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Impacts of Globalization on Industrial Productivity: A Survey Conducted in Industries at Vitthal Udyognagar of Anand District of Gujarat, India

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Abstract In the globalization era each and every organization which wants to compete the world's changing scenario has to adopt changes with time. In case of globalization, privatization and liberalization old traditional strategies of manufacturing and management have already changed. There are no cross border bearers and giants which can operate their operations from more than one country availing the advantages of availability of resources, man power, and know-how at cheaper rates to boost their own performance and hence the productivity. The ultimate aim is to uphold the turnover of the organization and to create good market penetration of the goods produced in highly competitive business world. The case presented here was considered in an industrial estate where majority units are working in small scales. The attempt was made to know the perceptions from the custodians or their representatives about the globalization and its impacts on industrial productivity.

Keywords Globalization, Scenario, Strategies, Operations, Industrial Productivity.

1 Introduction

Global competition is experiencing a rapid growth in emerging world markets like China and Eastern Europe, and this means that even medium-sized companies must extend their operations globally. Making a product only in the United States and then exporting it no longer guarantees success or even survival. There are new standards of global competitiveness that include quality, variety, customization, convenience, timeliness, and cost [1]. This globalization of production contributes to efficiency and adds value to the products and services offered to the world, but it also complicates the operations or the manager's job. To help understand international business activity, experts have categorized firms according to the extent of their global activities. A firm that integrates operations from different countries and views the world as a single marketplace, with standardized goods and services to meet the needs of customers worldwide, may be able to capture a competitive advantage, such as lower costs through economies of scale, by concentrating production in a handful of highly efficient factories. More and more firms are clearly dispersing parts of their production processes to locations around the world to take advantage of national differences in the cost and quality of labor, talent, energy, facilities, and capital. Thus, it is not always meaningful to talk about

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"Japanese products", "British products", or "American products."There are many reasons why a domestic business operation will decide to change to some form of international operation. These can be viewed as a continuum ranging from tangible reasons to intangible reasons, such as: reducing costs (labor, taxes, tariffs, ect.), reducing risks (foreign exchange, ect.), improving supply chains, providing better goods and services, attracting new markets, learning to improve operation and attracting and retaining global talents [1].

This study is carried out in Vitthal Udyogar in Anand district of Gujarat state, where about 1000 industrial units are working. The estate came into existence some time in 1965, slowly but steadily progressing upward. The district has six industrial estates; out of these Vitthal Udyognagar GIDC is in lead position among all. The varieties of units and their products need sound strategic planning and marketing, and for that this study is aimed to assess the situation by knowing the perceptions of the respondents about impacts of globalizations and competitiveness on industrial productivity of the organization. The majority units are in a small scale.

2 Objective of the study

The main aim of the study is to identify the impacts of globalization and competitiveness on industrial productivity of the estate under study.

3 Research instrument

A questionnaire was developed on the basis of the present infrastructure scenario of the estate under study. The questionnaire consisted of 16 closed ended questions which were framed keeping in mind the various aspects; those are influencing industrial productivity that the respondents may wish to see in the organization. A five-point Likert scale ranging from strongly dissatisfied (1) to very satisfied (5) was used to assess the situation to each of the identified attributes.

3.1 Data collection

The data were collected within the Vitthal Udyognagar, GIDC in Anand district of Gujarat state. The survey was conducted across the cross section of the estate including various industries and employees from top, middle, and bottom levels of the organizations.

3.2 Sample size

An accidental sampling method was chosen to serve the purpose of data collection. This method seemed acceptable and appropriate taken into account the exploratory nature of the study. Over 250 questionnaires were distributed among the employees of the organizations. Of the 250 questionnaires distributed, 94 were excluded for the reasons of incompleteness of answers and inconsistencies in responses and non-return of questionnaires, thus, 156 usable questionnaires constitutes the sample size.

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4 Statistical analyses and findings

The 156 usable questionnaires were analyzed using the SPSS software. Frequencies were used to generate a profile of the key demographic characteristics of the respondents. Descriptive statistics were utilized to calculate the mean and standard error scores. An exploratory factor analysis was used to uncover the underlying factors related to the impacts of globalization and competitiveness on industrial productivity.

