

# JME

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## The Extent and Effectiveness of Innovation Policy Interventions

Jebamalai Vinanchiarachi<sup>1</sup>

### *Abstract*

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*The extent and effectiveness of innovation systems are essentially a function of policy choice. Sustained efforts to strengthen the skill base with innovative policy interventions can convert enclave type labour-intensive operations into horizontally integrated manufacturing, with ever increasing development of manufacturing-complimentary service activities, which enable countries climb the ladder of value addition and technological sophistication. Innovation is imperative to turn out products, complying with international standards and quality control norms. Fiscal incentives like grants and tax incentives can be put into operation only after creating the required preconditions for innovation. In addition to the creation of a pool of technically trained personnel who would emerge as innovative techno entrepreneurs and skilled workers for effective networking, the State should encourage positive spillovers from foreign companies through a variety of instruments for fostering capacity and capability building. High level of education does not necessarily mean the automatic creation of technological dynamism and productivity catch-up if institutionalized inactivity in R&D is not averted. What is needed is the type of national innovation system that facilitates new knowledge being generated by universities, exploited by laboratories and commercialized by firms. With such an interactive framework for technological learning, innovation would occur as a dynamic source of sustainable growth.*

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**Keywords:** *Innovation, Technology, Academic Institutions*

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### Introduction

Available definitions of a national systems of innovation point to new knowledge being generated and disseminated by universities, exploited by relevant institutions and commercialized by dynamic industrial firms that take active part in the process of globalization and capture market niches by continually effecting improvements in processing, design and marketing. The process constantly stimulate the shift from the production of low tech to

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<sup>1</sup> Former Principal Adviser to the Director General of UNIDO, Vienna, Austria.

medium and high products and eventually to sophisticated products which currently account for lion's share of global manufacturing value added and manufactured exports.

The following definitions by eminent resource persons on the subject merit attention:

the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies." (Freidman, 1987)

".. The elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge and are either located within or rooted inside the borders of a nation state." (Lundvall, 1992)

".. That set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation processes. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artifacts which define new technologies." (Metcalfe, 1995)

".. The national institutions, their incentive structures and their competencies, that determine the rate and direction of technological learning (or the volume and composition of change generating activities) in a country." (Patel and Pavitt, 1944)

".. A set of institutions whose interactions determine the innovative performance.. of national firms." (Nelson, 1993)

Such an interactive framework for knowledge dissemination and commercialization may be called the "invisible college" (Best Michael, 2001)

While knowledge is a source and innovation is a force, innovative mindedness essentially stems from a high level of functional literacy rate, i.e., percentage of literatures imbued with enhanced adaptive capabilities and skills to use modern technology and to commercialize new knowledge. At the Crystal Palace Industrial Exhibition in 1851, American goods were at the center of attraction. The surprised British industrial stakeholders, whose forefathers emerged as the pioneers of industrial revolution a century ago, went to the US to find out the reasons. They realized that the productive functional literacy rate in the US was higher than that of England. In the 1980s when Japanese goods successfully penetrated the European and North American markets, the surprised industrial magnates of the US, whose forefathers

transformed a great agrarian economy into a mighty industrial power after the civil war, went to Japan to find that functional literacy rate in Japan was higher than that of the US. Productive functional literacy rate is interpreted in this paper as the percentage of literates imbued with relevant production skills and production-related service capabilities capable of turning out products to capture market niches.

The above skills and capabilities to-day stem from national innovation systems in which universities, institutions, and dynamic firms interact with each other in order to enhance skills that are capable of commercializing new knowledge. European universities were established 600 years before the evolution of industrial revolution. The system of education in those universities had little impact on economic development in general and industrial development in particular for a long time because the then system of industrial production did not demand the type of knowledge and skills required for achieving efficiency gains in productive activities. If the pattern of industrial production today does not create the demand for the type of knowledge and skills required for integrating the local value chain into the global value chain, there will be "system failures".

### **National systems innovation: Technology to unlock the potential**

The national systems for technology development and innovation stresses that innovation and technology development stem from a complex set of relationships among actors in the system, where knowledge and skills constitute factors of production, and the actors include universities, research institutions, and enterprises. For policy- and decision-makers, understanding of the national innovation system can help identify leverage points for enhancing the innovative performance of firms, and competitiveness of products (OECD, 1997). Failure to network among actors and institutions in an interactive learning and innovative framework may make countries bystanders at the global technological feast.

The new paradigm of production points to information-, R&D- and innovation-intensive production technologies, with operating models and organizational structures based on flexible specialization and inter-firm networking. Companies are being increasingly dependent on the complementary resources of other companies and on closer integration with one another with a view to strengthening collective response to competitive pressures. The effectiveness of the new paradigm of production

depends on how quickly companies, the basic structures and institutions of society acquire, assimilate, adopt, adapt and learn to be innovative.

An ideal framework for technology development entails a degree of knowledge and skill flows in an interactive framework that is designed to reduce the distance to technological frontiers and thereby helping firms to withstand competitive pressures for efficiency gains and capturing market niches in an internationally competitive environment. R&D expenditures, patents, production and trade in R&D- and innovation-induced products indicate only a rough picture of innovation systems. Core types of knowledge and skill flows in national systems for technology development encompass (OECD, 1997).

### **Inter-firm technical and research collaboration: Collaborate to compete**

Taiwan's R&D consortia formed in the 1980s and increasingly in the 1990s can stand as typical example of best practice in gaining synergies from complementary human and technical assets of firms and thereby gaining economies of scale in enterprise R&D and technical collaboration.<sup>2</sup>

Taiwan's success in climbing the ladder of technology upgrading rests on a capacity to leverage resources and pursue a strategy of rapid catch-up. Its firms tap into advanced markets through various forms of contract manufacturing, and are able to leverage new levels of technological capability from these arrangements. This is an advanced form of "technological learning", in which the most significant players have not been giant firms (as in Japan or Korea), but small and medium-sized enterprises whose entrepreneurial flexibility and adaptability have been the key to their success in reducing the distance to technological frontiers.

When IBM introduced a new PC based on its PowerPC microprocessor, in June 1995, Taiwan firms exhibited a range of computing products based on the same processor just one day later. Again this achievement rested on a carefully nurtured R&D consortium involving both IBM and Motorola, joint developers of the PowerPC, as external parties (Mathews and Poon 1995). These successes were followed up by many more such R&D alliances in digital communications and Multimedia areas. Taiwan is emerging as a potentially strong player in the automotive industry, particularly in the expanding China market, driven by its development of a 1.2 liter 4-valve

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<sup>2</sup> **The information on Taiwan's R&D consortia draws on Mathew, J** *Catching-up Strategies in Technology Development - With particular reference to East Asia*, **background document, UNIDO Industrial Development Report 2003.**



engine; again, this is the product of a public-private collaborative research endeavor involving three companies, which have now jointly created a new Taiwan Engine Company to produce the product. Thus, the R&D consortium is an inter-organizational form that Taiwan has adapted to its own purposes as a vehicle for catch-up industry creation and technological upgrading. The microdynamics of the operation of these consortia, is therefore a matter of some substantial interest."

The success in technology upgrading was due largely to the efforts of public sector research and development institutes, such as Taiwan's Industrial Technology Research Institute (ITRI) which since its founding in 1973 has acted as the nerve centre and propellant of leveraging of advanced technologies from abroad, and for their rapid diffusion or dissemination to Taiwan's firms. The role of ITRI helped small firms overcome the scale disadvantages. Drawing on ITRI-induced scale advantage inter-firm R&D alliance dramatically enhanced firms' own adaptive capabilities in collaborative product development, leading the country's strong performance in communications products.

These consortia have been generally successful and some of them are more successful than others - but all seem to have learned organizational lessons from the early cases where government contributed all the funds, and research tasks were formulated in generic and overly ambitious terms for the companies to take advantage of them. The more recent R&D alliances have been more focused; more tightly organized and managed, and have involved participant firms much more directly in co-developing a core technology or new technological standard which can be incorporated by the companies, through adoption and adaptation, in their own products.

### **Collaboration between university/public research institute and industries: Serving as a source of dynamic growth**

As the knowledge economy underscores the critical role in technological innovation, collaboration between universities/public research institutes and enterprises has become the center of many studies to find answers to a number of relevant questions:

- Is the linkage between universities/research institutes and industry a dynamic growth impulse across countries that emerged as first and second generations of newly industrializing countries and dynamic industrial locations?

- What have been the benefits and costs of these linkages to the universities/research institutes from the industry perspectives?
- Is there empirical evidence bearing testimony to such linkages leading to the commercialization of new knowledge?
- What policy instrument and mechanisms or institutional relationships have effectively fostered such linkages?
- What are the governing legal norms that effectively foster a high a degree of effective collaboration between university/research institute and industries?
- Is there consensus on best practices in industry-university/research institute cooperation?
- How to reduce the distance to the frontiers of best practices?

As entrepreneurial skills do not automatically enable entrepreneurs to become scientists, the reverse is also true for scientists who cannot use their scientific skills to become dynamic entrepreneurs. An attempt to promote technology and commercialization of new knowledge should not overlook this truism. It is therefore important to establish effective linkages between scientists and entrepreneurs to commercialize research findings. For example, the Medicinal and Aromatic Plant Research Centre, Khartoum, Sudan, has collected a wealth of information from isolated villages of Sudan on the medicinal uses of rare plants that are worthy of patent rights. The research findings are based entirely on the traditional knowledge of the inhabitants of totally isolated villages in Sudan. But related research findings of the Centre turned out to be a dead investment because of the complete absence of commercialization of those findings.

### **Policy implications: lessons from selected countries<sup>3</sup>**

Sources of innovation can be ascribed to formal R&D activities by research institutes, universities, and firms and to an array of non-R&D activities, e.g., the purchase of capital goods. Developing countries are generally considered to be platforms for enclave type assembly operations or at best imitators of technologies, which are generally imported from developed countries. Firms in developing countries are not expected to commit resources to R&D for just re-inventing the wheel. The opening up of their production

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<sup>3</sup> This section draws largely on the research findings of Sunil Mani (2002), whose in-depth research on the changing role of governments in selected countries in respect to domestic technology development efforts, highlight the policies and instruments that worked and failed to work in strengthening national innovation systems.

and trade regimes could facilitate the flow of technology. What is needed is adaptive R&D in view of imported technology being adapted to local conditions. According to Mani (2002), this familiar argument assumes much less significance in the context of a small number of developing countries becoming creators of technologies in their own right. Dwelling on lessons from Singapore, Malaysia, India, South Africa and Brazil, Mani (2002) argues that a mere fine-tuning of the financial instruments, while necessary, is not sufficient enough and that for financial instruments to succeed, non-fiscal policy instruments are required, the most important of which is the policy on human resources development.

### **Singapore**

The electronics industry of Southeast Asia began in Singapore following an investment mission to the United States in 1967 to establish Singapore as an offshore enclave assembly platform. "In the same year" Texas Instruments set up a semiconductor assembly plant to assemble and test simple integrated circuits for re-export to the United States. Following the American influx, transnational corporations from Europe and Japan made deep inroads into the same field in Singapore. Reflecting national specialization, American transnational corporations tended to invest in electronic components (semiconductor and disk drive assembly) and industrial electronics (computer and telecommunications) and Japanese primarily in consumer electronics and electrical products. Singapore's highly responsive education system has enabled local operating units to successively develop high value-adding production activities from the home bases of transnational corporations.

Since the 1960s, the educational system has been continually restructured, with an accent on technical and vocational education below tertiary level to provide a growing pool of skilled workers and technicians; and rapid expansion of engineering, business and computer education at tertiary level. Around 40 percent of the graduates from polytechnics and universities were trained in engineering and technical areas. The proportion of students enrolled in polytechnics and universities

Formal education is supplemented by training in specialized industrial training institutes to produce qualified craftsmen and technicians. The establishment of the Skills Development Fund provides upgrading training for those already employed.

As a result of sustained efforts on strengthening the skill base, Singapore's electronics industry was strategically converted from a labor-intensive

manufacturing operations platform for vertically integrated MNCs to a horizontally integrated manufacturing services cluster with ever increasing development of manufacturing-complimentary service activities such as engineering-intensive product redesign and process automation and complementary business services associated with regional coordination, procurement, development, and integration activities.

The principal objective of the innovation policy in Singapore is to enhance local development of technology through the medium of technology-based small and medium enterprises. The key to this was the creation of a pool of technically trained personnel who would emerge as techno entrepreneurs and also as skilled workers in other firms. At the same time the state encouraged positive spillovers from foreign companies operating in the country through a variety of instruments. Fiscal incentives like grants and tax incentives were put into operation only after a critical mass of this technically trained human resource was developed. In short, the country placed much emphasis on human resource development in the earlier years and subsequently on fiscal measures. This is an ideal sequencing to follow for other countries.

The main institutional structure for S&T policy in the country used to be the Singapore Science Council. This was revamped in 1991 to become the National Science and Technology Board (NSTB) under the Ministry of Industry and Trade. All major policies with respect to innovation are formulated and implemented by this agency though in the very recent past some of it has been passed on to another governmental organization, namely the Economic Development Board. The policy instruments and institutions, which the country has used in increasing its R&D intensity, can be broadly categorized into four components, namely those:

Increasing the supply of technically trained human resource; Establishing and further improving physical technological infrastructure Assuring in various types fiscal incentives. Promoting techno entrepreneurship and venture capital; Engineering increased positive spillovers to local companies from foreign companies

As a result, today Singapore is able to produce small hardware parts with high degree of precision and participate effectively in product areas that are characterized by monopolistic and oligopolistic conditions.

In contrast to Singapore's star performance, Malaysia's electronics industry is stranded at the bottom of the ladder of value added. It accounts for half

of Malaysia's total exports and employs a quarter of the manufacturing labor force.

