

Achieving 21st Century Manufacturing Status: The African Position

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Abstract

Adam Smith [1] outlines, in his book Inquiries into the Wealth of Nations, that the annual labor of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes, and which consist always either in the immediate produce of labor, or in what is purchased with that produce from other nations. The stagnant nature of manufacturing in Africa prompted this study, despite her overwhelming population, cheap labor costs, and abundant natural resources. In this article, the paradigms of 21st century manufacturing are analyzed, in addition to the positive effects of population growth, and labor cost on industrialization. On the contrary, population growth seems to impact negatively on African countries, relative to other populous countries with equivalent potential. Inasmuch as it is alleged that manufacturing partly originated from Africa in the contemporaneous society of Egypt, around the 3000BC, and some promises shown by the Nigerian manufacturing sector in the early 70s and 80s, little to none has been contributed by Africa in the 21st century manufacturing paradigm. Nigeria, being the most populous country in Africa, is the case study. Data from the World Bank indicators and other reputable institutions were used to examine the situation, possible causes, and probable solutions to this stagnation.

Keywords: Manufacturing Output, Africa, Nigeria, Population, Labor Cost

1. Introduction

It can be safely inferred, that the produce of labor is the backbone of any successful or unsuccessful country. Civilized and thriving nations' output is so great, especially due to their productive powers of labor, that it may enjoy a sizable share of necessaries and conveniences of life than is possible for unproductive countries to acquire. This produce of labor can be termed Manufacturing Output. Experimental observations from developed and various emerging economies have depicted that the manufacturing unit of the economy tends to influence the entire economy's performance and steadfastness. Similarly, without a conducive environment for manufacturing to thrive, this aspect of the economy becomes stagnated, and constitutes a burden to the society. A significant stimulant to manufacturing output is labor costs, which has a direct bearing on the population of a nation.

Manufacturing is thus the backbone of any industrialized nation. The business dictionary [2] defines manufacturing as the "process of converting raw materials, components, or parts into finished goods that meet a customer's expectations". It further describes that manufacturing

commonly employs a man-machine setup with the division of labor in a large scale production. Even the simple definition shows the historical trend of manufacturing. For hundreds of years, manufacturing was done by physical labor, in which a person with hand tools used craft tools to create objects. If it were not for the inventions and

discoveries, and of the humans who invented them, we would be living a life of privation and drudgery, grubbing out a meager existence with hand tools and muscle power. That's just what our ancestors did for millions of years, before the Industrial Revolution burst upon the world about 200 years ago.

