Thassanabanjong et al., 2009; Tannock et al., 2001). SME's which have showed interest in above points have showed positive improvements.

Hypothesis.

H1= Technology and production management positively influences the organizational performance of SME's.

H2= Human resource management positively influences the organizational performance of SME's.

H3=Financial management positively influences the organizational performance of SME's.

H4=Organization behavior and management style has positive affect on the organizational performance of SME's.

H5=Finance performance will in turn influences the process activities of SME's.

H6=Product market performance will in turn influences the process activities of SME's.

Notations used.

TPM --Technology &Production Management.

HRM--Human Resource Management.

FM--Financial Management.

OBM--Organizational Behavior & Management.

FP--Financial Performance.

PMP—Product Market Performance.

3.Methodology.

Descriptive study was carried out to ascertain the implication of each independent processing factor towards the performance of SMEs in Hubli-Dharwad region. A total of 150 sets of questionnaires were personally given to the randomly selected SMEs (manufacturing) industry all over HUBLI-DHARWARD.

The questionnaire consisted of 94 questions. All of the questions will be in likert scale of 1 until 7with 1 as strongly disagree and 7as strongly agree.

According to the DIC report DharwadSMEinfo, there are 924 registered units up till (2010-11). Which are categorized into different business sectorsThis research narrowed down the focus on 322 Manufacturing industries (include Agro Based, Metal based (steel fab.)&Engineering units) which comprise of 35% of all business sectors. Among the 150 sets of questionnaires that were distributed randomly to the SMEs in the manufacturing industry, there was a successful return of 128 sets. Nevertheless, only 100 sets were usable due to 28 sets of incomplete questionnaires.

Proposed research model.

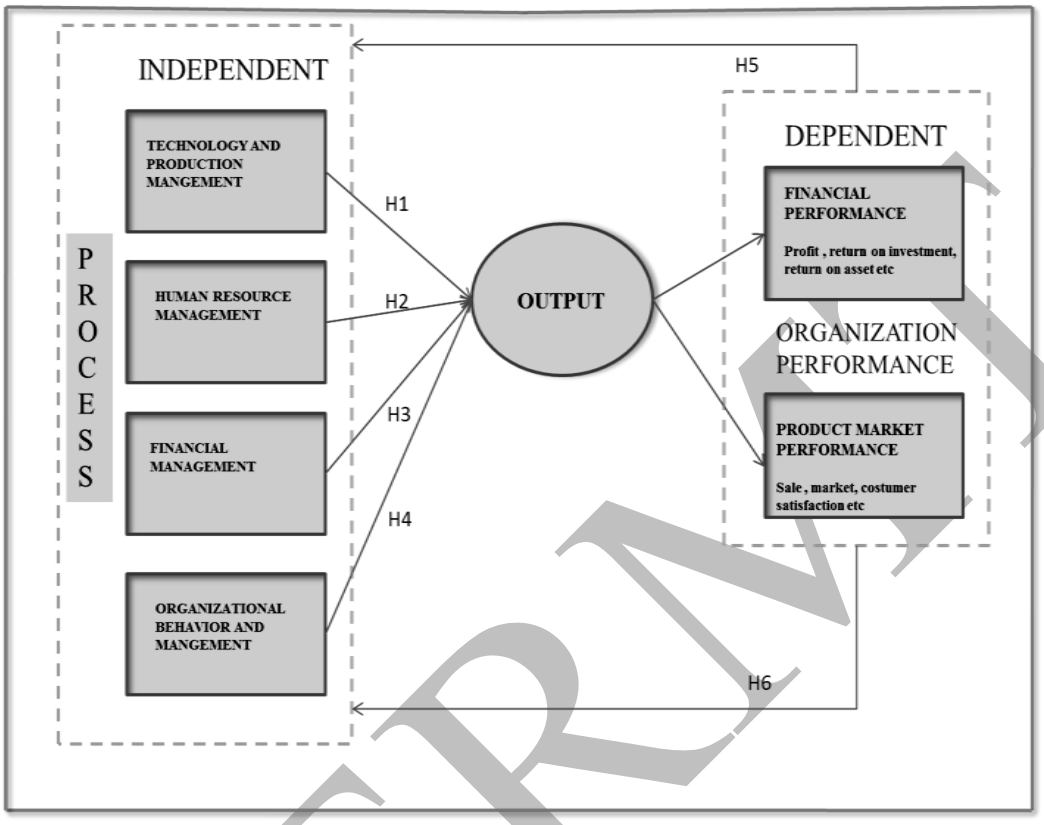

Figure 1: Research Model

Results and Discussions

1. Descriptive analysis **Table:1**

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TPM	100	4.63	7.00	6.1158	.54159	-.470	.241	-.196	.478
HRM	100	3.75	7.00	6.1265	.74798	-1.465	.241	2.360	.478
FM	100	4.50	7.00	6.2805	.51054	-.876	.241	1.095	.478
OBM	100	3.89	7.00	6.1583	.63164	-1.142	.241	1.764	.478
FP	100	4.00	7.00	6.2180	.67050	-1.445	.241	2.501	.478
PMP	100	4.10	7.00	6.2070	.58521	-1.113	.241	1.409	.478