## **Malaysia**

The competitive advantage of Malaysian electronics has shifted from low wage, labor-intensive manufacturing activities organized by foreign-based multinational companies (MNCs) to low cost, rapid ramp-up, high volume, increasingly automated manufacturing activities with special capabilities in assembly, testing, and packaging of semiconductors and hard disc drives. Nevertheless, the Malaysian electronics industry has reached a critical impasse: it is caught between lower-wage rivals that are imitating Malaysia's present production capabilities and higher-performance rivals with superior production and innovation capabilities. Raising per capita income depends upon developing higher value adding production activities (Best, M. 2001, UNIDO background paper to its Industrial Development Report, 2003).

In terms of incentive systems and institutions, the country compares very favorably with Singapore and indeed even with developed countries such as Japan and the US. However, in terms of enrolment ratios at the tertiary level, the country does not rank high compared to Singapore, Japan and the US. However, it is not merely to increase the enrolment ratio *per se*, but enrolment in Science and Technology related subjects that matter. Until the government commits itself to a concrete strategy in this direction, mere provision of even sophisticated fiscal instruments for encouraging innovation is unlikely to bear fruits. It must be emphasized that on the demand or innovation side, enterprises in both Malaysia and Singapore are subjected to the same or very similar pressures in view of their export-oriented manufacturing sector. Another important contrast between the two countries is the fact that Malaysia does not have any specific instruments to engineer positive spillovers from the numerous transnational corporations that operate in its manufacturing sector. This is because the country does not have a strong technology-based small and medium sector that can be a stable source of supply. What Malaysia lacks is some fine-tuning in its human resources development policy.

## **India**

By international standards, the technological infrastructure of India is fairly sophisticated, but less than proportionate to the potential. Despite country being blessed with the largest pool of scientists and engineers, the country's innovation-and research-intensity is one of the lowest. Limited research grants for enterprise-level research are largely utilized by public

sector enterprises. The network of institutions and their interactions with labs and enterprises, despite efforts to enhance it in recent years, are still not extensive due partly to low demand for innovations from the enterprise sector.

The paradox of having the largest pool of scientists and engineers and their shortage for R&D and innovation at the enterprise level will need to be addressed with an effective proactive innovation policy that spells out more attractive incentive systems for enterprise R&D.

### **An agenda for action: Practical perceptions**

Much of the traditional wisdom about how companies compete in an internationally competitive environment needs to be overhauled. It is becoming increasingly evident that R&D at all levels is crucial, not necessarily to innovate new things but to learn, acquire, and adapt new technologies. One of the major reasons for the emergence of dynamic industrial locations across countries is ascribed to the presence of high quality academic institutions in those locations and an excellent academic culture that constantly disseminate knowledge for commercial exploitation by intermediate institutions and firms. These institutions act as nuclei for growth by the creation of talent. University- R&D institutions and linkages act as potential sources of dynamic industrial growth in those regions. The message is clear: strengthening of the national industrial innovation system comprising universities, institutions and firms is the panacea for fostering industrial progress.

Industrial R&D and innovation is one of those activities, which cannot be left entirely to either public research institutions or the private sector. The arguments for this are now fairly well known to be recounted here. Governments will need to put in place a whole host of essentially support systems and instruments. Given this state of affairs, there is no need to commit resources to R&D for just re-inventing the wheel. At best what is expected is to conduct some adaptive R&D since all technologies are location-specific and consequently any technology that is imported from abroad will have to be adapted to local conditions.

The basic issue relates to whether developing countries can stimulate investments in R&D in its enterprise sector by merely fine tuning financial instruments, such as research grants and tax incentives that generally stimulate this activity. For financial instruments to succeed and bear fruit, what is required is non-fiscal policy instruments and the most important is the policy on strengthening the industrial innovation system. It is necessary

to reiterate that as evidenced by the experience of Singapore, the financial instruments for promoting industrial R&D can succeed only if the country has high density of technically trained personnel who can engage in R&D and innovation in an institutional framework that is conducive.

Enhanced capabilities are often measured by the number of patents registered by local firms with no affiliation to foreign firms. It may be worth asking where developing countries' firms stand in this sphere. Most of the firms do not seem to undertake R&D but do engage in a number of non-R&D but technology generating activities such as purchase of capital goods, improving plant layouts, or even disembodied technologies from abroad. While this may be so in the short run, to emerge as an industrially "more developed country", the enterprise sector will require investments in at least R&D of the adaptive type. A few measures to strengthen the national innovative system are discussed below :

### **1. Fostering R&D and Innovative Efforts**

Technological capabilities stem from technological efforts. Using a set of parameters related to technological efforts, technological capabilities can be measured. In the past the share of R&D expenditure in GDP was the only indicator used to measure the technological efforts. Now, over 12 indicators, including number of patents registered and number of scientific papers published journals recognized by the Institute of Scientific Information (ISI) is used to measure the technological efforts and capabilities of countries. Having increased the density of scientists and engineers engaged in R&D and innovation, determined efforts should be initiated to disseminate scientific information with commercial potential, and to generate commissioned research projects. A new and strong acknowledgement of the necessity of developing appropriate linkages between basic research, applied research, industrial activities and national objectives should be encouraged among the scientists and the technical personnel, as well as among policy makers.

### **2. Facilitating Knowledge Dissemination and Industry University/ Institution Linkages**

Information is an important intangible resource input, and knowledge is a factor of production in modern industrial production systems. Information poverty makes entrepreneurs isolated. The lack of high quality, reliable and valid information makes entrepreneurs fail to learn right things - leading to waste of money, time, energy, income - and very often go out of business. The UK Competitiveness White Paper (1998) said: "the most dynamic economies have strong universities, which have creative partnerships with

business". While all universities cannot emerge as vanguards of translating research findings into commercial orientation, insight into university research will need to come from intermediate support systems, instruments and institutions in order for university research to see the commercial marketplace. There is increasing evidence of universities across countries following the example of United States universities such as MIT, Stanford and Berkeley, which have become central to local and regional industrial dynamism by virtue of the fact that they teach subjects with practical insights and foresight and produce people with knowledge and skills that serve as the seed bed for new industries, products, and services. They also constitute the nerve centre of effective business networks and dynamic industrial clusters. In order for university education to be relevant, the private sector should be actively empowered in curriculum development to ensure that education and training facilities adapt quickly to entrepreneurial needs, and thereby prepare students directly for employment and not for entry into employment.

### **3. Policy Interventions to enhance Indigenous Capabilities and Skills through Foreign Investment**

Foreign investment flows to enclave-type manufacturing activities often fail to contribute to enhancement of indigenous innovative capabilities and skill development. Strategic policy intervention in terms of incentives and intermediate policy measures is needed to foster the innovative behaviour of foreign investments. A research agenda in this area should attempt to address the crucial issue of selecting appropriate criteria for allowing foreign investment. Country case studies are needed to learn lessons from the experiences of countries that have successfully enhanced their indigenous innovative capabilities and skills through foreign investment. Research findings bear testimony to the fact that to make foreign direct investments create an indelible impact on domestic capacity and capability building, there should be a minimum level of science and technological base.

### **4. Acquiring Tacit Knowledge**

It is important to formulate and implement policies to acquire tacit knowledge that enables firms to make effective use of such subsector-specific know-how. A quantum leap in technological capability is commonly associated with the arrival of technical people imbued with skills and up-to-date knowledge of production processes and marketing. They bring new tacit knowledge capable of enriching firms' technological base and tackling tasks that were previously beyond their competence. The mobility of experienced technical personnel is the most effective means of diffusing technology and, thereby,



enriching competitiveness. For example, the aggressive recruitment of high calibre Korean-American scientists and engineers has been a major source of enhancing competitiveness. Korean firms have developed state-of-the-art products such as new automobile engines, semi-conductor memory chips, electronic switching systems, multi-media electronics, etc, due to acquisition of tacit knowledge through Korean-American scientists and engineers, who earned doctorates at America's finest universities and rose through the ranks of leading concerns in the US. Coveted jobs and attractive compensation packages were provided by the government and firms to attract such personnel, which eventually turned the brain drain into a brain gain. As most of them prefer to be associated with relevant institutions, provision should be made for accommodating such aspirations.

### **5. State-Societal Arrangements on International Competitiveness**

State-societal arrangements influence competitiveness mainly through their impact on the speed of diffusion of new technologies. Labour must be receptive to the introduction of new technologies at the work place; business must be prepared to adopt new technologies in a timely manner, and state must be able to work with both business and labour to maximise the probability that new technologies will be created and diffused rapidly. The receptivity of labour to the introduction of new technologies in the workplace depends on instilling the confidence that higher wages follow productivity increases. This confidence depends on state-societal arrangements to guarantee job security through opportunities for training, to be offered by relevant institutions. In a rapidly growing technological age, when the weakness of labour is the result of a low societal commitment to raising the level of skills in the work force, there is bound to be extensive resistance to the introduction of new technologies in factories. Public institutional arrangements to ensure the means of upgrading skills in cooperation with the private sector are crucial determinants of enhancing industrial competitiveness.

There are many cases of systemic distortions affecting the ability to produce and apply knowledge towards enhancing competitiveness. Industrial policy initiatives attempt to address these distortions. Well-known sources of distortions relate to non-profit research institutions. Much of the innovations of these institutes is not linked to commercialisation, and consequently, they fail to appropriate the full economic benefits of accumulated knowledge or to represent their value as an asset in financial markets. An appropriate

institutional framework within the perspective of public-private partnership for commercialising research findings is crucial.

## **6. Encouraging Multi-Stakeholder Partnerships**

Multi-stakeholder partnerships entail involvement of government, industry associations, business groups, academics, scientists, local communities and inter- and non-governmental organisations to forge partnerships to enhance competitiveness. Such alliances with a wide range of experience and expertise contribute significantly by looking at the entire supply chain, where all stakeholders play their roles efficiently. The Geneva-based World Business Council for Sustainable Development (WBCSD) has set up a Working Group to look specially at the viability of forging such partnerships especially for "greening" the supply chain. WBCSD is currently engaged in devising innovative strategies for the future. The aim is to provide a benchmark that can help stakeholders compare the actual performance against ideal state in order to sharpen competitive tools.

## **7. Promoting Venture Capital/Private Equity**

Venture capitalists are called business angels. Traditionally a large portion of the capital came from banks and other providers of risk money. But in recent years venture capitalists have been breaking through in funding innovative ideas leading to new business ventures. A good venture capitalist takes on a few carefully selected, highly promising businesses, not willing to spend time on businesses that are not going to grow big very quickly. As the new industrial realities are fast changing, venture capitalists are also emerging as portfolio managers, dealmakers and financial engineers, translating innovative ideas into promising business deeds.

## **8. Developing Internal Linkages and Networking**

Interaction and interdependence among firms is one of the fundamental determinants of collective efficiency to withstand competitive pressures. When pursuing innovations, firms interact more or less closely, and interactive learning occurs "in this context" of established institutional framework. Institutional links and inter-firm networking are critical specifically for clusters and industrial districts since interactions are very much associated with collective learning e.g. within user-producer networks. Significant market links are also equally important at each stage of production. The Silicon Valley phenomena are beginning to diffuse to pockets of regional industrial dynamism across countries, and inter-firm networking for learning and innovation is becoming increasingly important.

In this context Regional Development Agencies (RDAs) play a crucial role. Best practices can be traced from the role being played by RDAs in dynamic industrial locations. For example, the Welsh Development Agency in Wales offers a comprehensive programme designed to meet the needs of small and medium enterprises in the region, assist technology transfer between companies, create links between academia and manufacturing companies committed to improvements in efficiency, and learn from others about the changing facets of competitiveness in general and skill development in particular. Yet another example is Scottish Enterprise. It plays a crucial role in bringing together local authorities, chambers of commerce and relevant organisations to support new business in the region. One can cite a number of similar examples of RDAs playing a crucial role in constantly injecting sources of industrial dynamism into the respective regions in developed and industrially more advanced countries. The experiences of these-regions raise a number of issues for developing countries, which endeavour to replicate the best practices of successful RDAs in rendering an array of support services. These range from knowledge built-up in inter-firm collaboration and leads to advanced product and process development through global linkages, to training, advice, technical services, consultancy, testing facilities, design and quality standards, knowledge of legal stipulations, and marketing assistance.

### **To sum up**

Perhaps, Adam Smith (1776) was wrong in saying: "The end of production is consumption." Today, it is being increasingly proved that the end of production is learning, and learning is continuous, serving as a constant source of innovation. The principal source of learning is "market niche," and market niches can be captured only through enhanced adaptive capabilities that are generated by efficient national innovation systems in an interactive framework between enterprises and institutions.

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## Adaptation of the Canvas Model as a Competitive Tool for the MSMEs of Lazaro Cardenas, Michoacan

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### *Abstract*

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*Micro, small and medium-sized enterprises play an important role in the Mexican economy<sup>1/2</sup> mainly in the generation of jobs and their contribution to the gross domestic product. The national development plan 2012-2018 sees them as a strategic lever for national development and the generation of well-being. However, government support has not been sufficient, in part because of the effects of the recent global economic crisis. Therefore, it is necessary to look for different strategies that contribute to their development, avoiding their stagnation and in many cases disappearance. In response to this problem, the present research was born with the purpose of contributing to these economic units by adapting the Canvas business model as a tool that contributes to its competitiveness.*

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**Keywords:** *Competitiveness, Canvas model, MSMEs, business plan*

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### Introduction

Micro, small and medium-sized enterprises are of great importance in the economy and in employment at national and regional level, in both industrialized and less developed countries. Currently the global economic slowdown, including Mexico, generates high unemployment rates, representing micro, small and medium enterprises, an alternative to generate new sources of work and contribute to economic development in its area of influence.

