

Profile of the Machine Shop Industries in Pangasinan

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Abstract — This study made use of a descriptive - developmental method of research which sought to assess the status and management practices of the machine shops industries in Pangasinan. The study dealt specifically with the profile characteristics of the employer on their age, sex, civil status, highest educational attainment and years of working experience in the shop. Moreover, this study dealt on the profile characteristics of the Employee along their Age, Sex, Civil Status, Highest Educational Attainment, Status of Employment, and Years of Working Experience in the Shop and Training/Seminars Attended in the last three years. At the same time, the profile characteristics of the Machine Shop Industry in terms of the Management Organization, Number of Years in Business, Type of Registration, Level of Capitalization, Sources of Funding, Services Offered, Number of Employees/Workers and Wages/Salaries

This study also focused on the identification of the availability of the facilities needed in the operation of the machine shop industry. Furthermore, this study dealt with the management practices of the Machine shop Industry in Pangasinan along: Implementation of Safety Precautions, Rules, and Regulations, Benefits of Employees and Prospects for Development. The output of the study is the proposed development plan to enhance the management practices of the Machine Shop Industry in Pangasinan.

Keywords — *Management Practices, Implementation, Machine shop Industry, Mechanical Technology*

I. INTRODUCTION

The revolutionary progress of each nation today is brought by volatile economic climate coupled with fast-changing technological advancements. Thus, the businesses adopted various management styles and approaches, business acumen, and proven problem-solving techniques in addressing a challenge of a developed, sustainable, profitable and successful industry.

The business industry is made up of all types of companies. Among the fastest growing sectors are healthcare and medical, service, financial, metalworking, construction, and transportation. Apparently, within these firms perform different management practices for the top business administrators which they direct the organization's overall operations, devise strategies, execute policies, and oversee the employees and tasks within the purview and implement directives from the upper echelons.

Management Practices is the lifeblood of a successful business, and a flourishing nation for it serves as the vehicle for productive human resources.

These practices may differ in policies and implementation; indeed it is an indispensable element in the process of operation and supervision of business. The constant increase in the productivity of an industry depends upon the right choice of management practices. The critical analysis of the industry owners and managers of the business can definitely help them to choose the best strategy that can be helpful in increasing the productivity and efficiency of the industry and keep their customers happy and satisfied. Employees, partners, and customers should all be evaluated when the management finalizes the techniques that prove to be the best for the business. Some management techniques motivate some employees; others might need different forms of motivation. For instance, incentives and training programs might be helpful to motivate, educate and retain employees. Thus, management entails the acquisition of managerial competence, and effectiveness in the following key areas: problem-solving, administration, human resource management, and organizational leadership.

Locally, in the region, one of the most profitable businesses nowadays is metal working for it is needed in all areas of construction, transportation,

invention, and innovation. Metalworking has been practiced by the early Filipinos as it was known that the art of forging ironware for farm implements was considered a tradition dating from the 13th century and has been passed on from generation to generation. Around the early part of the 15th century, iron plows and bladed weapons were being produced. Cannons have been cast in the country long before Spaniards came to the Philippines.

The Philippine Metalworking Industry is considered as the backbone of the industry, a country's degree of real industrialization can be gleaned from the state of development of its metalworking sector. For a country to belong to an industrialized country, its metalworking sector must be reasonably capable of self-reliance in terms of manpower, equipment, and technology since it covers all activities and processes involved in the transformation of metals into useful products such as machines and parts thereof. The various metal workings are casting (foundry), machining and grinding, heat treating, press working, finishing, joining and assembly and other related processes. (16th MIAP National Convention 2007). In metalworking lies the machine shop industry in which the Machine Shop Services industry steadily for the past five years until 2015, posting revenue growth in the past five years. Much of this growth was driven by a robust rebound in the industry's major markets, including commercial aerospace and transportation manufacturing, which picked up in 2011. During the past five years to 2020, operators will devote further resources to satisfying growing demand from manufacturers in industries like automobile manufacturing, commercial aircraft manufacturing, and metal forging.