Table 1 display the mean, standard deviation, maximum and minimum values of dependent and independent variables and also the values of skewness and kurtosis for all the independent and dependent variables of this research. Firstly, the results exhibit that the value of skewness for all the variables ranges from -1.465 to -0.470. In contrast, the kurtosis for all the variables is ranging from -0.196 to 2.501. Based on the result, it is clearly shown that all the independent variables and dependent variables are acceptable in terms of normality. This is because the value of skewness and kurtosis for all the variables conform to the rule of thumb where all the value is less than two and seven respectively (West, Finch & Curran, 1995).

2. RELIABILITY ANALYSIS

Cronbach's Alpha is the coefficient of reliability to check the internal consistency of variables. The scale was tested for reliability by using Cronbach's Alpha.

Table:2

Variables	**Construct**	**Cronbach's alpha**	**Number of items**
Independent variable 1	Technology and Production Management	0.772	16
Independent variable 2	Human Resource Management	0.884	20
Independent variable 3	Financial Management	0.842	20
Independent variable 4	Organisational Behaviour & Management	0.873	18
Overall value for independent variable		0.942	74
Dependent variable 1	Financial Performance	0.815	10
Dependent variable 2	Product market performance	0.816	10
Overall value for dependent variable		0.897	20

Armstrong and Foley (2003) suggested that "the closer Cronbach's alpha is to 1.00, then, the more reliable the scale". Nunnally et al., (1994) also stated that a value for Cronbach's alpha coefficient greater than 0.60 is considered acceptable. This rule of thumb is further supported by Ferketich (1991) who recommended that corrected item-total correlations should range between 0.30 and 0.70 for a good scale. In conclusion, all reliability coefficients as shown in Table2 have exceeded the minimum acceptable level of 0.60 as suggested by Nunnally et al., (1994) and Ferketich (1991). Therefore, this indicates that the items used in the construct are reliable and consistent.

3. Demographic profile of respondents.

Table:3

Category	Number	Percentage
Gender		
Male	92	92%
Female	8	8%
Age		
25-35 years	27	27%
36-45 years	35	35%
46-55 years	31	31%
56-65 years	7	7%
Above 65 years	0	0%
Education		
Diploma, NTTF and Others	48	48%
Under graduate	40	40%
Post graduate	12	12%
Doctorate	0	0%
Designation		
Junior supervisor(worker)	5	5%
Supervisor	11	11%
Manager	33	33%
GM/MD/Owner	51	51%
Type of organisation		
Small	53	53%
Medium	47	47%
No of employees in industry		
1-50	65	65%
51-100	32	32%
101-201	3	3%
201-500	0	0%
501-1000	0	0%
Above 1000	0	0%
Annual turnover of the organization (in INR)		
10-50 Lakhs	10	10%
50 lakhs -1 crore	37	37%
1-5 crore	30	30%
5-20 crore	17	17%
20-50 crore	4	4%
Above 50 crore	2	2%
Total respondents	100	100

As can be seen in Table 3 most respondents (92%) are male. Majority of the respondents that is (35%) are in the age bracket of 36 to 45 years and another (31%)are in the age bracket of 46 to 55 years. As regards their education, the vast majority of the respondents (48%) are Diploma, NTTF, GTTC holdersfollowed by (40%) degree holders. Most of the respondents (51%)are holding General manager , Managing director and Owner positions in the current organization.Nearly (53%) organizations visited have scaled them self as a small organizations. (65%) of the organizations have their employee strength between the range of 1-50. An annual turnover of (37%) ofthe organizations range between 50lakhes to 1 crore.

4. KARL PEARSON'S CORRELATION ANALYSES.

Correlation provides answer to three basic questions about two variables or two sets of data in a search. First it tells whether there is any relationship between two variables and if so, what are the direction of relationship and subsequently, the magnitude of the relationship.