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Currently faced with the country's uncertainty as a result of the massive deportation of immigrants and the renegotiation of the North American Free Trade Agreement, the MSMEs require besides government support for their development, strategies that contribute to their competitiveness, thus generating new entities and the growth of existing ones, thus favoring indicators on employability.

The Canvas model to generate a business plan is an easy-to-use tool designed to add value and contribute to business success. One of the main characteristics of MSMEs is that they are family businesses and are generally run by one or more of their members, lacking a formal structure and the necessary knowledge to establish processes that develop their competitiveness, in an increasingly globalized environment. This simple, precisely-tailored application model can become an alternative for new or existing entrepreneurs to visualize and shape a successful business plan.

However, business models are a response in a given time and space, meeting the needs identified by the authors, but represents a basic tool for their adaptation in different economic, social and cultural environments and scenarios. This is how the idea of researching and adapting the Canvas method for its application in Lazaro Cardenas, Michoacan's MSMEs was born as a tool that contributes to its competitiveness.

## **Background of the MSMEs**

In Mexico, in the official newspaper of the Federation of December 30, 2002, the law was published for the development of competitiveness of micro, small and medium enterprises, with the objective of promoting national economic development through the promotion of creation of micro, small and medium enterprises and support for their viability, productivity, competitiveness and sustainability. Likewise, they increase their participation in the markets, within a framework of growing production chains that generate greater national added value. This law is still enforced, which makes evident the interest in strengthening its competitiveness in the face of increasing globalization. However, support programs have been insufficient. What is required in principle is to know the characteristics and needs of MSMEs, in order to establish strategies that contribute efficiently to their competitiveness.

This law aims to promote the employment and social and economic well-being of all participants in micro, small and medium-sized enterprises. One of the priority challenges of the last administrations in Mexico. According to INEGI data, the growth of the economy has been around 2.3 in the

year 2016 and in previous years the behavior has been similar, reflecting a comparative deficit with the inflation index that during that period was 3.36 percent.

According to data from the last census presented by INEGI, in the city of Lazaro Cardenas, Michoacan, there are 4,816 MSMEs distributed in the main strategic activities as follows:

**Table 1. MSMEs in Lazaro Cardenas in Strategic Activities**

<b>Activity</b>	<b>Number of Establishments</b>
Construction	54
Manufacturing	731
Wholesale trade	193
Retail	3,645
Transport	193
<b>Total</b>	<b>4,816</b>

Source: INEGI (2015)

Considering the data indicated in the above table, micro-enterprises or retail trade represent a figure of 3,645 units, which corresponds to 76 percent of the total number of establishments considered. This justifies that this group of companies is encouraged to consolidate and grow, benefiting the economic environment of the region and the country, through governmental economic and administrative support, modeling tools that are easy to apply and allow to boost their development and competitiveness.

One of the major challenges today is job creation, given the levels of growth of the economy in recent years in the country, as well as the adverse scenario in the face of US immigration policy; all this forces to look for options of employability and internal growth, which require taking advantage of the resources available. Mexico is a country with a very high concentration of smaller companies, especially of the so-called micro, which are 95 percent of the total of companies and absorb 41.83 percent of the total employed personnel. In grouped terms, the PMMEs generate 73 percent of the total employment (Gongora, 2013).

### **Characteristics of MSMEs in Mexico**

In order to understand more precisely the integration of this group of companies, it is necessary to address them individually, as described below:

## **Approach and delimitation of the problem**

The current work of research seeks to highlight the relevant role of the MSMEs in the Mexican economy, mainly in the generation of jobs, as well as a strategy to develop their competitiveness, the Canvas model through an adaptation of the same, attending to the needs and characteristics of the economic environment of Lazaro Cardenas, Michoacan, in such a way that it contributes to the economic growth of the region and the country. From the above, the following question arises: Will the adaptation of the Canvas model serve as a competitive tool for Lazaro Cardenas, Michoacan's MSMEs?

### **A. Objective of research**

Adapt the Canvas model as a business plan tool for Lazaro Cardenas, Michoacan's MSMEs to enable them to develop their competitiveness.

### **B. Assumptions of research**

The identified problem allows the establishment of the following assumptions:

1. MSMEs are more competitive by adopting the adapted Canvas model, as a business plan tool.
2. If MSMEs do not adopt business plan tools like the adapted Canvas method, they will hardly prosper and remain in the market.

## **Justification**

In recent years, in Mexico, taking into account the large number of establishments MSMEs, represent, they have aroused the interest of different levels of government, seeking to establish support mechanisms for their development, without the results being solved to date the problem they face. Micro, small and medium-sized enterprises play an important role in the economic development of nations in both industrialized and less developed countries, as is the case in Mexico (Senado, 2002).

According to the National Survey on Productivity and Competitiveness of Micro, Small and Medium Enterprises, presented by the National Institute of Statistics and Geography (INEGI), the National Institute of Entrepreneurs (INADEM) and the National Bank of Foreign Trade (BANCOMEXT), corresponding to 2015, according to the results, 97.6 percent of the companies considered are micro-enterprises and concentrate 75.4 percent of the personnel employed. These figures reflect the importance of this



economic sector and the need to seek its consolidation and growth, as a response to the low levels of growth of the national economy in recent years, as well as a way to strengthen employment. The following table shows the occupancy numbers:

**Table 3. Number of enterprises by size and personnel employed**

Size	Enterprises		Employees
	Number	Participation {%}	Participation {%}
<b>Micro</b>	3,952,422	97.6	75.4
<b>Small</b>	79,367	2.0	13.5
<b>Medium</b>	16,754	0.40	11.10
<b>Total</b>	4,048,543	100.0	100.0

Source: INEGI (2015) .

The micro companies from the numerical point of view, reveals their outstanding participation by the number of establishments and 75.4 percent of the total personnel occupied by the MSMEs. The small ones represent 2 percent of this group and their contribution to the employment is 13.5 percent of the total, surpassing the mediums that contribute only with the 11.10 percent in this item. This information strengthens the need to attend these establishments, through strategies that ensure their permanence, growth and competitiveness, thus influencing internal growth levels, as well as meeting the job demands of the new generations in Mexico.

The Canvas model for its design is practical and simple to apply. However, the environment of Lazaro Cardenas and the country with particular characteristics requires a molding that is applicable to new and established MSMEs, facilitating the development of a business plan that guides the course of the same, avoiding the improvisation that puts at risk their results in the short, medium and long term.

## **Theoretical conceptual framework**

### **A. Canvas model**

The Canvas model created by Alexander Osterwalder is a visual tool composed by a rectangle divided into nine blocks that transforms the proposal of services or products into economic resources (De Oto, 2016). The Canvas model was created in order to establish a logical relationship between each of the components of the organization and all the factors that influence whether or not it is successful. Through a "Canvas" is detailed from the business idea, to the different factors that will influence it at the moment of putting it into action (Ferreira D. C., 2015)

The business model is divided into nine basic modules covering the four main areas: customers, supply, infrastructure and viability. These nine modules are: (Osterwalder, 2012)

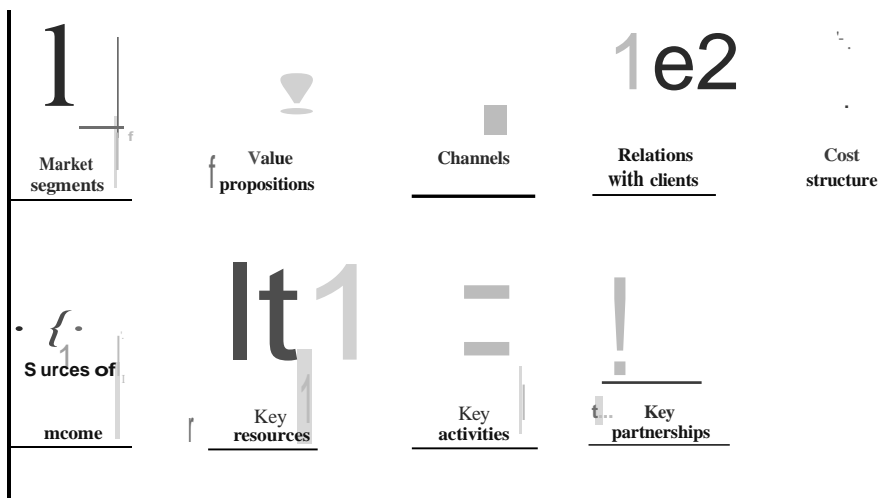
1. Market segments: mass, niche market, diversified, multilateral. This module defines the different groups of persons or entities to which a company is directed.
2. Value propositions: novelty, performance improvement, personalization, "work done", design, brand / status, price, cost reduction, risk reduction, accessibility, convenience / utility. This module describes the set of products and services that create value for a specific market segment.
3. Channels: direct, indirect, proprietary and business partners. It explains how a company communicates with different market segments to reach them and provide them with a value proposition.
4. Relations with clients: personal assistance (exclusive or not), self-service, automatic services, communities, collective creation. It describes the different types of relationships established by a company with certain market segments.
5. Sources of income: asset sales, usage fee, subscription fee, loan / lease/ rent, licensing, brokerage expenses, advertising. It focuses on the cash flow generated by a company in different market segments (to calculate the benefits, it is necessary to subtract the expenses to the income).
6. Key resources: physical, intellectual, human and economic. This module describes the most important assets for a business model to work.
7. Key activities: production, problem solving, platform / network. Consider the most important actions that a company must take to make its business model work.
8. Key partnerships: optimization and economy of scale, reduction of risks and uncertainty, purchase of certain resources and activities. Describes the network of suppliers and partners that contribute to the operation of a business model.

9. Cost structure: fixed costs, variable costs, economies of scale, field economies. This last module describes all the costs involved in starting up a business model.

The previous modules proposed by Osterwalder (2012), for the generation of business models covers four main areas; Customers, supply, infrastructure and financial viability. For your better understanding the following figure 1 is presented. The modules are reflected in a Canvas, in order that the participants can comment on the business model. This proposal is extremely practical. However, as already mentioned, it is necessary to adapt it to the micro-enterprises of Lazaro Cardenas, Michoacan, considering their particular characteristics and the environment in which they are developed.

An important point that does not consider this proposal, is the one related to the initial investment, information necessary for projects of new companies. It is also important to consider the strategic planning in order to identify the direction of the organization. Another important point to consider is the determination of the unit cost, since it is the starting point of a competitive sale price, the structure of the same is mentioned, however its integration is not necessary.

**Figure 1. The Nine Modules**



Source: Osterwalder & Pigneur (2011).

## **A. Business plan**

A business plan is a document written in a simple and precise way, which is the result of planning. This document shows the objectives to be achieved and the activities that will be developed to achieve those objectives {Andfa & Paucara, 2013}. It is a detailed summary of the business, the products and services provided, the business operations carried out, what the future plans are, and the financing to have and what it is required for the business development {Banco de la Nacion, 2013}. A business plan is a guide for the entrepreneur or entrepreneur. It is a document that describes a business, analyzes the market situation and establishes the actions that will be carried out in the future, along with the corresponding strategies that will be implemented, both for promotion and for manufacturing, if it were a product {Ferreira DC, 2015}.

## **B. Competitiveness**

Competitiveness is defined as the quality of the economic and institutional environment for sustainable development of private activities and increased productivity. At the company level, the capacity to maintain and strengthen their profitability and participation of MSMEs in the markets, based on advantages associated with their products or services, as well as the conditions in which they offer those {Camara de Diputados, 2016}. Competitiveness is the set of institutions, policies and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the level of prosperity that can be earned by an economy {Forum, The Global Competitiveness Report, 2014}.

Competitiveness is what allows a company to be successful in the country in which it operates. A company is competitive when it develops services and products whose costs of production and quality are comparable or superior to that of its competitors around the world. It has to have a physical, legal and regulatory environment that contributes to reduce production costs and raise productivity {Cervantes, Ballesteros, & Hernandez, 2012}.

Competitiveness can be analyzed from two perspectives: First, as a set of factors that determine the level of productivity and, secondly, as a determinant of the sustained increase of the well-being of the people. From these perspectives, regional competitiveness can be defined as the management of resources and capacities to sustainably increase business productivity and the well-being of the region's population {Benzanquen, Del Carpio, Zagarra, & Valdivia, 2010}.

### C. Micro, small and medium-sized enterprises

Businesses are a source of income for workers, suppliers, government and entrepreneurs, promote the economic development of the society, contribute to the sustainability of public services, represent a means for personal fulfillment or satisfaction and encourage training and skills development, as well as investment and capital formation (MUnch, 2006). In the Mexican tax sphere, according to the Fiscal Code of the Federation (2016), a company is considered to be a natural or legal person who carries out commercial, industrial, agricultural, livestock, fishing or forestry activities either directly, through a trust fund or through a conduit Of third parties.

In accordance with the law for the development and competitiveness of micro, small and medium enterprises in Mexico, it is defined as micro, small and medium enterprises, legally constituted, according to the number of workers, based on the stratification established by the Ministry of Economy, in agreement with the Ministry of Finance and Public Credit and published in the Official Gazette of The Federation, starting from the following:

**Table 4. Stratification by number of employees of the Economy Secretariat in agreement with the Secretariat of Finance and Public Credit**

Stratification by number of workers			
Sector/Size	Industry	Commerce	Services
Micro	0-10	0-10	0-10
Small	11-50	11-30	11-50
Medium	51-250	31-100	51-100

Source: Law for the Development and Competitiveness of MSMEs (2016).

### Methodology

For the development of the current investigation, the methodology used is an empirical approach with qualitative analysis, based on electronic, literary and scientific sources, as well as government statistical information, thus obtaining information considered useful for the study, by its degree of contribution to the problem to be solved. It is considered a descriptive study because it seeks to specify the properties, characteristics and profiles of individuals, groups, communities, processes, objects or any other phenomenon that is submitted to an analysis (Hernandez, Fernandez, & Pilar, 2014).