The mandate is to provide both government and private sectors in the metals and engineering industry with professional management and technical expertise on training of engineers and technicians, information exchange, trade accreditation services, quality control and testing of metal products, research and development, and business economics advisory services.

The vision is in aspiring for excellence in serving the metal and allied industries and shall strengthen its commitment to its thrusts and goals toward becoming world-class service organization through its dynamic leadership, highly motivated human resources, state-of-the-art equipment and facilities and internationally certified quality system.

Moreover, one of the strategies to attain the national goals of self-sufficiency and global competitiveness in upgrading research and development capability Metal Industry Research Development Council (MIRDC) initiates projects which are expected to find their niche as the export winner, respond to domestic needs, or provide support to other industries. (MIRDC journals/Pamphlets)

All areas within manufacturing industries are highly competitive today, which means that companies or industries constantly have to reduce their lead times. This entails improving machining methods constantly to keep a competitive edge. The productivity is an important factor in today's machining. Another way of looking at it is that of achieving sufficiently high output from one's equipment and available production hours. Today, a company cannot succeed without incorporating into its strategy the astonishing technologies that exist and should always continue to evolve. Technological advances create new products, advanced production techniques, and better ways of managing and communicating. Also, as technology evolves, new industries, markets, and competitive niches develop. Advances in technology also permit companies to enter markets that would otherwise be unavailable to them (Bateman, Snell 2007). Better means of metalworking are now invented and introduced in the country.

As the country braced with rapid economic development, more and better equipment, building establishments were invented and constructed/ repaired. This is because there more people to cater to and so with the demand for better services to the public. Despite of these, people demand for more and better services. People begin to compare the services renders by the previous industries, bureaus, and other offices.

From such conditions, this study evolves. It centers on the management practices of Machine shop Industries situated in Pangasinan. Significantly that management of a business or industry is a pertinent consideration leading towards economic growth and prosperity. Ranging from small industries to multilevel and transnational industries should furnish with effective management practices for its sustainability and viability. Furthermore, the objective of the study is to assess and find out the status of the industry, and how efficient, quality of the works renders to public service, the problem inherent in it, and the whole gamut of its operations.

The researcher is a Licensed Mechanical Engineer who is presently an Assistant Professor III of Mechanical Technology at Pangasinan State University, Asingan Campus. He is a graduate of Machine Shop Practice during his Secondary Education and Technical Machine Shop in his Vocational Education. He became a manager in the Pangasinan Technology Business Incubator (PTBI) in PSU Urdaneta Campus. The researcher is equipped enough with ample knowledge and experience that will qualify him in conducting the research work.

Theoretical Framework

The study also dwelt on the development of the metal industry as anchored to development in which Transformational Growth Theory is used as the bases of the study which according to the website (<http://www.vault.com/industries-professions/industries/business-administration-and-transformational-growth>) describes the changes in both institutions and the working of markets, as growth and innovation take place. General Theory of Transformational Growth, traces the pattern of capitalist development through a succession of stages, in each of which markets adjust differently, and in doing so, give rise to market pressures leading to innovations, which move the system to the next stage. In each stage, the working of markets will be governed in part by the structure of costs and the pattern of growth in demand, both of which depend on technology and innovation.

The fundamentals of metallurgy would undoubtedly be very helpful to every machinist and machine-tool operator. Such knowledge would give him at least a partial picture of what goes on within a piece of metal while it is being cut. This, in turn, would make it far easier for him to understand why cutting tools must be designed in a certain way, held at a specified angle, and applied at a given speed and feed for best results in cutting one type of metal. They must be designed, held, and applied quite differently for best results in cutting different types of metal.

The advancement of the science of metallurgy has made better metals available, as well as having added knowledge of how such metals available, as well as having added knowledge of how such metals may be more readily machined by the use of special alloys in machine-driven cutting tools.

The Science of Metallurgy will greatly relevant to the study for it seeks to understand its importance and pertinence in the growth of the economy.