Table: 4

		TPM	HRM	FM	OBM	OP
PEARSON CORRELATION	TPM	1.000				
	HRM	.582	1.000			
	FM	.562	0.722	1.000		
	OBM	.422	0.473	0.357	1.000	
	OP	.534	0.781	0.610	0.487	1.000
SIG.(2-tailed)	TPM	0.000				
	HRM	0.000	0.000			
	FM	0.000	0.000	0.000		
	OBM	0.000	0.000	0.000	0.000	
	OP	0.000	0.000	0.000	0.000	0.000
Numbers	TPM	100	100	100	100	100
	HRM	100	100	100	100	100
	FM	100	100	100	100	100
	OBM	100	100	100	100	100
	OP	100	100	100	100	100

Correlation is significant at the 0.01 level (2-tailed)

According to Hair, Black, Anderson and Tatham (2006), the correlation coefficient between each pair of independent variables in the Karl Pearson's correlation should not exceed 0.90. This is because the data may be suspected to have serious collinearity problem if the correlation value exceeds 0.90 (Hair et al., 2006). In Table 4, the highest correlation coefficient is 0.781 which is between the Organizational Performance and Human Resource Management and is still less than 0.90. Hence, it is assumed that there is no multicollinearity.

5. MULTIPLE LINEAR REGRESSION ANALYSIS

The Multiple Linear Regression Analysis for (organizational performance)reported that the coefficient of determination R square = 0.635 which indicates that 63.5 % of the variation in the dependent variable can be explained by all the independent variables in this research.

Based on the summary of analysis of variance (ANOVA), it is found that F statistic is at 41.278. This shows that there is a statically significant relationship between the set of six variables. The findings also show that all the independent variables are significant related to the dependent variable and the two independent variables meet the rule of thumb where the p-value is less than 0.10. The independent variable Human Resource Managementhas the most influence on the organizational performance at the coefficients of correlation (beta) of 0.496. In a nutshell, this model can significantly represent the relationship of independent variables with the dependent variable that is organizational performance.

Table: 5

Model		Unstandardized coefficients		Standardized coefficients	t	Sig
		B	Std. Error	Beta(β)		
1	(Constant)	1.556	.456		3.409	.001
	TPM	.080	.085	.075	.937	.351
	HRM	.496	.078	.623	6.367	**.000**
	FM	.057	.076	.070	.754	.453
	OBM	.123	.065	.135	1.879	**.063**

a. Dependent Variable: OP

Table 5 shows that the independent variables Human resource management and organizational behaviour and management are significant related to the dependent variable as this two independent variables met the rule of thumb where the p-value is less than 0.10. Then, an unstandardized coefficient linear equation is formulated:

EQUATION

OP=1.556+0.496HRM+0.123OBM

Where, R^2 = 0.635

N = 100

OP = Organizational Performance

HRM = Human Resource Management

OBM = Organisational Behaviour and Management

By evaluating the unstandardized coefficients linear equation formed above, it is found that each independent variable has varied relative importance of with the dependent variable.

The independent variable human resource management has the most influence with the coefficients of correlation (beta) of 0.496. Next, it is followed by the independent variable organisational behaviour and management with beta of 0.123, the other two independent variables are eliminated because the does not satisfy the thumb rule p<0.10. In short, the value of coefficients of correlation shows that the organizational performance can be improved by focusing on these two important factors.

Results for hypothesis testing

Table: 6

SL.No	Hypothesis	Link in model	p-value	Remarks
1	H1	TPM → OP	0.351	Not Supported
2	H2	HRM → OP	**0.000***	Supported
3	H3	FM → OP	0.453	Not Supported
4	H4	OBM → OP	**0.063***	Supported

P*< 0.10 Significant

The Multiple Linear Regression Analysis for dependent variable (processing factors) reported that the coefficient of determination R square = 0.334 which indicates that 33.4 % of the variation in the independent variable can be explained by all the dependent variables in this research.

Based on the summary of analysis of variance (ANOVA), it is found that F statistic is at 24.296. This shows that there is a statically significant relationship between the set of six variables. The findings also

show that all the dependent variables are significant related to the independent variable and the dependent variables meet the rule of thumb where the p-value is less than 0.10. The dependent variable financial performance has the most influence on the processing factors at the coefficients of correlation (beta) of 0.336. In a nutshell, this model can significantly represent the relationship of dependent variables with the independent variable.

Table: 7

Model		Unstandardized coefficients		Standardized coefficients	t	Sig
		B	Std. Error	Beta(β)		
1	(Constant)	5.040	.196		25.767	.000
	FP	.336	.071	.898	4.710	.000
	PMP	-.147	.073	-.383	-2.009	.047

a. Dependent Variable: TPM, HRM, FM,OBM (AVG).

Table7 shows that the dependent variables financial performance and product market performance are significant related to the dependent variable as these two independent variables met the rule of thumb where the p-value is less than 0.10. Then, an unstandardized coefficient linear equation is formulated:

EQUATION

AVG=5.040+0.336FP-0.147PMP

Where, $R^2 = 0.334$

N = 100

Average = Includes all processing factors(TPM,HRM,FM,OBM (AVG)).

FP = Financial performance

PMP = Product Market Performance

By evaluating the unstandardized coefficients linear equation formed above, it is found that each dependent variable has varied relative importance of with the independent variable.