In this study, as a dependent variable the MSMES of Lazaro Cardenas, Michoacan and as independent the adaptation of the Canvas model as a tool of business plan that allows them to develop their competitiveness.

## **Analysis of results**

As previously stated, the Canvas model needs to be adapted to Lazaro Cardenas, Michoacan's MSMEs, considering their particular characteristics and the environment in which they are developed. The proposed modules are reflected in a Canvas, in order that the participants can visualize and comment on the business model.

This proposal is extremely practical. However, as already mentioned, it is necessary to adapt it to the micro-enterprises of Lazaro Cardenas, Michoacan, considering their particular characteristics and the environment in which they are developed. An important point that does not consider this proposal is the determination of the unit cost, since it is the starting point of a competitive sale price, the structure of the same is mentioned in the Canvas model. However, its integration is not required. Nor does it contemplate data relating to the initial investment, information necessary for projects of new companies. It is also essential to consider basic marketing, although it is true in this model is considered but in a partial way. Finally, the strategic planning is necessary in order to identify the course that the organization has to take.

These proposed points are described below:

### **A. Unit cost**

Especially for industrial MSMEs companies, it is important to integrate each of the elements that make up the cost per unit produced, as well as the services, to be in possibility once the distribution charges are added, to establish a competitive sales price, to guarantee an appropriate profit margin. For its determination, the following elements are involved:

1. Direct materials or raw material. It is composed of the materials or raw material to be transformed, can be quantified easily and physically identified in each unit produced. The raw material is an important element in the elaboration of a product, since all the materials are susceptible of transformation, which gives rise to a product elaborated different from the conjugated materials and which have full identification with the article produced (Parra, 2009).

2. Direct labor. It consists of the wages and benefits that the production worker receives, that is to say, the one that intervenes directly in the transformation of the materials. The labor represents the effort of the human work that is applied in the elaboration of the product. The labor force, as well as the raw material, is classified in direct and indirect labor. Direct labor is the labor effort applied by workers who are physically related to the production process, either by manual action or by operating a machine (Sinisterra, 2011).
3. Indirect manufacturing costs. It includes concepts such as indirect labor, depreciation of machinery and equipment, maintenance, as well as those expenses that are small and that for their implementation many of them are prorated. In addition to labor and raw materials, there are other types of indirect costs that are needed to manufacture the product or provide the service. They include the costs of the facilities, the equipment used to manufacture the product or provide the service and other support equipment, such as that used for handling materials (Blocher, Stout, Gary, & Chen, 2008).

Commercial companies do not have to integrate the previous concepts, since the products that acquire the purchase price is known as the acquisition cost, which will be added to the distribution costs and the profit margin, in order to determine the sales price. To the extent that these concepts are known, it is possible to optimize them, which translates into greater competitiveness in the market.

## **B. Initial investment**

To start a new micro, small or medium enterprise, it is important to know the capital needed to start it, mainly to define the origin of these resources, either by contribution from the owners, financing by banking or government institutions, and if applicable a combination of these, to be used primarily for:

1. Permits and constitution expenses. In this section are considered concepts like the notary expenses for the constitution, licenses, permits and registrations before federal, state and local authorities.
2. Preoperative expenses. Expenses to be incurred prior to commencing operations, such as; hiring of services, deposit for rental of real estate, previous advertising, salaries, consulting services, among others.
3. Initial cost of production. It is the quantification of the initial production, in his case the inventory necessary to start operations,

in the case of commercial businesses. The establishments that transform raw materials or semi-finished products also consider these concepts, direct and indirect salaries, payment of taxes derived from wages, expenses such as: light, maintenance of equipment, etc. These costs need to be paid and that are concerned to know, in order to have sufficient resources, until the moment the recovery of cash begins for the realization of sales and services. That is, to keep the entity going until the generation of its own resources.

4. Fixed investment. It consists of the fixed assets necessary to carry out the main activity, which are acquired with the intention of being used such as production machinery, land, buildings, transport equipment, furniture, computer equipment Etc.

By having this information, it is possible to quantify the economic resources necessary to start the new company, as well as to define the origin of the resources, either by contribution of the investor (s), if applicable by financing or the combination of both.

### **C. Basic marketing**

The product or service to be placed on the market needs to be preceded by strategies that contribute to its success. Although it is true that there are concepts from previous decades that have been modified by scholars, however, they remain the point of marketing. That is the case of the 4 P's or mix of marketing, which in the model proposed as basic marketing, is added with market segments raised in a separate module by Osterwalder & Pigneur (2011), as well as the identification of the competence that in the following paragraphs is explained in a simple way to facilitate its understanding and application by the MSMEs, as a strategy for their development. The Marketing Mix is defined as a group of marketing tools that are combined to produce the desired response to the target market (Kotler, 2010).

1. Product. Product is any object or thing susceptible to buy or sell, however, there are important aspects to consider before marketing such as the brand, packaging, presentation, advertising phrase and logo among others, that must be planned in such a way that they have a positive impact on the consumer and that contribute to the identification of the good or service and the protection of the same. In addition to make sure the use of name, to register it, in its case to avoid legal problems to use one already existing in the market.



2. Price. For the consumer, the monetary part is important, linking it with the required quality and of course comparing it with the one offered by the competition, in such a way that it must be competitive and it also includes the margin of utility intended by the entrepreneur. In this case, the starting point in the search of alternatives for the optimization of costs. However, in this section the MSMEs must also define the form of payment, be it bank transfer, deposit into account, cash or credit card. Currently, electronic money is widely used in Mexico, partly supported by current tax regulations, which require the use of these means to cover acquisitions and expenses that are intended to be deducted from taxes.
3. Place. In this section, the entrepreneur must analyze and decide how the consumer gets his products, i.e. the appropriate distribution channel according to its own characteristics, looking for it in the appropriate time and manner, without this process having a significant impact on the sales price. It can be shops, direct sales, online, distributors, etc. The location and ease of access to the establishment are very important factors to take into account for better results.
4. Promotion. For any business, it is essential to identify the means to be known, mainly with the market to which it is directed, considering the different habits of the consumers to consult information before making the purchase, such as; Internet, radio, newspaper, exhibition at trade shows, personalized promotion etc. Kotler (2010) rightly states that companies must communicate with current and potential customers, without leaving to chance what they want to communicate. So important is to spread and what it is wanted to make known, to get the consumer to be convinced and make a decision that is favorable.
5. Market segments. As Osterwalder & Pigneur (2011) puts it, companies must select, with a reasoned decision, the segments to be addressed and, at the same time, those that will not take into account. Once this decision has been made, a business model based on a thorough knowledge of the specific needs of the target customer can already be designed. It is definitely crucial that MSMEs identify who their potential customers are, where they direct their product or service, as well as the capacity of the target market's demand. This information will provide relevant information on its market feasibility.

6. Identification of competence. Just as it is important to know the market to which the product or service is directed, it is important to know who and how many competitors, what are their strengths, which are offering to improve them, the quality of their goods and services. MSMEs, when they have knowledge of this, clearly understand that they need to be able to compete and penetrate the market, without their incursion resulting from improvisation.

In the nine modules proposed by Osterwalder & Pigneur (2011), in relation to the value proposition, points such as price, design and brand are addressed. Also in relation to the channels, the aspects concerning the distribution and sale are exposed. However, by practical aspects, it is easier to combine in a single section as presented in the basic marketing that is proposed, taking into consideration that the MSMEs in Mexico are directed by a family member or in any case do not have an administrative structure that offers multidisciplinary knowledge, being necessary to facilitate their assimilation.

#### **D. Strategic planning**

Every organization needs to know its rationale, where to go in order to achieve its objectives, to know internally its capacities and the situation that prevails in the market, that is so propitious or in its absence the turbulences that are presented. Basically, the MSMEs define in this section the following:

1. Mission. Every business has an activity to develop, which registers as an integral part of its constituent document or registration with different government agencies, but beyond the activity is to understand the reason for being the same, the reason for its existence and that each member to know and identify with it, so that it becomes a purpose of the organization. The mission is the *raison d'etre* of the organization, its formulation is a stage of the most important in the planning process; it is a broad definition of the purpose of the organization and the description of the business to which the company is dedicated (Munch, 2013).
2. Vision. Every organization must glimpse its future, as seen in the short, medium and long term. The vision corresponds to the desired future of the organization. Munch (2013), defines it as the statement that describes the desired state in the future. It provides direction and forges the future of the organization by stimulating concrete actions in the present. It is necessary that the organizational objectives, short, medium and long term, are expressed in a specific way, to facilitate

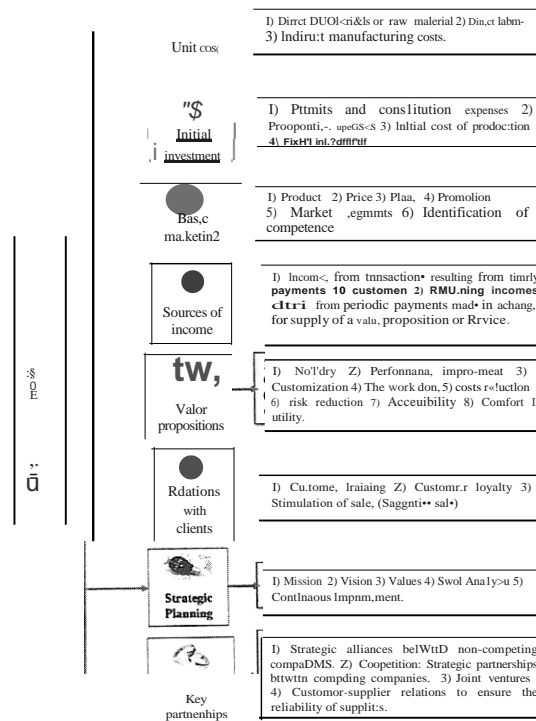
their control over their execution and results. This will make it easier for MSMEs to be sure of the course they should take and to establish preventive or corrective measures in a timely manner, considering the various scenarios that are presented throughout their life cycle.

3. Values. The values instilled in organizations are the governors of the actions of their members; they represent the source of the organizational culture. It defines the set of principles, beliefs, rules that regulate the management of the organization. They constitute the institutional philosophy and the support of the organizational culture. The basic objective of the definition of corporate values is to have a frame of reference that inspires and regulates the life of the organization and therefore what is being asked both of the employees of the same, as in customer service {Morales, 2014}.
4. SWOT Analysis. It is a tool for MSMEs to analyze internally their qualities in the same way their fragility as an organization and of course it is also a way to explore the environment to visualize its relevance and the challenges to face. These types of companies have great strengths, which ultimately define their success, so it is important to know them to exploit them to the maximum, taking into account the weaknesses that in their case constitute an obstacle in the achievement of their objectives. The SWOT analysis is a diagnostic tool used by a company or organization with the purpose of intervening professionally both in the formulation and application of strategies and in its monitoring to make an evaluation and control of results. It consists of an evaluation of the strong and weak factors, which diagnose the internal situation of an organization, as well as the external evaluation, marked by opportunities and threats {Valda, 2012}.
5. Continuous improvement. It is a concept from the previous century, however, organizations are currently facing a very popular competition in the markets, the changes occur in a very dizzying way, a situation that forces MSMEs to establish a philosophy focused on increasing the quality of the product or service as well as optimize the processes so that they satisfy the needs and requirements of the clients, thus managing to preserve them and attract new ones. The SWOT analysis identifies the weak points for establishing solutions, through strategies such as training, review of processes, controls, etc., to raise productivity.

It is important to establish a management system for quality that is clearly oriented to processes and continuous improvement. Organizations will achieve leadership as long as they have the ability to maintain the excellence of their processes and commit themselves to the constant development of their objectives, always oriented to the satisfaction of their clients (García, Quispe, & Paes, 2003).

The proposed model is made up of eight modules, including unit cost, initial investment, basic marketing and strategic planning, retaining Osterwalder & Pigneur's (2011) revenue source, value proposition, customer relationship and partnerships Key, remaining as follows:

**Figure 2. Analytical Canvas business model adapted to Lazaro Cardenas's MSMEs**



Source: Own elaboration based on Canvas model of Osterwalder & Pigneur (2011).

In the previous figure comparing it with the one proposed by Osterwalder & Pigneur (2011), the following modules were suppressed:

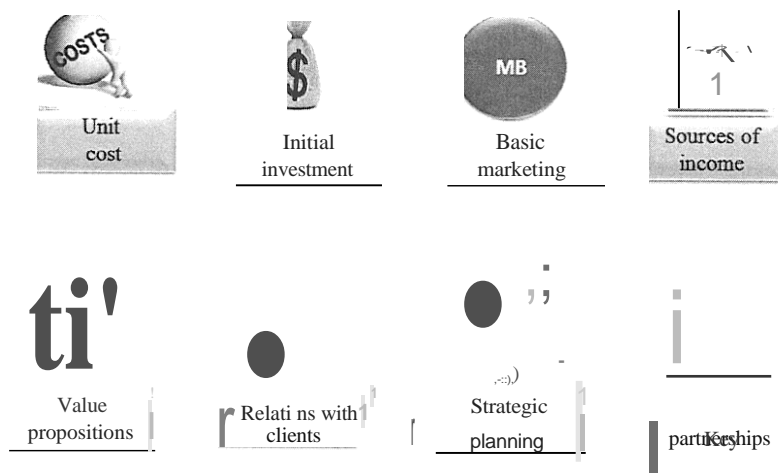
1. Key activities
2. Cost structure
3. Key resources
4. Market segments.
5. Channels

The tasks corresponding to them were included in the sections that were added, in a more specific way, facilitating their application and understanding, mainly considering the characteristics of those who lead the LMEs in Lazaro Cardenas, Michoacan, the following are the modules that were added:

1. Unit cost
2. Initial investment
3. Basic Marketing
4. Strategic planning

The proposed business model keeps an order according to the information needs that are occupied for its proper application, likewise can be translated into a Canvas to facilitate its development, as presented in Figure 3, containing the main data, for each module to disaggregate the specific information mentioned and summarized in Figure 2.