Conceptual Framework

Modern metalworking processes, though diverse and specialized, can be categorized as forming, cutting or joining process. Today's machine shops includes a number of machine tools capable of creating a precise, useful workpiece (<https://en.wikipedia/wiki/metalworking>)

The increasing number of metal industries prompted the government to create a separate and distinct agency/center to deal with the research to develop and expand the metals industry of the Philippines. R. A. No 4724, established the Metal Industry Development Center (MIDC). The center was primarily tasked to work for close rapport between the government and the industry in order to foster the advancement of metals, engineering, and allied industries in the country. This was amended by R.A. 6428 reorganizing and renaming the MIDC into Metals Industry Research and Development Center (MIRDC), giving it a corporate existence and enlarging its powers. The MIRDC, an attached agency of the Department of Science and Technology (DOST) is the sole government entity directly supporting the metals and engineering industry with service designed to enhance its competitive advantage.

A Technical Education and Skills Development Authority (TESDA) report on Labor Market Intelligence dated March 5, 2012 on the economic inputs of metalworking in the Philippine industry, signifies the importance of metal industries to innovate their capabilities in order to build up the labor market of the Philippines, are the provisions of the report. The Metal Industry Act of the Philippines otherwise, known as the Act 4724 refers to the manufacture from ore materials of products of all precious, base and rare metals and their alloys, including all processes from smelting in direct or indirect reduction furnaces to the final finished product state. The final processing, manufacture, fabrication, and/or assembly into finished metal products and the like, and their metal parts and accessories; transport equipment, various metal manufactures, hand tools and implements, tools, dies and molds, household utensils, hardware and metals, metal containers and other miscellaneous manufactured articles of base, precious and rare metals and their alloys.

The study is under the turf of the law for it focuses on the development of the machine shops industry as a vehicle for economic progress. In the same manner, this study looks into the provisions of

the facility and equipment, human resources management.

The study was anchored upon the I-P-O model, which corresponds to the input, process, output scheme such that the input modified the proposed development plan to enhance management practices of the machine shop industry.

Figure 1 presents the paradigm of the study. The first box served as the input which contains the status of the machine shop industry and the management practices of the Machine shop operation that is established in Pangasinan. Such input considers both human and non-human resources necessary to keep the industry in operation. The human resources include the profile of the Employer and other employees maintain such as age, sex, civil status, highest educational attainment, years of experience and training attended.

It also presents the profile of the Employees their qualifications and training. The non-human resources include the capitalization invested by the Employer,

Equipment and other necessary structures are maintained to ensure better procedures and smooth operation.

The second box contains process on how the study was conducted using a descriptive analysis and the data collection method of research with the aid of a survey questionnaire. It focused on the analysis of the present situation and the collection of data from the respondents.

The last box contains the output; it consists of the involvement of the present status or the proposed development plan to enhance or improve the management practices of the said machine shop industries in Pangasinan. It considers whether the industry is staying competitive with other machine shops, the cooperation or non-cooperation of employer and employee between and among themselves.

Statement of the Problem

The study aims to assess the status and management practices of the machine shops industry in the selected cities and towns of Pangasinan.

Specifically, the study seeks to find answers to the following questions:

1. What is the status of the Machine Shop Industry in Pangasinan along

1.1. Profile Characteristics of the Employer

- a. Age
- b. Sex
- c. Civil Status
- d. Highest Educational Attainment
- e. Years of Working Experience in the

Shop?

1.2. Profile Characteristics of the Employee

- a. Age
- b. Sex
- c. Civil Status
- d. Highest Educational Attainment
- e. Status of Employment
- f. Years of Working Experience in the Shop
- g. Trainings/Seminars Attended in the last 3

years?

1.3. Profile Characteristics of the Machine Shop Industry in terms of the following variables

- a. Management Organization
- b. Number of Years in Business
- c. Type of Registration
- d. Level of Capitalization
- e. Sources of Funding
- f. Services Offered
- g. Number of Employees/Workers
- h. Wages/Salaries?