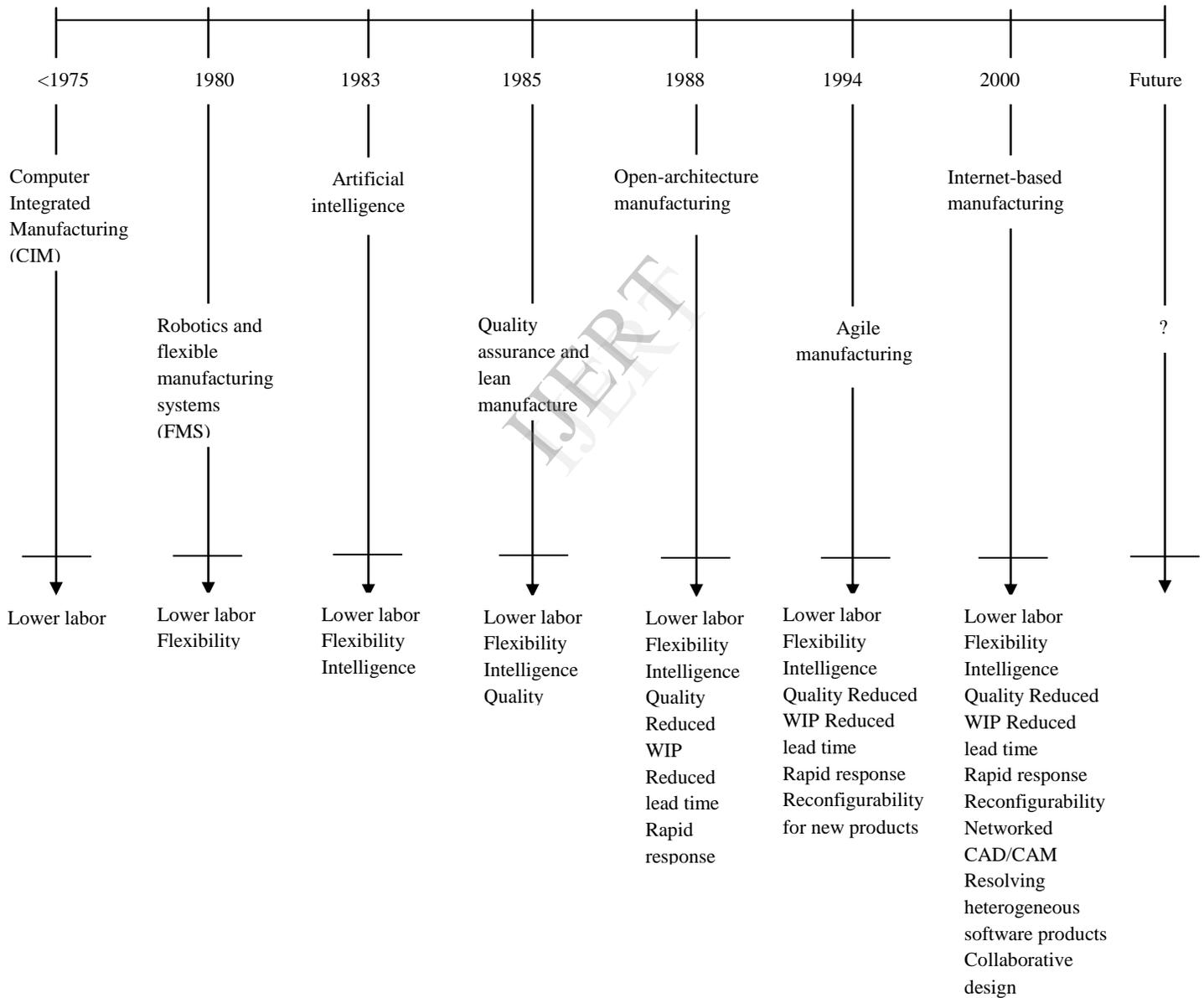


Figure 1.1 Major Paradigms in Manufacturing, Dates, and System Characteristics [3]

The Industrial Revolution spawned small companies, a feature of which was good face to face communication and collaboration between them (this situation was ideal for excellence in manufacturing). As companies grew, departments sprung, which eventually became isolated from each other and led to bits and pieces approach to manufacturing. In the 1950's, the advent of the digital computer and associated technology and its initial application to manufacturing was seen as a groundbreaking event. With this technology, the possibility of realizing automated and programmable control over manufacturing operations and processes was introduced. Following that, in the 1960's, the computer was recognized as an extremely powerful system tool and spawned a new understanding of the nature of manufacturing-manufacturing as a system. A host of new concepts were introduced that enabled the practical implementation of the systems approach to manufacturing, foremost of which was Computer Integrated Manufacturing (CIM). Several other consecutive concepts were introduced, as depicted in fig 1.1, with their accompanying benefits improved upon as time progressed.

2. Population, Labor Cost, and its effect on Manufacturing Output

In this article, it is inferred that population growth is sparingly proportional to manufacturing output, according to the most recent indicators from, the World Bank's data sets and various reliable institutions, as shown in fig 1.2. The most populous countries around the world have reasonable manufacturing outputs to show for, in comparism with sparsely or moderately populated countries. Furthermore, lower

wage costs in addition to soaring population may lead to increased profitability in manufacturing, which in turn spurs growth.

Baldwin [9] noted in his work, *The Path to Strategic Success*, that the determining factor in competing with price is lowest cost. Very simply put, if you are not the lowest cost producer of a commodity item, you will remain in the market place only as long as your lowest cost competitor wants you to remain viable in this arena. At any time, the lowest cost producer can decide to monopolize the market place by lowering its selling price below your cost of production. Inevitably, sooner or later, you will be forced out of that market place. This is the direct effect of cheap labor cost.

In addition, Zhou [4] noted in his work, *Population Growth and Industrialization*, that population growth is a double edged sword, capable of providing a greater number of workers and a larger market for the manufacturing sector, and otherwise.

Furthermore, Chao [5] adds in his work, *Man and Land in Chinese History: An Economic Analysis*, that newly available historical data strongly indicate that at least in traditional China, population growth was an independent and exogenous variable in which the people responded by adjusting their production technology and economic institutions. These theorems and assumptions further buttress the point that increased population, in addition to reduced labor costs may spur manufacturing output, at least in a decent scale. From the data in fig 1.2, it can be noticed that Nigeria is far behind in terms of manufacturing output, whereas it measures up in other indicators such as population and lowest labor cost.

S/no.	Country	Population	Manufacturing Output (US\$)	Approx. Minimum wage (US\$)
1	China	1,344,130,000	1,756,621,184,412.09	2,100.00
2	USA	311,591,917	1,771,400,000,000.00	15,080.00
3	India	1,241,491,960	238,621,041,806.15	1800.00
4	Brazil	196,655,014	308,125,382,457.89	4,304.00
5	Indonesia	242,325,638	205,632,519,107.89	2,736.00
6	Nigeria	162,470,737	3,723,231,982.91	1,543.00

Fig. 1.2 Populations, corresponding Manufacturing Output, and central Minimum Wages of World's Populous Countries

3. Africa's Position: The Nigeria Case

Nigeria is the most populous country in Africa, with relatively low labor cost in comparison with other countries in our scope of study (China, USA, India, Indonesia, and Brazil). Fig. 1.2 shows that Nigeria is below par with its contemporaries, in terms of manufacturing output. Nigeria's over 160 million population deserve better than the meager USD 3 billion annual manufacturing output. Additionally, with significantly low labor cost, she still cannot turn the tide in her manufacturing industry's ailing status. At a time Nigeria should be competing with the likes of South Korea, Brazil, etc, for modern manufacturing techniques, she's still languishing in the shadow of her old self. From a middle income nation in the 70s and early 80s, Nigeria today is certainly among the 30 poorest nations in the world [6]. The path to economic recovery and growth will require increasing production/manufacturing output. Ironically, middle income countries like Brazil, India, Singapore, Indonesia, etc have embraced boosting productivity

schemes as an integral part of their national planning and today, they have made significant progress into the world's industrial markets.