**Figure 3. Canvas business model adapted to Lazaro Cardenas's MSMEs**



Source: Own elaboration based on Canvas model of Osterwalder & Pigneur (2011).

## Conclusions and Recommendations

MSMEs, because of their contribution to the Mexican economy, represent an important development factor, mainly due to the different challenges to be faced in the renegotiation of international trade agreements with the United States and Canada, as well as the migration policies in march with the country of the north. Therefore, these companies also require stimuli to ensure their development, strategies that allow them to know their business model in a systemic way, visualizing the main processes that comprise it in order to analyze them, understand them and direct their efforts to achieve their objectives within an atmosphere of certainty.

To this end, the present research concluded with the adaptation of the Canvas model to Lazaro Cardenas' MSMEs, Michoacan, as a strategy to generate their competitiveness, considering a simple development for their better understanding, taking into account that these companies are directed by a single person who performs different activities and is usually a member of the family. That is to say, they do not have an organizational structure that guarantees specialized multidisciplinary activities. However, through the proposal presented, in a simple way, the strategic points that develop the vital activities of the organization embodied in a Canvas model can be approached. With the above contribute in the development of its competitiveness.

The Canvas model adapted to Lazaro Cardenas's PMYMs can be used in any organization, even to be modified according to the characteristics of each environment; the case may be, to the prevailing economic, political and social reality, since economies are not static, changes continue to occur, so the proposals are susceptible to changes and adaptations. In terms of results, it is recommended that these establishments, mainly micro-enterprises, are integrated into the formality as part of the taxpayer base, simplifying their incorporation, so that the benefits are reflected in the employability with respect to the benefits that are deriving and collecting taxes in a fair and equitable manner, without incurring additional burdens or complex compliance processes.

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# Marketing Development Strategy in Chinese Companies Working in Medical Devices Industry

Bert Wolfs<sup>1</sup> and Bayan Konirbay<sup>2</sup>

## *Abstract*

*This article describes the peculiarity and marketing strategy development for the quick growth of Chinese companies working in the Medical Devices field in the international market. This strategy is analyzed through the perspective of Chinese traditional values, particularly based on the work of Sun Tzu: The Art of War; where the main strategy principles mentioned are moral virtue, foreknow/edge, dispositions, adaptability, and strategic advantage. The researchers use interviews with top and middle level managers of several companies and their own experiences to describe the policy of marketing activities undertaken by these Chinese companies in recent years.*

**Keywords:** Chinese Companies, Chinese Culture, International Market, Marketing Development, Medical Devices, Chinese Companies, Strategic Factors.

## Introduction

Even if global economies are struggling today, the medical devices industry is still undergoing the development process. Market growth rate is supposed to increase by 4.4 percent every year and in 2018, it should reach \$440 billion (Research and Markets, 2015). This growth in China, with special government policy focused on development of local manufacturers and the "technology sharing process", created a platform for a large group of Chinese companies to focus on the research and production of reliable, quality medical devices. The global economic climate and cost restrictions of the budget in every country, partnered with the exponential growth of the global population forced medical device companies to explore more and more markets (Doucet, 2005). As the economic growth of European countries and U.S. getting slower, new markets in Latin America, CIS, India, Asia and Africa show positive and very significant changes. In order

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to succeed in these countries and win the competition among all of the producers, medical companies need to find a specific strategic approach; they should have to find an approach through understanding the unique cultural environment of the markets and the potential opportunities in every country. This requires a strong understanding of current situations and models that have been used by other companies. The healthcare business is a business with high quality demands such as new technologies for medical devices focused on less-invasive medical treatment as well as reduction in the rehabilitation process and cost-reduction process (Zhou, 2007).

A peculiarity of Chinese companies is based on the model that began with creation of high-tech products in the medical field from 'nothing'. Within one decade, these companies have become real competitors of the giant conglomerates such as GE, Phillips, and Siemens-all of which have more than fifty years of history in the global marketplace (Xu and Hang, 2009).

Strategy could be defined as the achievement of goals through the adaptation of limited resources. A strategy itself is a type of pattern of activities an organization uses to develop in a certain environment (Kim and Hwang, 1992). According to Miller (1988) strategy is a pattern in a stream of decisions. In the same way Porter (1980) differentiated the strategy, like product development, market penetration, and its formulation on the corporate level, where the work of top managers is dedicated to transferring certain ideas into strategic business units. In order to fully differentiate the strategy of Chinese companies, the researchers offer to use market orientation and the mode of entry factors, with five basic strategic factors of Chinese culture mentioned in the work of Sun Tzu- "The Art of War", such as moral virtue, foreknowledge, dispositions, adaptability and strategic advantage (Griffith, 1963).

It is very hard for China to create a second Medtronic or Johnson & Johnson in several years, but one still can see the rapid development of companies like Mindray, Lepu, Wego, Shinva, and Neusoft (Renstorm, 2008). Mindray has more than 900 exclusive distributors in the domestic market and more than 5,000 distributors on the world market with nearly 8,000 employees in total. It had set up 20 overseas sales offices and sells equipment in 140 countries (Zakreski, 2010). From another point China's medical devices market is now the third largest in the world after the USA and Japan. The demand is growing proportionally and with an increasing number of newly opened small and middle level hospitals-opportunities for new, local, medical devices' manufacturers has been created.

Medical devices, as a business, need a substantial number of investments in the research and development area. It also requires significant investment in clinical test reports as well as collaboration with the doctors and nurses who are going to use and accept this equipment. The most interesting point regarding Chinese manufacturers is that the amount of the first investments, in most of the cases, was equal to \$200-500 thousand USD with 10-40 people initially employed. This was regarded as a very small investment if we consider the medical device sector. Today, the revenues of these companies have already exceeded \$50 million USD per year. In China, due to the high level of competition, companies need to focus on improvement of organizational structure. As Chinese enterprises start to turn their attention to strengthening their ability to compete in the global economy, they have a new challenge-developing international expertise. Chinese-style of business or Chinese traditional characteristics of organizations or management styles are really different from Western (Bond, 1986), that is why this study is going to focus on some of them.

### **Chinese strategic culture**

It is very hard to define the meaning of strategic culture. According to Andrew Scobell, it is a persistent system of values held in common by the leaders or group of leaders of a state concerning the use of military force (Scobell 1999). Strategic culture consists of common beliefs, cultural assumptions, and behavior of individuals, based on shared experience and collective identification of a group's relationship (Delios and Henisz, 2003). Research by Nisbett (2003) provided evidence that social differences between different cultures have an influence not only on beliefs, but also on the way of thinking. Group organization, behavior of individuals and the values of every person could be easily differentiated according to the cultural origin of the person. Social organization directs attention to certain aspects of reality at the expense of others (Price, 1996; Chang and Xu, 2008). Everything what people pay attention to affects their beliefs about the functioning of the world and causality. For example, whereas Western civilization is dominated by personal orientation, Chinese culture emphasizes reciprocal social obligation and collective mindset. Chinese believe that people are part of a collectivistic society and that the behavior of the individual should be guided by group expectations (JFCOM, 2010). The study of Johnston (1995) describes strategic culture in Chinese history and compares it with emerging conditions of Chinese economy in modern times. Nisbett (2003) stated that the cognitive way of thinking for Chinese contradicts is a combination of two different questions and finding the truth for both of them. Chinese culture emphasizes only two philosophical concepts which can describe the

culture: "the concept of change" and "the concept of whole". What is the most interesting is that both of these concepts must exist simultaneously. Nisbett (2003) creates three approaches: "the Principle of Change, which emphasizes the constantly changing nature of reality; the Principle of Contradiction, which states that the constant state of change causes things to have contradictory characteristics such as new and old, or strong and weak; and, the Principle of Relationship, which states that nothing exists in isolation and that knowing something requires knowing its many relationships" (pp. 174-175). The Western approach is directed to material goals and the world, in the perception of Western people, is unchanging and concrete. The world for them consists of individual parts which stand alone. The approach of Chinese philosophy regards the world as a complex system where, everything is based on the relationship between every part (Ahlstrom and Bruton, 2002). So Chinese thought is not always very logical, because from their perspective one needs to shape and interact within the system in order to understand it, not just manage individual parts. It is very interesting that in the study of Johnston (1995) Western children grouped the chicken and the cow in one category (animals) while Chinese children group the cow and the grass together-cows eat grass. If we will consider the medical business we can find that Chinese companies in the beginning actually didn't copy one company's product like Siemens or Phillips, but combined all the advantages of different companies and adapted them to their respective products.

The book "The Art of War" emphasizes the importance of subtleties of strategic impressions management for Chinese (Qu and Zhang, 2011). According to Bond (1986) the variety of impressions of others, relationship between audience and identity, counter-aggression and attribution represent the culture with high group responsibility. That is why the strategy should be a key issue to define critical success factors. The point of this article is to describe the impact of culture on the strategic preferences in international markets. Zhang (2002) showed that cultural realism could be described through the history of heroes of Chinese literature where he compares mythological heroes of the history. In his opinion virtue and violence could be ideal instruments of ancient Chinese strategists. In the case of modern times it could be interpreted as a strong spirit and a strong leader. Coming back to another great book in Chinese literature, Sun Tzu, The Art of War (Griffith, 1963) execution of strategy should be more fluid and responded very quickly according to the changing conditions of whole strategic situation. The book describes five elements listed below in Table 1.

**Table 1. Five components of Chinese culture (Kaname and Kuniyuki, 2010)**

<b>Dao</b>	<b>(Moral virtue)</b> The Chinese strategist relies on moral virtue to unite the masses and strengthen the unity and resolve of the military toward a common purpose. The idea of moral virtue comes from the tradition of "Confucian moralism" where a ruler gains the support of his people through benevolent and virtuous conduct.
<b>Zhi</b>	<b>(Foreknowledge)</b> Emphasizes the importance of knowledge and information in strategic planning and decision making. As mentioned above, the scope of this knowledge is broad and encompasses a holistic appreciation for the larger strategic context of a problem or situation. Foreknowledge includes understanding both subjective and objective conditions and how they interact.
<b>Xing</b>	<b>(Dispositions)</b> Disposition or deployment of forces emphasizes placing one's forces in advantageous positions given the existing conditions: the effects of terrain and weather, and, the location of the enemy. The most critical step in deploying one's forces is to first establish an invulnerable defense before seeking an opportunity to conduct an offensive operation.
<b>Bian</b>	<b>(Adaptability)</b> , builds on the other elements described above and involves the transformation from one form or strategy to another in order to adjust to changing conditions.
<b>Shi</b>	<b>(Strategic advantage)</b> is the ability to transform the subjective and objective conditions of a situation to one's favor

Application of these theories with traditional Confucianism and Daoism philosophies can change the whole approach of understanding the success of Chinese companies in the Global market (Deng, 2009).

There are some certain factors which can characterize the approach of Chinese companies (Karim, 2009):

The majority of Chinese enterprises are long-term oriented and not focused on quick returns in profit

Relationships with local agents and managers are very important; market should be developed from deep understanding of every region; focus should be on detailed conditions

Marketing development strategies should be very clear and flexible, according to the historical and cultural issues in the particular country and region

Strategic partnerships are crucial issues, so the companies are very open to direct collaboration with government structures, big hospitals and private investment projects in the healthcare segment.

Focus on knowledge transfer is helpful to develop local partners and create competitive advantages for them, but at the same time it should be carefully shared with detailed understanding of market demand and partners' abilities.

All of the listed points should be re-considered and analyzed during a particular case in a particular country. It is important to emphasize the peculiarity of Chinese strategic factors during the development of new markets, so all of them will be listed below.

### Five Strategic Factors of Chinese culture

Based on interview with top-management of nine Chinese Companies researchers will try to consolidate five elements listed above to one system and characterize the current situation of Chinese companies according to the mode of entry and market developing strategy. All of interviewed people had to fulfil the criteria of being sales or marketing managers with international marketing background at least five years. The response rate of the sample was 58.8; only nine managers among 17 confirmed their schedule and accepted an interview. Semi-structured interview allows adding supplementary questions to get deeper information about content. Specifically the questions were developed to provide detailed information about several factors related to external and internal conditions of company development. Interview has been conducted by the third person with fluent English and Chinese knowledge. Each interview lasted about one hour. The size of sample was very limited, but it could be a basis for further research. In order to protect the identity of interviewed managers researcher used pseudonyms mentioned in Table 2. Detailed information will be available upon request.

**Table 2: List of Interviewed Managers**

Name	Company	Position	Department	Work experience
Director Chen	Mindray	Former Vice-President	International Development Department	41 years
Director Igen	Landwind	General Manager	International Sales and Marketing Department	25 years
Director Tang	Irene/Naton	Regional Sales Director	International Sales and Marketing Department	10 years

Director Yang	Sonoscape	Regional Director	International Sales and Marketing Department	10 years
Director Yang	Aohua	Vice-President	International Sales Department	17 years
Director Lu	Mindray	Marketing Supervisor	International Marketing Department	10 years
Director Liu	Wandong	Regional Sales Director	International Sales Department	11 years
Director Sun	Neusoft	Regional Sales Supervisor	International Sales Department	10 years
Director Song	Comen	Regional Sales Supervisor	International Sales Department	12 years

All the managers listed in the table have been interviewed during the research in four cities: Beijing, Shanghai, Shenzhen, Shenyang.

Companies listed above have been represented by different people with different age and experience, and according to their judgments there are common points between developments of all Chinese companies. Michael Porter (1980) in his work analyzes "Five forces of strategy" mentioned Chinese author Sun Tzu's strategy analysis: "Five Working Fundamentals", but both of them based on strengths and weaknesses analysis. Moral Virtue, Foreknowledge, Dispositions, Adaptability and Strategic advantage could be considered as traditional strategic factors, which has an influence not only on structure of Chinese companies, but even on the development of these companies in the world. Researchers applied those strategic factors to the one of the key points of strategic development of Chinese companies on the world market.