1.4 Availability of Facilities and Equipment?

2. What are the management practices of the Machine shop Industry in Pangasinan along;

2.1 Implementation of Safety Precautions, Rules and Regulations

2.2 Benefits of Employees

2.3 Prospects for Development?

3. Is there a significant difference between the responses of employers and the employee along the management practices of the Machine Shop Industry in Pangasinan?

4. What development plan can be proposed to enhance the management practices of the Machine Shop Industry in Pangasinan?

II. METHODOLOGY

This part of the study presents how the study was conducted; it includes research design, sources of data, instrumentation and data gathering, and the tools for data analysis.

Research Design

To arrive at a reliable, accurate and correct interpretation of data, the descriptive- survey method was utilized in this research. Descriptive surveys intended to gather data on the actual present settings of a particular group of individuals, events, or phenomena (Zulueta & Perez 2010). Calmorin and Calmorin (2007), defined the descriptive design as the study focuses on the present condition, with the purpose of finding new truths

It made use of the descriptive method since it involved gathering of information on conditions or relationships existing at a particular period. It also describes and elaborates the nature and causes of an existing phenomenon at the time of the study.

The study describes quantitatively the data that were gathered thru the questionnaires. The data was crosscheck or supplemented by means of casual interviews, perceptions, and observations that the researcher will do for the data gathering process.
Instrumentation and Data Collection

The main tool used in gathering the data of the study was the questionnaire, which was devised by the researcher himself after intensive readings on related materials from journals, magazines, books, and articles from the world-wide-web related to machine shop practice. It consists of the profile characteristics of the employer, profile characteristics of the employee, profile characteristics of machine shop industry and the management practices of the machine shop industry in Pangasinan.

Two sets of questionnaires were used. One set of questionnaire was given to the employee. Another set of questionnaire was used for the employer. This is so because there were questions that is concerned only with the employer and that the other sets of respondents could not relate with the items. Moreover, the separation of questionnaires made the data gathering process more specific and more convenient.

Set A questionnaire (see appendix C) was specifically for the employer. The questionnaires were divided into four parts. The first part dealt with the profile characteristics of the Employer. which includes age, sex, civil status and highest educational attainment and the years working experience in a machine shop.

The second part dealt with the profile characteristics of the Machine Shop Industry. It

includes the management organization, numbers of years in business, types of registration, level of capitalization, sources of funding, services offered, number of employees, and the wages/salaries.

The third part dealt on the Availability of Facilities and Equipment which consist of the Provisions of the Facilities and Equipment.

The last part dealt on the management practices of the machine shop industry in Pangasinan. This are the Implementation of safety Precautions, Rules and Regulations, the Benefits of Employees and the Prospects for Development which are to be rated using the 5 point rating scale.

Set B Questionnaire (see appendix D) is intended for the employees. The questionnaire is divided into two parts the first part dealt on the profile characteristics of the employee same as to the employer.

The last part is also the same of the last part for the questionnaire for the employer.

Validity of the Instrument

To establish the validity of the questionnaire, it was subjected to the pooled judgment of experts in the field and also the expert on questionnaire preparation. Validation helped confirm whether or not the questionnaire asked what exactly the researcher wanted to know and in order to answer the researchers' objectives (SarojNeupane 2015). The comments and concerns of the six experts (Three Research Coordinators, One PSME President, One Industrial Technology Chairman, One PTBI-In charge) were noted for further improvement prior to the distribution of the questionnaire. The questionnaire was also submitted to the thesis adviser for final evaluation. After incorporation of the ideas and suggestion of the adviser, the questionnaire was reproduced to be floated. Based on the validation, it garnered a weighted mean of 4.52 (see appendix E) which means that the instrument was highly valid.