The Central Bank of Nigeria [6] outlined various factors that inhibit the Nigerian manufacturing sector which include;

- i. Low levels of technology, since innovations propel industrialization.
- ii. Non-optimized capacity utilization. Natural resources are underutilized thereby aiding illegal exploration and exportation.
- iii. Due to the fragile security situation in Nigeria, most direct foreign investments have disappeared, making the country highly reliant on foreign imports.
- iv. High cost of production, this is due to failed infrastructure, especially regarding power supply and efficient transportation.
- v. Neglect of Agriculture and extreme reliance on crude oil income. A

nation should be relatively self sufficient agriculturally, so as to channel its development efforts towards increased manufacturing output.

The various aspects of modern manufacturing described in fig 1.1 are “news” to Nigeria, as she cannot match the pace of advanced of manufacturing in the 21st century. Following this article’s assessment (fig 1.1), one commanding factor in 21st century manufacturing is reduced labor cost, which Nigeria has in abundant supply.

4. Possible Solutions to Africa’s Manufacturing Position: The Nigeria Case

High productivity in African manufacturing industry, particularly in Nigeria, is a necessary condition for the sector’s recovery, achieving competitiveness, boosting the GDP, and uplifting the standards of living of the people. Achieving high productivity will require a courageous solution to the problems discussed in the previous section. Various steps that must be taken will include the following:

- i. **Technological Capacity Upgrade:** The manufacturing sector needs to improve productivity through upgrading of its technologies. Technology can help to improve productivity in four major ways: better machinery that can reduce production time and costs; better methods and process controls; breakthrough into completely new ways of doing things and product designs that can improve competitive edge and further reduce costs. Most machines that are now in use are obsolete and the cost of maintaining

them is outrageous. They should be replaced with modern machines that have efficient output, better product designs, and faster processing. From fig. 1.1, it is obvious that computerization of processes and procedures can save time and costs. Simultaneously, building local capacity to produce appropriate technology should be encouraged through continuous on the job training, enhanced research and development efforts, and the promotion of technological education in the school system.

- ii. **Reducing Cost of Production:** Controlling production costs should be given priority attention in productivity management. It should aim at reducing waste and optimizing the use of resources. Adoption of strategic planning is one sure way of reducing cost and boosting productivity. In as much as Nigeria boasts low labor costs, efforts shall also be made in reducing lead time and streamlining the process of manufacturing, so as to reduce cost of production.
- iii. **Increasing Investments:** Effective investments make for growth and productivity. Capital investments are needed to acquire modern machinery and equipment and appropriate technology; as well as upgrade the quality of the labor force and the environment. This will require a lot of funds which is difficult to source from the banking system. A lot need to be done to solve the problem of capital finance, especially in terms of security. Like mentioned earlier, during the mid 70s and early 80s, there was sufficient Foreign Direct Investment (FDI) to spur

manufacturing output, but the depreciated security situation, and hostile government policies have discouraged these investments. This has to be reverted to and the government must also take relevant steps to encourage FDI's. Also, the government must be directly involved in providing these funds in the form of tax rebates and subsidies to manufacturing firms.

- iv. **Reducing Dependence on Imports:** Reducing dependence on imports for industrial goods will have the impact of cutting cost in the long-run, increasing value added and boosting productivity. This will call for improved research and development efforts that are demand driven and the rehabilitation of the core industrial projects (CIPs) most of which currently have epileptic progression. This minimized dependency on foreign imports can be achieved by government increase in taxes for non-essential imported commodities. This will spur the local production of these commodities.
- v. **Infrastructural Rehabilitation and Development:** Practical reduction in the cost of production can never be achieved without efficient power supply, accessible road network, reliable telecommunication services, efficient water supply, and various other basic infrastructural amenities. The use of coal for the generation of energy should be encouraged (it is still used in China to power many production plants), to ease the burden on urban and domestic electricity use. Like rightly noted by the Nigerian CBN, that the most effective way of dealing with the problems of infrastructure is to

partially privatize the facilities in such a manner that the public sector will own minority holdings, not more than 20 per cent.

5. Conclusion

Information on manufacturing productivity and modern manufacturing methods seems scanty in Africa (Nigeria as the case study), due to various problems highlighted in section 3. It is not explicitly expected of Nigeria to match other countries, of similar population, in technological advancement and manufacturing output, but it is expected that signs of progress should be made given her relative advantages. The numerical advantage of Africa, in addition to the relatively low labor cost will count for nothing if the points raised in the previous section are not properly implemented. Consequently, achieving 21st century manufacturing and future manufacturing innovations will continue to elude Africa, as long as her enormous potentials (population, reduced labor, and natural resources) are not matched with progressive thoughts and actions towards achieving higher and sufficient productivity.

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