Based on interviews with the top-management of nine Chinese companies (Shenzhen Mindray Bio-Medical Electronics, Shanghai Aohua Medical, Shenyang Neusoft Medical Systems, Naton Medical Group, Shenzhen Comen Medical, Shenzhen Edan Medical, Beijing Aeonmed, Shenzhen Sonoscape) authors consolidated the five elements listed above into one system and characterize the current situation of Chinese companies according to the mode of entry and market developing strategy (Lockett, 1988; Liu, 2004; Lipson and Pemble, 1996). According to the research framework, in-depth discussions during interviews between the researchers of this study and top and middle level managers, who have been regarded as experts and have specific understanding of the success factors of Chinese companies, have shown great results.

## Moral Virtue

Chinese leaders focus on legitimate management, so the most important point is not just to control subordinates, but first the leader must show superior knowledge, hard work and experience, provide guidance and, through these kinds of processes, allow employees to accept the leader, become a teacher in work and in private life (Buckley et al, 2006). Leaders spend time with employees during sports and dinners. Chinese leaders are paying special attention to communication with managers and their subordinates, so the spirit of virtue in the future development of the companies could be fully realized by everybody (Northouse, 2013). The concept of "Building a stable platform for subordinates" is very basic—that is why Mindray (the first Chinese company which started to work on international medical devices market, currently is the biggest manufacturer in China of x-ray, ultrasound, patient support and laboratory equipment) opened a branch in United Kingdom in order to bring their employees the feeling of international spirit and success within the company (Marketline, 2015). According to interview results Edan (patient support system manufacturer) opened its first office in Germany in order to get qualified service engineers and make direct connections with clients through the platform of German manufacturers. All of these examples shows that the moral virtue of the leaders of the company was focused on the development of the inspiration spirit inside the company, so that all employees started to have the feeling that they are not only sell equipment, but participate and improve the healthcare system in every region of the world with best resources.

Another important point is that the level of virtue in Chinese companies has direct relations with the environment in organizations. In China, the majority of people support outstanding leader. Employees in China regard the leader as a hero. So if one focuses on particular company in China there always will be a leader who created and developed the company (Luo and Park, 2001). All these leaders have different characteristics and different management styles, but there is one common point: all of them know how to inspire people. If one will look at Chinese leaders one can find that they are willing to share their vision and experience with employees, like CEO of Alibaba Ma Yun, President of Mindray- Xu Hang, President of Neusoft (biggest MRI and CT manufacturer in China)- Liu Jiren, and the majority of other leaders. Very big focus on the character and virtue of leader of the company makes him become more dependable on subordinates. These leaders basically create the strategy and structure of the company according to their own vision of the social relations in the market. The circle of their relations is not



only based on the circle of people who established the company. Thanks to their communication ability and analysis of information; these leaders have a very strong network of personal relations on every level. Society within the company puts a lot of responsibility on their ability to find the right direction for the company to open new markets (Luo and Park, 2001). Their responsibility is not only limited to traditional ethical forms, but it has a direct connection with the Confucian concept of gentleman. The way these leaders communicate, resolve problems and develop the company has an impact on the corporate culture. So the companies somehow represent the shape of their character, which is totally different from Western society. Even if Chinese companies are internationally oriented the internal structure has principles of Confucian rules. This could be the reason for a specific leadership style in these companies. Moral virtue is a very important point for top-level managers.

### **Foreknowledge**

Foreknowledge is based on two principles: first, extensive experience and the analytical ability of the leaders, and second, a substantial amount of marketing knowledge-information about the political, economic and regional development of local markets is crucial. That is the reason why Chinese managers always use all the instruments available to get knowledge about every market and communicate with everyone. Neusoft (the biggest Chinese MRI and CT manufacturer) encourages their managers to invite to dinner all sales managers from other Chinese companies who are on business trips in local markets. These dinners provide an opportunity to discuss current situations in the market. Mindray and Aeonmed put the responsibility of market analysis on product managers, so they need to gather information and apply it to relevant cases (Meng, 2011). Much of the market information Chinese companies receive is from local associations representing federations of medical doctors in local markets, including Chinese immigrants, government companies and non-government organizations (Lu, 2001). Associations, such as Shenzhen Association of Medical Device Manufacturers and Beijing Medical Devices Association, unite all Chinese companies working with medical devices. All Chinese companies that have factories in Shenzhen area or in Beijing are listed as members. Usually Associations helps to provide certain information about the market, participate in international medical exhibitions and conferences, as well as promote products for small and middle level companies that have very limited budgets and can't spend money on personal marketing activities, like participation in local exhibitions and conferences (Lu, 2001). Chamber of Commerce could be considered as another instrument in promoting Chinese

medical devices; direct cooperation with embassies and local governments help to organize the work of humanitarian and government purchase equipment projects. The level and volume of information is related to the condition of bids. Companies in China require their managers to gather and utilize information about certain regulations and benefits of foreign trade; they are very adaptive to specific financial procedures and cooperation models (Li et al, 2006). The majority of Chinese companies through Sinosure (National Chinese Insurance Company) can provide three to six months, with or without pre-payment, open account conditions, so the customers can pay invoices after three to six months after receipt of products. This could be a reason why they have been succeeding in African, Latin American and Asian regions. The majority of Chinese companies are members of local Chinese associations, like the German-Chinese Association or Mexican-Chinese Trade Union. According to interviewed managers, the common culture and background of sales managers create conditions for them to establish personal relationships, or "Guanxi", with other managers through sharing exclusive information about market perspective and situation. The result of building those relationships has significant influence on the certain projects, so if one Chinese company entered the particular project, after a while, more companies from China will use the same approach in the future (Li et al, 2006).

## **Dispositions**

Sales are considered one of the most important aspects of business. That is why Chinese companies focus on the development of tender management. The majority of Chinese companies' force their employees spend more time in local markets and communicate with end-users, so the image of the product can be better understood by getting feedback from hospitals and doctors (Buckley et al, 2006). According to the interview results, researcher received following information, in 2016, Aohua (China's biggest endoscopy equipment manufacturer), during its development of the Russian market, used an exclusive distributor sales strategy. However, after two years they established a very good customer service network and started to sell equipment with the lowest margin to second-level distributors. Without controlling the profit of second-level distributors, in one year their market share increased two times (Martinsons and Davison, 2006). At the same time, the company developed a personal relationship with Endoscopy Surgeons Association and became the third biggest company on the market in four years, overtaking Japan's Fuji Company. Another important point is that Chinese companies like Wandong (medical imaging equipment manufacturer), Landwind (laboratory and ultrasound equipment producer),

and Mindray, focused on the installation of demo devices in new markets (in most of the cases with an 80 percent discount), so they could create some successful marketing situations and use them as future references. For some government bids with big volume orders, they are willing to sell the products with zero profit or sometimes even with a negative profit to invade the market and create a network of end-user hospitals (Moorman et al, 1993). In order to offer the best solutions Comen, Angel, Anke and Dirui established a strategic alliance, so they could provide very adaptable and personally configured package solutions for turn-key projects with discount and service support for every device from service engineers of each company (Li et al, 2008). So, if one company gets the order, the other three companies will provide full support. These packages are offered for X-ray, laboratory, patient monitors, patient support systems and medical imaging systems.

In order to create an R&D advantage for the company, many Chinese companies began to establish R&D offices abroad (Li et al, 2008), such as Aeonmed with their American offices. Beijing Aeonmed Company opened an American company and created a new brand, Oricare, in the US to position itself as an American manufacturer located in Quakertown, Pennsylvania (Meng, 2014). Neusoft established a new IT department in medical devices and software sectors in cooperation with Northeastern University in China to promote and develop new products (Tan, 2011). Naton-Irene (a high-tech consumables producer for orthopedics) created a platform for communication with orthopedic doctors from all over the world in order to have very convenient way to share their experiences and new protocols in surgical operations. Therefore, the company acquires lots of new ideas helpful in improving their products. Moreover, direct contact with orthopedic doctor federations in different countries helps them to create a good network of reliable specialists, which they started to use when they established a private hospital network company focused on orthopedic surgical operations. On the international market, Naton-Irene company could not change the perception of the quality of Chinese equipment in biodegradable and bioactive implants market, so at the beginning of 2010, the Chinese company purchased the biggest and most popular company on the market-Inion Oy of Finland (Bloomberg, 2010). Thanks to this acquisition, the Chinese company was able to enter the international market, gaining an advantage among competitors and very good product to sell in the Chinese domestic market.

Coming back to Mindray, in order to increase their competitive advantage, they became the first Chinese company representing Medical Devices listed

in Nasdaq (New York SE) in 2006; due to the same reason, they purchased the American company Datascope Inc in 2008. Then they acquired Shenke Medical, Hyssen Electronics, Greenlander Information, and Tiandiren Biotech in 2010 and in 2012 Mindray purchased Dragonbio Surgical Implants and Optcla Medical Instruments. Now, Mindray is represented in four divisions covering 80 percent of the medical devices needed by hospitals. In 2011, in order to get control of sales in the Australian market, Mindray purchased the oldest and only Australian anesthesia manufacturer, ULCO. It then upgraded their sales line with their own products, and gained about 30 percent of market shares in two years. In order to control the market of high-tech consumables like the multi-gas analyzer and capnography modules used in respiratory care equipment, the same company acquired Switzerland's Artema Company and become one of the main suppliers of consumables to their competitors (Frost and Sullivan, 2007).

## **Adaptability**

Chinese companies are very flexible and adaptable; it is very easy for them to change the structure of the company and product according to a certain situation in the market. According to the experience of author for Islamic-oriented countries, many companies change the color of equipment to green - the most suitable color in Islamic culture. In order to support sales needs, Landwind created a strategy department that gathers all the top-managers representing every department (R&D, customer service, sales, marketing, finance, production etc.). If any problem or demand from the customer arises, they can make changes to the product in a very short period of time (Northouse, 2013). Due to the increased speed of the processes in the company in order to support every product department, Aeonmed (anesthesia and ICU ventilator manufacturer) put R&D, production and finance responsibilities together according to product type. This means that anesthesia machines department and ICU ventilator department work like different companies with their own budget and revenue. In order to supply the specific needs of the doctors and make cooperation more convenient, Mindray and Yuyue (rehabilitation equipment producer) started to produce and supply consumables for their own products. Therefore, they have been able to sign long-term contracts directly with hospitals. Another important point is that according to the particular situation in the market, they can work using distribution sales development, direct government bids participation and direct sales (Meng, 2014).

When e-commerce started to grow in China, medical device companies were among first to promote their products on the platform of Alibaba.

Issues with customer service were resolved through local service centers. Because the cost of these centers was high, companies lowered costs through the strategic alliance platforms mentioned previously. Currently, the e-commerce platform for medical devices is one of the most profitable.

The work of Meng (2014) showed that in order to be adaptive to the needs and perceptions of customers, Chinese companies, with very short histories, started to use the strategy of cooperation with the world's biggest players. The best example of this alliance is between Beijing Aeonmed and a German company with more than 100 hundred years of anesthesia production experience. When some parts of the product are assembled abroad, devices are produced under a different brand name and country of origin.

### **Strategic Advantage**

Chinese companies created strategic advantages by opening representative offices near to key customer businesses, so if any problems or questions with the products or order comes out, customers only needed to knock the nearby door.

In developing countries, increasing populations put a pressure on governments to adopt cost-cutting reforms in the healthcare sector and reduce the purchasing price of medical equipment with keeping quality of the products. Chinese companies have shown great results in this field. Since 2004, Mindray has set up about 20 overseas sales offices with customer service support centers. That approach helped them understand local market demand and customer requirements. And this also provided better local services, which increased brand stability in the market (Tan, 2011). In order to gain the advantage in African and Middle-Eastern markets, Neusoft and Yuyue companies opened a hub in Dubai where they can keep products, spare parts and consumables; so in 72 hours they can deliver a certain product in every part of Africa (Sigurdson, 2008). In looking at the sales strategy of Aeonmed, an observer will find that this company has been providing a communication platform for the specialists and doctors who have been using their equipment. The company created an international network among doctors who have been using their anesthesia machines. These local associations provided practice exchange and knowledge sharing programs for doctors in different countries, mainly in China (Meng, 2014).

What is interesting is that a lot of companies in China working in medical devices are very open to original equipment manufacturer (OEM) cooperation- is the type of cooperation when one company produces parts or equipment with the label of another company; it means that they are not

really focused on the brand building process, but on manufacturing scale. Chinese companies currently are the biggest OEM supplier in the world. Through use of OEM development strategy companies can avoid many of the expenses for promotion and marketing activities. Consequently, they can afford high scale production, which will be helpful for reducing the cost of equipment produced with their brand (Tan, 2011). Moreover, through cooperation with highly experienced and professional companies, Chinese companies increase their level of experience and market promotion instruments. Deng Xiaoping, the leaders of the Chinese Communist Party interpreted the whole Chinese philosophy in one phrase: "It doesn't matter if a cat is black or white, so long as it catches mice" (Moak & Lee, 2015). The majority of companies are using the sales network and brand name of another company to establish their own sales network and increase the production volume of their own products. Thanks to this strategy, Chinese companies don't need to create big marketing departments.

## Conclusion

Based on interviews with top and middle level managers, the researchers attempted to express the key strategic points of traditional culture through the marketing development. This paper describes the relationship between traditional points of strategical points mentioned in the book of Sun Tzu-"The Art of War" and the particular approach of Chinese companies during the development of international markets. The idea was to focus on certain cases and describe it from the point of view of managers who are working in these companies. Those strategic points and approach have been compared and analyzed together. Basically, the cultural background has more influence on societies than individuals think. That could be one of the reasons why Chinese companies are more successful in the global market than Indian or other Asian companies.