The dependent variable Financial Performance has the most influence with the coefficients of correlation (beta) of 0.336. Next, it is followed by the dependent variable product market performancewith beta of -0.147, both the independent variables satisfy the thumb rule p<0.10.This result, regression analysis shows that both independent and dependent variables are interrelated to each other.

Results for hypothesis testing

Table: 8

SL.No	Hypothesis	Link in model	p-value	Remarks
1	H5	FP → Processing factors	.000	Not Supported
2	H6	PMP → Processing factors	.047	Supported

P*< 0.10 Significant

Obtained Research model

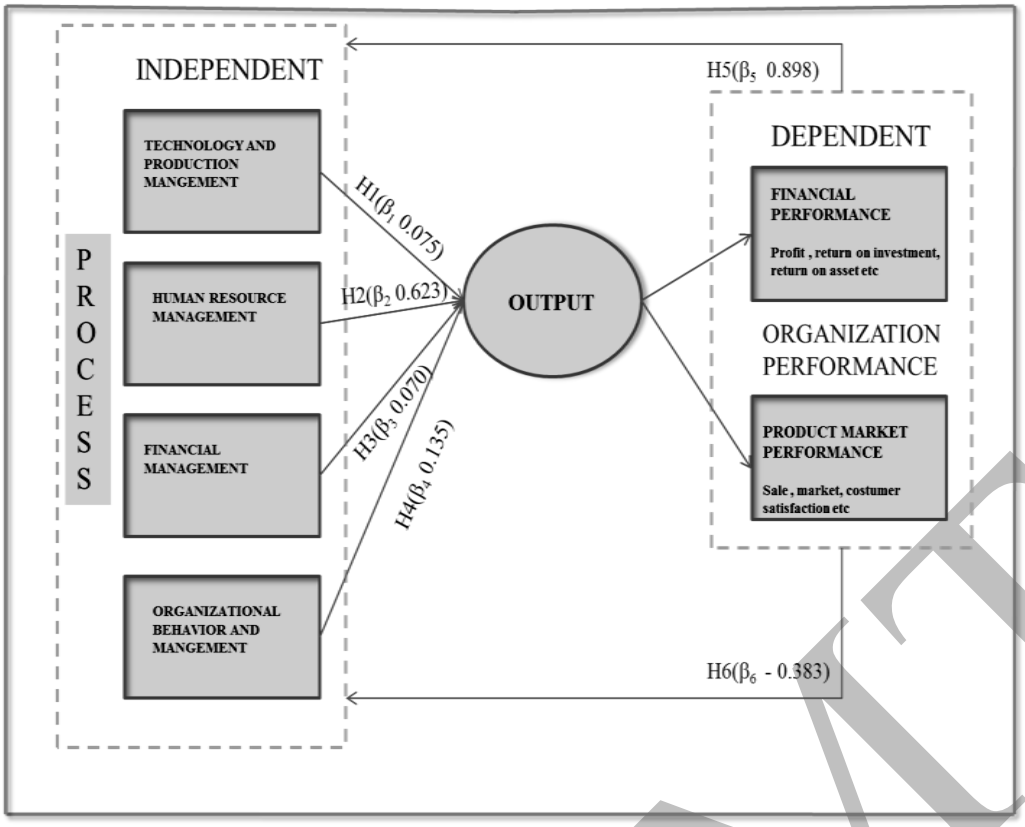

Figure 2: Obtained Research Model

7.Conclusions and Discussions

From the analysis of the data we came to know that two factors human resource management and organizational behaviour management are most significant processing factors which drive the performance of the SME's. The other two factors technology and production management and financial management are also important for the growth of SME'S but at present the results throw light on this two factors as far as processing factors concerned in manufacturing SME's in this particular region(Hubli-Dharwad).

The result shows that there is a significant positive relationship between appropriate HRM with organizationalperformance of SMEs. This is consistent with the findings of past researches in the context of appropriate HRM affect the performance of SMEs such as Adnan et al., (2011) and Islamet al., (2010). This is supported by a number of researches where they argue that HRM practices and performance research have common attributes as well as contradictions (Boselie, Dietz, &Budhwar, 2005; Wall & Wood, 2005; Katou&Budhwar, 2006).

The result showed that there is a significant positive relationship between appropriate OBM with organizational performance of SMEs.According to Morrison (2006), factors within an organization influence management decisions and the features of a company can affect the growth of a firm. The issuesthat are frequently considered are employee motivation, staff turnover and provision of training, leadership styles, investment in R&D and its organizational culture. Holt et al (2007) and Barratt et al (2005) claim that firm growth is dependent on managerial knowledge.

Future scope

By increasing the sample size we can go for exploratory factor analysis and cluster analysis followed by structure equation and system dynamics modelling to check causality amongst the variables.

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