III. RESULTS AND DISCUSSION

The age group of 51-59 has the highest percentage of 33.3%, followed by 40-50 (23.8%), then 29-39 (19.0%), 60 and above (14.3%) and 18-28 (9.5%). Most of the employers are male (76.2%) and Female (23.8%). This percentage is basically from the idea that machining is for male activity. Almost all of the respondents are Married (85.7%). In terms

of Educational Attainment, half of the respondents are College Graduate (52.4%), followed by One-year Vocational Course

Most of the respondents has an age group of 40-50 (45.2%), followed by 29-39 (21.4%), 51-59 (16.7%) and 18-28 (14.3%). Lastly, 60 and above (2.4%). The employees are dominated by Male (92.9) and Female is only 7.1%. Likewise, the Civil Status of the employees presents that almost all of the respondents are Married (85.7%) followed by Single (9.5%), then both Separated and Widower with 2.4%. The highest percentage for Educational attainment of the employee is Two-year Vocational Course (28.6%), followed by High-School Graduate (21.4%), then One –year Vocational Course (16.7%), College Level (14.3%), High –School level (9.5%) and Elementary Level (2.4%).

Almost all of the employees are Regular-Permanent (83.3%) followed by Part Time (11.9%), Both Regular-Temporary and Contractual (2.4%). Number of years of the employees working in the Machine Shop presents, 1-9 (50.0%), followed by 10 – 19 (31.0%), 20-29 years (11.9%) and 30 years and beyond (7.1%). Most of the Trainings attended are Mechanical Technology (38.2), Welding TESDA Training (Welding Experience) (11.8) Fabricating Technology (44.1) and Foundry Technology (5.9%)

The courses or Area of Specialization of the employees are Machine Shop Technology (69.0%), Electrical Technology (16.7%), Automotive Technology (9.5%) and Electronics Technology (2.4%)

The availability of the Facilities and Equipment used in the Machine Shop industries is rated Least available with Average Weighted Mean of 1.8962.

The management practices of the machine shop industry in Pangasinan in the implementation of safety precautions, rules and regulations is Moderately Implemented with an Average Weighted Mean of 3.4052.

The management practices of the machine shop industries in the prospects of development in which respondents rated Agree with an Average Weighted Mean of 4.0619.

IV. CONCLUSIONS

Based on the findings of the study, the following conclusions were formulated:

1. Male employers dominated majority of the respondents, ages from 29-39 years old and they are mostly married. Likewise, most of the employers were college graduate and had been managing their Machine Shop for more or less 30 years.

2. Most of the employees were male, married and at their middle age or early adulthood, and a good number of the employees were a graduate of two-year vocational course. Furthermore, almost all employees were regular-permanent, has work experience of not less than ten years, and mainly attended Mechanical Technology training/seminar.

3. On the other hand, almost all of the Machine shops are Single Proprietorship (manager/owner), relatively high numbers were operating for 21-25 years, and the majority of the machine shops were operating with proper permits from the Local Government Units and Department of Trade and Industry. Generally, machine shops have a huge capital of millions of pesos and the sources of funding come from the savings of the owner. They normally offer services such as repair services, repair, and welding of agricultural and industrial parts fabrication. Correspondingly, they employ a moderate number of full-time employees receiving regular salaries on a weekly basis.

4. Almost all of the needed facilities and equipment of a machine shop existed and currently being used by employees.

5. The implementation of safety precautions is the first and foremost priority of the machine shop industries for both the employees and the customer for they are greatly benefited in a way that it provided security and protection.

6. Payments of SSS, Pag-Ibig and Philhealth have shared responsibility of both employee and employer. Likewise, there is a clinic and or a health care provider to look after the health of the employees.

7. People or customers would like to be satisfied with services for the money they spend for the fabricate/manufacture of their products/goods and there was a bright prospects of the machine shop industry there to stay. Likewise, the government agencies would be giving faster and more efficient service due to automation

8. There was no significant difference between the responses of employers and the employee along

the management practices of the Machine Shop Industry in Pangasinan.

V. RECOMMENDATIONS

Based on the findings of the study and conclusions drawn, the following recommendations are offered by the researcher:

1. There should be availability of all the facilities and equipment's in all machine shops industry.
2. Managers/owners must focus on giving benefits that greatly motivate the employees to work harder.
3. Machine shops owners and managers must prioritize the safety and health of their employees.
4. Improve the marketing strategies of the machine for higher productivity that will lead to power in the market of metal industry.
5. Adopt the proposed development plan to enhance the management services of the machine shops.

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