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## A Comparative Study on Readability Levels of Annual Reports and Banks' Performance

Neetika Jain<sup>1</sup> and Simranjeet Kaur Sandhar<sup>2</sup>

### *Abstract*

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*Readability refers to the relative ease in which a written passage of text can be read and understood by others. Numerous mathematical formulas have been developed to support writers in computing the readability of their script. The research work is an initiative to test the relationship of readability levels of annual reports of banking sector with their performance figures. If disclosure readability is strategically used by managers to hide adverse information, a relationship between firm performance and readability would be expected. So it is essential to study the readability scores of annual reports and to verify its relation with some of the important parameters which can make significant change in their readability scores. The study covers the annual reports of banking sector in India and compares the readability scores of these reports on the basis of independent variable i.e. profitability. Almost all the Indian commercial banks are covered and the sample of annual reports collected is 88. The study considered the annual reports of Indian commercial banks for 3 years from 2009 to 2012. Furthermore, 6 hypotheses are constructed to observe the relationship between the readability of annual reports and profitability levels of banks. The results propose that banks with good or bad financial results do not show their outcome on readability of annual report. Therefore if the disclosures of the Company are more concise and syntactically simple, it does not indicate that the firm's performance was good.*

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**Keywords:** *Readability, Profitability, Annual Reports*

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## Introduction

### Understanding Readability

Readability is what that explains some texts are easier to read than others. It is often puzzled with legibility, which concerns style and layout.

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Readability talks about the ease with which a text can be read. Numerous mathematical formulas have been developed to support writers in computing the readability of their script. Most authors in their formulas (indexes) include sentence length and a few measure of syllabic intensity as major components. Other aspects, such as sentence structure, graphic presentation, and font types may influence readability; yet, these are very subjective in character and really complex to measure.

Accepted readability indexes comprise the Flesch Readability Formula, Given by Rudolf Flesch; the Fry Readability Graph, formed by Edward Fry; and the Gunning Fog Index, created by Robert Gunning (Lewis & Adams, 2001).

George Klare (1963) describes readability as "the ease of understanding or comprehension due to the approach of writing." This definition is based on writing style as taken apart from issues such as content, logic, and organization. Similarly, Gretchen Hargis and her colleagues at IBM (1998) acknowledged that readability, the "ease of reading words and sentences," is a trait of simplicity.

The inventor of the SMOG readability formula G. Harry McLaughlin (1969) describes readability as: "the extent to which a specified class of public find certain reading material convincing and understandable." This definition focuses the communication between the text and a class of readers of known character such as reading skill, prior knowledge, & motivation.

Edgar Dale and Jeanne Chail's (1949) definition may be the most inclusive: "The sum (including all the interactions) of all those basics within a known portion of printed material that influence the success a group of readers have with it. The success is the level to which readers understand it, read it at a best possible speed, and find it appealing."

## **Readability Formulas**

Developments and research on the formulas remain undisclosed until 1950s. Authors like Rudolf Flesch, George Klare, Edgar Dale, and Jeanne Chall developed the formulas and the research supporting them and their application. The formulas were largely used in journalism, research, health care, law, insurance, and manufacturing industry.

During 1980s, there were 200 formulas and about a thousand studies published on the readability formulas confirming their strong theoretical and statistical legality. Research in due course established that the two factors commonly used in readability formulas—a semantic (meaning)

variable such as difficulty of vocabulary and a syntactic (sentence structure) variable such as average sentence length-are the best interpreter of textual difficulty. (DuBay, 2004).

The Flesch readability formula is the most accepted measure for reviewing textual difficulty (Clatworthy & Jones, 2001). This formula, devised in 1948, has received criticism for the reason that it has a narrow focus and differing use of language. Despite of the limits, the Flesch readability formula offers an objective evaluation of reading ease (Subramanian et al., 1993).

Fog Index from computational linguistics is based on syntactical textual traits (like words per sentence and syllables per word). The intuition of using fog index is that, other things being equal, more syllables per word or more words per sentence make a text harder to read. Developed by Robert Gunning, the formula is an acknowledged and simple parameter for assessing readability. After assuming that the script is well formed and logical, it confines text difficulty level as a function of syllables per word and words per sentence.

Following is the list of some of the readability scores measured in this study which are explained further in the study under the heading of research methodology:

1. Flesch Kincaid Reading Ease
2. Flesch Kincaid Grade Level
3. Gunning Fog Index
4. SMOG Score
5. Coleman Liau Index
6. Automated Readability Index

### **Annual Report: A Disclosure**

The corporate annual report contains gathered corporate information about growth and events that occurred during the reporting year in a complete and condensed manner, which are formed on a regular basis and offers an opportunity for a comparative analysis of organization attitudes and policies across reporting periods (Niemark, 1995). It is normally perceived to be the most important business report for company evaluation. It provides opportunities for firms to increase their communication with investors and the financial group of people in general by going further than the reporting of merely financial information (Cameron and Guthrie, 1993). Marston and Shrives (1991) concluded that the annual report is the broadest document

available to the public and is therefore the main disclosure medium. Parker (1982) highlighted the significance of annual reports as a mass communicate medium, which emphasizing its broad coverage and availability. It is also supposed to be the main external reporting vehicle for information announcement (Johanson et al., 1999). For these reasons, the corporate annual report is chosen for the purpose of this research.

### **Relevance of Readability in Corporate Disclosures**

Corporate annual reports are widely acknowledged as tools used by companies to facilitate communication with investors and other stakeholders. Annual reports are viewed as authoritative and legitimate documents, yet they are ones in which editorial control remains with those responsible for their preparation (Neu et al. 1998)

Readability of annual reports is naturally a topical area. These documents represent the primary source of information for investors and analysts for decision-making purposes. As such it is important that users are able to understand and comprehend the information contained within a company's annual report. The annual reports can either be a good news communication highlighting superior corporate performance or a bad news communication relating sub-par financial results or corporate actions. Firms that veil negative information are missing an opportunity to gain trust and confidence (Subramanian et al., 1993).

There are three significant elements of corporate disclosure: content (what), timing (when) and presentation (how) (Courtis, 2004), the worth of these three, is based upon their readability and understandability. Firms may influence the content and appearance of information in various ways, fundamentally using what is called as 'impression management' (Godfrey *et al.*, 2003). Using the above practice, companies can manipulate oral information by the reading ease manipulation (e.g., to make the text difficult to read) or by the rhetorical manipulation method/practice (e.g., using persuasive language).

However, existing studies suggest that readability of annual reports can be manipulated based on the type of information being conveyed. For example, Subramanian, Insley, and Blackwell (1993) found that annual reports for companies with good performance were easier to read (requiring a 10<sup>th</sup> grade level to read) than those with poor performance (requiring at least a 14<sup>th</sup> grade level or a college education). Furthermore, in their analysis of annual reports, Straw, McKechnie, and Puffer (1983) found that managers took credit for good news and blamed the environment for bad news.

The research study on the readability of annual reports of Indian companies in connection with financial performance is found to be meager. The present research work is an initiative to test the relationship of readability levels of annual reports of banking sector with their performance figures. Hence this study may reveal whether corporate communication in the form of annual reports could reduce information asymmetry or not. If disclosure readability is strategically used by managers to hide adverse information, a relationship between firm performance and readability would be expected. There are many prior studies investigating the relationship between the readability of the corporate narrative and firm performance, and hence this study is motivated to test some of hypotheses that have been developed in this respect. The variable that represents the firm's financial performance is profitability. So it is essential to study the readability scores of annual reports and to verify its relation with some of the important parameters which can make significant change in their readability scores. The study covers the annual reports of banking sector in India and compares the readability scores of these reports on the basis of above mentioned independent variables.

## **Review of Literature**

Companies as well as the regulatory bodies are making efforts to increase the usefulness or the readability in particular, of the annual reports. Despite such efforts by the companies and the regulatory authorities, and the recent progress in business communication, there is still much uninformative, unimaginative reporting of company activities. One reason is that those who are preparing the annual report for the company may not be the best judges of clarity and readability. Another reason is that it is the nature of financial reporting to score in the lower third of the readability scale (Wheeler, 2006). Management's intention to make the report harder can also be a very good reason. Given the importance of the plain English disclosure regulation, surprisingly, there is little large sample empirical evidence on its relevance. Following are review of several studies done on the readability and its relevance on corporate annual report.

Healy et al. (1999) reported that firms voluntarily increase their disclosure levels experiences significant increases in their stock prices beyond what can be explained by contemporary earnings performance. It also studies the reading ease of the footnotes to the financial statements of 50 New Zealand firms. Gelb and Zarowin (2000) compared firms with high disclosure ratings versus low disclosure ratings and conclude that the former experience a more significant stock price association to current and future earnings

reports, consistent with more credibility behind those disclosures. Kothari et al. (2008) used content analysis to show that positive disclosures reduce firm risk along multiple dimensions, including the cost of equity capital, volatility of a firm's stock returns, and the dispersion of analyst forecast estimates.

Riedl and Srinivasan (2006) found that managers exercise strategic discretion in their reporting of special items, giving explicit income statement recognition of transitory disruptions in expected profitability, while relegating explanation of more persistent earnings shocks to the financial statement footnotes.

Clatworthy and Jones (2001) stated that the most common tool utilised in readability studies to assess the syntactical complexity of narratives has been the Flesch readability formula. In a calculation that considers the number of syllables per word and the number of words per sentence, the Flesch formula produces a score that can be aligned with reading difficulty. The lower the score, the harder the narrative passage is to read. For example, scores of 70 or more are considered to be fairly easy to read. Scores between 30 and 50 are rated as difficult while those of 30 or less are considered to be very difficult, and likely to be understood only by those with a tertiary education. The use of Flesch scores as a measure of the readability of annual report narratives has been criticised by several authors. But he argued that the use of the Flesch formula is justifiable because it allows for easily computable results, understandability, and comparability with previous studies. Further evidence that firms strategically manage the information content of their corporate disclosures is found in the literature on earnings release timing. Early work in this area suggests firms exhibit a proclivity to announce good news early, and delay the release of bad news as long as possible in an effort to maximize shareholder wealth. For example, Lurie and Pastena (1975) found 59 percent of "good news" disclosures are made during the first six-months of a fiscal year, while only 22 percent of "bad news" disclosures are made during this same interval. More strikingly, they also find 38 percent of all "bad news" filings occur during the final month of a firm's fiscal year. Similarly, Kross and Schroeder (1984) found early releases of quarterly earnings announcements are characterized by better news than late announcements, while Chai and Tung (2003) found late reporters exhibit lower profitability and are characterized by more negative discretionary accruals than their early reporting counterparts. Finally, both Patel and Wolfson (1982) and Damodaran (1989) reported firm's time of release of negative information to minimize market impacts. Specifically, Patel and Wolfson (1982) found good news is likely to be released when

markets are open, while bad news is disproportionately released after the market closes. Although relatively few earnings announcements are made on Fridays, those that are tend to be made after-the close. Consistent with minimizing negative announcement effects, Damodaran (1989) found Friday announcements are disproportionately negative, and associated with lower (more negative) abnormal returns.

Without any appeal to the existence of asymmetric information among traders, a similar conclusion is arrived at by Lambert et al. (2007). They demonstrated that increasing the quality of accounting disclosures decreases a firm's cost of capital through a lowering of the expected covariance of returns between the firm and the market. Summarizing the intuition underlying this result, at the information limit (no information uncertainty exists whatsoever and the cash flow distribution is perfectly revealed), the covariance of returns with the market ceases to be priced as a risk factor because the market provides no additional information concerning the firm's cash flows.

Jones and Shoemaker (1994) reviewed 32 studies in the fields of accounting, business communication and management and studied the readability of annual report narratives (26 studies), tax law (3 studies) and accounting textbook (3 studies). They conclude that most of the studies try to assess the reading ease of the annual report and its components. The authors further conclude that the previous studies have consistently shown that narratives in corporate reports are difficult or very difficult to read.

Richards and Staden (2001) hypothesized that the introduction of International Financial Reporting Standards in New Zealand could lead to increased difficulty in reading the resulting financial statements. Using a range of readability indicators (Flesh, Flesh-Kincaid, Smog and Fog) their results showed that the readability of financial statements decreases after IFRS adoption. This was confirmed by other proxies for reading difficulty (statement length and number of tables) and therefore their results support our hypothesis. The results hold even after exerting statistical control over the other variables that previous research had identified as significantly related to financial disclosures readability (size, leverage, volatility and industry). They have found sufficient evidence to reject the null hypotheses and conclude that they have found sufficient evidence to conclude that the adoption of IFRS has led to more complicated annual report disclosures. These relationships revealed a troubling situation, adoption of NZIFRS has deteriorated the readability of annual report disclosures and resulted in considerably longer and more complicated reports. While the direct cause



of this relationship is not investigated in this research work, it is evident that work is required to remedy this result of NZIFRS adoption. This research work, found the readability of annual reports notes to be very poor with scores suggesting at least a Bachelor's Degree is required to comprehend their content.

According to White and Hanson (2002), the annual reports are viewed as authoritative and legitimate documents, yet they are ones in which editorial control remains with those responsible for their preparation. The readability of narrative disclosures in the corporate annual reports of listed companies has been extensively researched. Narrative disclosures have consistently been found to be difficult for users to read and comprehend. Due to the differences in both the nature of the operations and in the potential report users of local governments and listed companies, a comparison of their reporting styles is interesting. Inter alia, local governments provide services and impose regulations that affect all residents in their jurisdictions. Unlike customers or shareholders of a listed company, residents cannot 'opt out' of their relationship with their local government. Thus local governments have the challenge of communicating to a user group that may differ in motivation and sophistication in comparison to the users of corporate annual reports. The decision to include voluntary narratives in the local government reports suggests that the preparers intend the report to be used to communicate with the readers and not simply to fulfill a statutory role. Because users of local government annual reports are different from the major users of corporate annual reports, typically those with a financial interest in the corporation, they may be making and evaluating types of decisions that differ from the investment and analysis-type decisions generally made by corporate report readers.