4.1 Demographics characteristics

The respondents: The number of male respondents in the survey were 150 (96.20%) and 6(3.80%) were female respondents. Most of the respondents who participated in the survey were graduates and had educational qualification above it. 5.10 percent of the respondents were Ph.D., 22.40 percent of the respondents were post-graduates, 66 percent of respondents were graduates, and the remaining 6.40 percent were undergraduates.
Respondents' work experience: The highest work experience; 39.70% between were 10-20 years, 23.70% between 21-30 years, 23.10% less than 10 years, 12.20% of respondents were above 30 years of experience, and only 1.30% respondents were with more than 40 years of experience.
Category of the company: As mentioned earlier the majority of units were in small scale. The same thing is reflected over here. In this survey 70.51% (110) were in small scale, 19.23% (30) were in medium scale, and only 10.26% (16) of large scale units have participated and provided relevant data for this research study.
Sector of the company: Out of 100% respondents (156 units sample size), 89.20% of units were in private sector, 5.10% in public sector, and only 0.60% in government units, while 5.10% were other categories who have participated and supplied data for the analysis.
Classification of the industry: Estate under study was dominated by 68.30% (105) engineering units, the other classified units were very few in the dedicated sample: 3.80% electrical/electronics, 5.80% paints, varnishes and 3.20% were chemicals industries. Remaining miscellaneous units amount 19.90% of the total, have participated in this research study and supplied the relevant data for this study.
ISO Certificate: The 25% of respondent industries had ISO Certificates, 75.00% of industries were without ISO Certificates.
Man Power: Out of 156 representative industries and total employees 12092, 97.59% of male employees and only 2.41% of female employees in the industries of the sample were considered.
Markets: Markets' scenario shows demands: Indigenous (19.90%), state level (29.50%), national level (23.70%) and international level (26.09%) were recorded of the representative organization of the sample considered. State level demand observed slightly compared to national and international demands.
Technical collaboration: 82.70% of industries did not have any technical collaboration with any third party either nationally or internationally, only 17.30 % of industries had technical collaboration and have responded to the questionnaire for this research study.

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4.2 Factor analysis

Factor Analysis is a general name denoting a class of procedures primarily used for data reduction and summarization. In research survey, there may be a large number of variables, most of which are correlated and which must be reduced to a manageable level. A factor is an underlying dimension that explains the correlations among a set of variables [2].

Appropriateness of factor analysis: The first step, prior to running the factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity were conducted (Table 1). The value of the KMO value 0.791, which is sufficiently large (>0.5), and supporting the appropriateness of using factor analysis to explore the underlying attributes. The Bartlett's test of sphericity was highly significant ($p<0.000$) significance value of Bartlett's Test is 0.000, rejecting the null hypothesis that the 16 important attributes are uncorrelated in the population. Factor analysis is carried out using the principal component method with varimax rotation, the attributes with factor loading 0.6 or greater were considered significant in this analysis.

Table 1 KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.791
Bartlett's Test of Sphericity	Approx. Chi-Square	1731.841
	Degree of freedom	120
	Significance	0.000

Communalities: The communalities are presented in Table 2. The percentage of total variance explained by the common factors referred to as communality. Communalities represent the proportion of the variance in the original variables that is accounted for by the factor solution. The factor solution should explain at least half of each original variable's variance, so the communality value for each variable should be 0.60 or higher. This term may be interpreted as a measure of "uniqueness." A low communality figure indicates that the variable is statistically independent and cannot be combined with other variables [2].

Table 2 Communalities

Variables	Statements	Initial	Communality
V1	Globalization has changed industrial scenario	1.00	0.772
V2	Globalization has improved job opportunities, productivity and living standards	1.00	0.820
V3	Liberalization has improved industrial performance and competitiveness	1.00	0.726
V4	Privatization has improved industrial performance	1.00	0.619
V5	ISO certification improves the image of the company	1.00	0.777
V6	ISO certification increases expectations of the company	1.00	0.900
V7	ISO certification increases productivity.	1.00	0.885
V8	Downsizing is very essential in highly advanced technological scenario	1.00	0.813
V9	Voluntary Retirement Scheme (VRS) improves industrial productivity	1.00	0.807
V10	T.& D. Programme arranged in organization helps employee	1.00	0.671

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	productivity		
V11	T. & D. helps to improve industrial performance	1.00	0.897
V12	T. & D. helps improve effectiveness of the organization	1.00	0.870
V13	T.& D. is essential for betterment of present and future job performance	1.00	0.867
V14	T&D improves, employees' and industrial productivity	1.00	0.896
V15	Job stresses negatively affect personal relationships with colleagues.	1.00	0.653
V16	Job stresses to employees' negatively affect industrial productivity.	1.00	0.633

Extraction Method: Principal Component Analysis.

Extracted factors: The five extracted factors that explain 78.795% of the total variance attributed to each factor presented in Table 3. For this, an analysis of the Eigen values is required. The Eigen value represents the total variance explained by each factor. Only those factors are extracted whose Eigen values are greater than one. The factors extracted here are five and together contribute 78.795 % of total variance. Thus, extracting five factors from a total of sixteen variables for measuring the impacts level is good. Also, 'Factor Analysis was tentatively considered appropriate for analyzing data. Screen plot also confirms the total number of factors (See Fig. 1).

Table 3 Extracted factors

Sr. No.	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.282	26.761	26.761	4.282	26.761	26.761	4.202	26.265	26.265
2	3.946	24.664	51.425	3.946	24.664	51.425	2.754	17.214	43.478
3	1.919	11.994	63.419	1.919	11.994	63.419	2.754	17.211	60.690
4	1.356	8.474	71.893	1.356	8.474	71.893	1.598	9.987	70.676
5	**1.104**	**6.902**	**78.795**	**1.104**	**6.902**	**78.795**	**1.299**	**8.118**	**78.795**
6	0.766	4.788	83.582						
7	0.572	3.574	87.157						
8	0.431	2.695	89.851						
9	0.389	2.430	92.281						
10	0.333	2.084	94.365						
11	0.254	1.585	95.950						
12	0.193	1.204	97.154						
13	0.145	0.909	98.063						
14	0.122	0.761	98.824						
15	0.110	0.688	99.512						
16	0.078	0.488	100.000						

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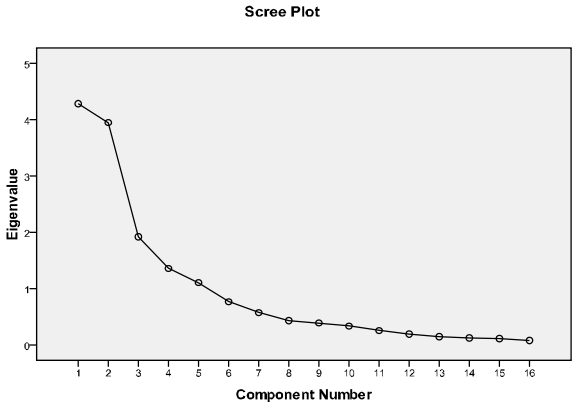

Fig. 1 Scree plot to identify the number of factors

Model fitness: The correlation matrix, Reproduced correlations and Residuals are known with the help of SPPS, and it is observed that there are 18 (15%) non-redundant residuals with absolute values greater than 0.05. The lower the percentage of 'the non-respondent residuals with absolute values greater than 0.05', the higher is the acceptability of the model fit. Here 15% is a low percentage, so the model is good, the data are explained well because the number of 'the non-redundant residuals with absolute values greater than 0.05 is less than 50 percent (Tables of 'correlation matrix', 'reproduced correlations' and 'residuals' are not shown).

Rotated Matrix: There are various methods of rotations. The method of rotation used is varimax, which is the most commonly used rotation method in factor analysis. The variance explained by each component after the varimax rotation method and the number of factors extracted based on Eigen value 1 and more, total variance explained is 78.795%., the variables associated with five factors are shown in Table 4. Factors extracted from factor analysis are:

Table 4 Rotated matrix

Variables	Statements	Factors				
		1	2	3	4	5
10	T.& D. Programme arranged in organization helps employee productivity	**0.813**				
11	T.&D. helps to improve industrial performance	**0.939**				
12	T. & D. helps improve effectiveness of the organization	**0.930**				
13	T.& D. is essential for betterment of present and future job performance	**0.927**				
14	T&D improves, employees' and industrial productivity	**0.945**				
1	Globalization has changed industrial scenario		**0.850**			
2	Globalization has improved job opportunities, productivity and living standards		**0.895**			
3	Liberalization has improved industrial performance and competitiveness		**0.829**			

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4	Privatization has improved industrial performance	**0.623**				
5	ISO certification improves the image of the company		**0.835**			
6	ISO certification increases expectations of the company		**0.945**			
7	ISO certification increases productivity.		**0.928**			
8	Downsizing is very essential in highly advanced technological scenario				**0.856**	
9	Voluntary Retirement Scheme (VRS) improves industrial productivity				**0.865**	
15	Job stresses negatively affect personal relationships with colleagues.					**0.807**
16	Job stresses to employees' negatively affect industrial productivity.					**0.788**
	Number of variables associated with factors	**5**	**4**	**3**	**2**	**2**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

5 Results

The extracted five factors are named and interpreted (see Table 5). Factors extracted from factor analysis are:

Table 5 Factors extracted from factor analysis

Factor	Factor description	Variables associated
1	T&D improves performance	T.& D. Programme arranged in organization helps employee productivity, T.&D. helps to improve industrial performance, T. & D. helps improve effectiveness of the organization, T.& D. is essential for betterment of present and future job performance, T&D improves, employees' and industrial productivity
2	Globalization improves living standards	Globalization has changed industrial scenario, Globalization has improved job opportunities, productivity and living standards, Liberalization has improved industrial performance and competitiveness, Privatization has improved industrial performance
3	ISO improves image of the company	ISO certification improves the image of the company, ISO certification increases expectations of the company, ISO certification increases productivity
4	VRS improves productivity	Downsizing is very essential in highly advanced technological scenario, Voluntary Retirement Scheme (VRS) improves industrial productivity
5	Job stresses negatively affect productivity	Job stresses negatively affect personal relationships with colleagues, Job stresses to affect negatively employees productivity

Factor 1: T&D improves performance
T.& D. Program arranged in organization helps to improve the employee productivity. Industrial performance, and effectiveness of the organization is essential for improvement of present and future job performance, and this improves the employees' and industrial productivity. The most significant factor that is determined in addition to the quality of

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products is productivity. Training and development helps the employees improve their capability of doing better work and also helps to improve individual performance and productivity.

Factor 2: Globalization to improve living standards

Globalization has changed industrial scenario, improved job opportunities, productivity and living standards. Liberalization has improved industrial performance and competitiveness, Privatization has improved industrial performance. In the era of globalization, liberalization and privatization have highly increased the competitiveness in the global markets. At the same time it has boosted industrial productivity and living standards of people.

Factor 3: ISO improves image of the company

ISO certification improves the image of the company, increases expectations of the company, and increases productivity. ISO company carry a special image of the company, and it has to meet set standards and has to follow the standardized procedures for products as well as services will certainly help improve acceptability of the outputs and increases productivity.

Factor 4: VRS improves productivity

Downsizing is very essential in highly advanced technological scenarios; Voluntary Retirement Scheme (VRS) improves industrial productivity. In the globalization and highly competitiveness one has to adopt the changes, and those failed to accept changes will fail miserably. The use of computers and CNC machines drastically reduces human efforts and requirements as well. So reducing the man power per the requirement by offering VRS will cut lot of overhead costs in addition to direct labor cost.

Factor 5: Job stresses negatively affect productivity

Job stresses negatively affect personal relationships with colleagues, and it also negatively affects the employees' productivity. The healthy working conditions, increases morale and motivation to work more efficiently and effectively to increase organization's overall performance and hence productivity.

6 Conclusions

The study mainly focused on finding out the impacts of globalization and competitiveness on productivity. It is interesting to know that almost everybody has the opinion that globalization has changed the present industrial scenario, and it is the demand of the day. The set attributes regarding globalization, liberalization and privatization, ISO, VRS, Job stresses all attributes have their own effect on the industrial performance. The five factors uncover the associations of the 16 attributes. These factors contribute the market penetration leading to higher productivity of the organization.

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