Lewis, Colvard and Adams (2008) determined the readability of privacy policies of banks, check cashing companies, and credit counseling companies. Privacy policies of the three business types were tested using the Flesch-Kincaid Grade Level test. Findings revealed that most privacy policies were written easily. Support for an association between disclosure efficacy and cost of capital is also provided by a large number of empirical studies. For example, Botosan (1997) found that firms relatively neglected by the analyst community exhibit a significant negative relation between voluntary disclosure levels and the implied cost of capital.

The above literature portrays a convincing association between disclosure efficacy (both quality and quantity) and annual report readability levels. The present study tests whether the readability of financial reports is empirically associated with banks' performance after controlling for other "non-

experimental" sources of readability variation. In addition, the study should be viewed as a meaningful step forward towards a fuller understanding of the linkages between basis of comparison and readability levels of annual reports.

## Objectives of the Study

- To analyze the applicability of readability scores on corporate annual reports.
- To determine the readability measures of the annual reports of Indian commercial banks.
- To compare the readability score of annual reports of commercial banks on the basis of bank's profitability.

## Research Methodology

### Research Design

This study is about readability of annual reports of banks, thus these documents represent the primary source of information for investors and analysts for decision-making purposes. As such, it is important that readers are able to understand and comprehend the information contained within a company's annual report. While it is our opinion that the use of readability formulas in accounting has stood the test of time, there is still considerable debate over the general applicability of readability formulas in the accounting context.

The sample consists of 20 Public sector banks and 15 private sector banks and 88 annual reports of three years, i.e. from 2009 to 2012 were taken for the study. Table 1 and Table 2 shows the details of the selected commercial banks.

**Table 1. Details of Selected Public Sector Banks**

Particulars	Public Sector Banks
Banks	20
No. of Years	3
Total Annual Reports (20*3)	<b>60</b>
Andhra Bank (Not available of all three years)	3
Corporation Bank (Unedited of 2012)	1
Dena Bank ( Unedited for 2011)	1

Indian Bank (Unedited for 2012)	1
Indian Overseas bank (Unedited for 2012)	1
Oriental Bank of Commerce (Not available for 2011 & 2012)	2
Punjab & Sind Bank (Unedited for 2012)	1
UCO Bank (Not available for 2012)	1
Vijaya Bank (Not available for all years)	3
<b>Total Annual Reports</b>	<b>46</b>
<b>1. Size</b>	<b>23</b>
1.1 Smaller in size	
1.2 Bigger in Size	23
<b>2. Leverage</b>	
2.1 More Levered	23
2.2 Less Levered	?
<b>3. Return on Assets</b>	<b>23</b>
3.1 Higher return on assets	
3.2 Lower return on assets	23
<b>4. Profitability</b>	
4.1 Higher profitability	23
4.2 Lower profitability	23
<b>5. Liquidity</b>	<b>23</b>
5.1 Higher Liquidity	
5.2 Lower Liquidity	23

**Table 2. Details of Selected Private Sector Banks**

Particulars	Private Sector Bank
Banks	<b>15</b>
No. of Years	<b>3</b>
Total Annual reports	<b>45</b>
Catholic Syrian Bank (Not available for 2010)	1
Karur Vyasya Bank (Unedited for 2010)	1
Karnataka Bank (Unedited for 2012)	1
<b>Total Annual Reports</b>	<b>42</b>
<b>1. Size</b>	
1.1 Smaller in size	
1.2 Bigger in Size	21
	21

2.	Leverage	
2.1	More Levered	21
2.2	Less Levered	21
		21
3.	Return on Assets	
3.1	Higher return on assets	21
3.2	Lower return on assets	21
		21
4.	Profitability	
4.1	Higher profitability	21
4.2	Lower profitability	21
		21
5.	Liquidity	
5.1	Higher Liquidity	21
5.2	Lower Liquidity	21
		21

## Data Collection Method

The annual reports for three years of all the banks taken up as sample were downloaded from the respective websites of commercial bank. The annual reports downloaded were available in Pdf format. All non financial information from these annual reports was downloaded. Non Financial information includes Message from CEO, Director's Report, Management Discussion & Analysis, and Schedules containing non financial information, Auditor's Report on Consolidated financial statements & Basel 111 Disclosures. All the heading items, paragraphs that have less than one line & tables were deleted. It is important to delete the tables and financial statements, since the readability indices are designed for text rather than numbers or tables. To determine the proper software to calculate readability score we initially started working with MS Word's tool. Later we took help from a website i.e. Test Document Readability (<http://www.readability.info/>) to analyze the characteristics of the annual reports, which ascertains a multitude of readability scores, such as Kincaid, Automated Readability Index (ARI), Coleman-Liau, Flesch Index, Gunning FOG Index, and Simple Measure of Gobbledygook (SMOG) Grading. We have found large deviations between the results generated by MS Word and that of the website. Then we have randomly selected some part of annual reports and computed Flesch Reading Ease Score manually and found the computed results of the website more accurate. Finally, we decided to use the statistics provided by the website.

## Dependent Variables

Of a number of readability score methodologies, we have empirically measured readability of annual reports using the following variables:

### Flesch Reading Ease Formula

The first variable is the Flesch Reading Ease (such as the average number of syllables per 100 words and the average sentence-length) in the annual report. The idea is that, everything else equal, more syllables per word or more words per sentence make a document harder to read and understand. The higher the Flesch Reading Ease, the easier is the text. In this study, the Flesch Readability score was used as a readability measurement of the corporate disclosure, since the formula takes these two important variables into account (Flesch, 1960). Therefore, the readability score is represented by the formula is as follows:

$$\text{Readability Score} = 206.835 - 1.01\text{SSL} - 0.846\text{WL}$$

where:

SL= Average sentence length (Number of words/number of sentence)

WL = Average Word Length (Number of syllables/100 words)

This formula was chosen for the following reasons. First, it is the most widely used technique in previous readability studies (Courtis, 1986; 1998; 2004; Schroeder and Gibson, 1990; 1992; Smith and Taffler, 1992a; Subramanian *et al.*, 1993; Smith *et al.*, 2006). Secondly, due to the fact that it is a widely accepted method, it is possible to compare the findings with prior studies. Thirdly, the formula generates a readability score on a scale ranging from 0 to 100. The higher the point scale, the easier to read the text and the lower the point scale, the greater the difficulty in reading.

In the 'Art of Readable Writing', Flesch (1949) described his Reading Ease Scales are presented in Table 3.

**Table 3. Flesch Reading Ease scales**

Reading Ease Score	Style Description	Estimated Reading Grade
0 to 30:	Very Difficult	College graduate
30 to 40:	Difficult	13th to 16th grade
50 to 60:	Fairly Difficult	10th to 12th grade
60 to 70:	Standard	8th and 9th grade
70 to 80:	Fairly Easy	7th grade
80 to 90:	Easy	6th grade
90 to 100:	Very Easy	5th grade

Flesch's Reading Ease formula became the most widely used formula and one of the most tested and reliable (Klare 1963). It is wide spread, especially in the USA, because of good results and simple computation. Standard English documents averages approximately 60 to 70.

## Kincaid Formula

The Kincaid Formula has been developed for Navy training manuals, which ranged in difficulty from 5.5 to 16.3. It is probably best applied to technical documents, because it is based on adult training manuals rather than school book text. Dialogs (often found in fictional texts) are usually a series of short sentences, which lowers the score. Flesch Reading Ease formula simplified and converted to grade level (now known as the Flesch-Kincaid readability formula):

Flesch Formula =  $(11.8 * \text{syllables per word}) + (0.39 * \text{words per sentence}) - 15.59$ , rates text on U.S. grade school level.

## Fog Index

Similar to Li (2008), we measure the readability of annual reports using the Fog Index. This index, developed in the computational linguistics literature, captures the written complexity of a document as a function of the number of syllables per word and the number of words per sentence. Specifically, we calculate the readability of the annual reports for firm  $i$  in year  $t$  as follows:

Grade level =  $3.0680 + .0877 (\text{average sentence length}) + .0984 (\text{percentage of monosyllables})$ .

Fog Count new:  $GL = \frac{(\text{easy words} + 3 (\text{hard words}))}{(\text{sentences})} - 3$

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where:

Easy words= number of number of 1 and 2-syllable words per 100 words

Hard words= number of words of more than 2 syllables per 100 words

Sentences= number of sentences per 100 words

A complex word is defined as one with three or more syllables. The index is interpreted as the number of years of formal education required for a person of average intelligence to read the document once and understand it. The formula is objective and simple to calculate. It allows us to study the disclosure characteristics of a large and diverse group of firms and does not depend on analyst surveys or opinions. It also provides us with

a comprehensive measure of the overall syntactic complexity of annual reports as opposed to the complexity of individual financial items.

The relation between Fog and reading ease is as follows:  $FOG \geq 18$  means the text is unreadable; 14-18 (difficult); 12-14 (ideal); 10-12 (acceptable); and 8-10 (childish).

However, for the purpose of completeness, other indicators to measure the concept of readability are put forward and included for investigation.

### **Automated Readability Index**

The Automated Readability Index is typically higher than Kincaid and Coleman-Liau, but lower than Flesch.

$$ARI = 4.71 * \text{chars/wds} + 0.5 * \text{wds/sentences} - 21.43$$

Smith and Kincaid (1970)<sup>3</sup> successfully validated the ARI on technical materials in both manual and computer modes.

### **Coleman-Liau Formula**

The Coleman-Liau Formula usually gives a lower grade than Kincaid, ARI and Flesch when applied to technical documents.

$$\text{Coleman-Liau} = 5.89 * \text{chars/wds} - 0.3 * \text{sentences}/(100 * \text{wds}) - 15.8$$

### **Smog-Grading**

The SMOG-Grading for English texts has been developed by McLaughlin in 1969. Its result is a school grade. SMOG formula is in the belief that the word length and sentence length should be multiplied rather than added. By counting the number of words of more than two syllables (polysyllable count) in 30 sentences, he provides this simple formula:

$$\text{SMOG-Grading} = \text{square root of } (((\text{wds} \geq 3 \text{ syll})/\text{sent}) * 30) + 3$$

McLaughlin validated his formula against the McCall-Crabbs passages. He used a 100 percent correct-score criterion. As a result, his formula generally predicts scores at least two grades higher than the Dale-Chall formula.

<sup>3</sup> Smith, E. A. & Kincaid, J. P. (1970). "Derivation and validation of the automated readability index for use with technical materials." *Human factors* 12:457-464.

## Independent Variables

**Profitability:** If disclosure readability is strategically used by managers to hide adverse information, a relationship between firm performance and readability would be expected. This management opportunism story argues that managers have incentives to obfuscate information when the current performance is bad (Bloomfield (2002). In particular, it has to be examined whether the positive earnings affirms with more complex annual reports are less persistent and whether the negative earnings of these firms are more persistent in the next several years. Firms with more complicated annual reports have a lower persistence of earnings when they are profitable. The effect can be significant both economically and statistically. However, this hypothesized relation between disclosure readability and a firm's current performance may not be significant. First, corporate annual reports contain a lot of financial information about current and historical performance. Hence, the benefit to the managers of making the annual reports harder to read in order to hide adverse information about current performance seems small. Second, if the good current earnings are (partially) due to strategic manipulation, then managers may not necessarily want to make the annual reports easier to read when the reported earnings is "good". The earnings are defined as EBIT/Total Assets.

## Hypothesis

1.  $H_{01}$ : There is no significant difference of profitability on the Flesch Kincaid Reading Ease score of annual reports of public sector banks and private sector banks.
2.  $H_{02}$ : There is no significant difference of profitability on the Flesch Kincaid Grade Level score of annual reports of public sector banks and private sector banks.
3.  $H_{03}$ : There is no significant difference of profitability on the Gunning Fog score of annual reports of public sector banks and private sector banks.
4.  $H_{04}$ : There is no significant difference of profitability on the SMOG Index score of annual reports of public sector banks and private sector banks.
5.  $H_{05}$ : There is no significant difference of profitability on the Coleman Liau Index score of annual reports of public sector banks and private sector banks.



6.  $H_{06}$ : There is no significant difference of profitability on the Automated Readability Index score of annual reports of public sector banks and private sector banks.

## Tools for Data Analysis

### Independent Sample t-test

The Independent-Samples T Test procedure tests the significance of the difference between two sample means. Also it displays descriptive statistics for each test variable, A test of variance equality, A confidence interval for the difference between the two variables (95 percent or a value you specify). Usually, the groups in a two-sample t test are fixed by design, and the grouping variable has one value for each group. With the Independent sample t test procedure, the need is to provide the cut point. The program divides the sample in two at the cut point and performs the t test. The virtue of this method is that the cut point can easily be changed without the need to re-create the grouping variable by hand every time.

## Results & Interpretations

### Comparison of Readability & Understandability of Annual Reports on the basis of Profitability

**Table 4. Descriptive Statistics for Flesch Kincaid Reading Ease**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability $\geq$ .01	23	42.1730	4.92358	1.02664
	Profitability $<$ .01	23	41.2939	5.37219	1.12018
Private Sector Banks	Profitability $\geq$ .01	21	36.2995	5.78664	1.26275
	Profitability $<$ .01	21	38.4162	3.76877	.82241

The above table shows the descriptive statistics of the Flesch Kincaid reading Ease, which has been divided in two groups on the basis of median of profitability of banks. The two groups are named as banks with higher profitability and banks with lower profitability. The table depicts that the mean of both the group of public sector banks with more profitability or less profitability are 42.1730 and 41.2939 with standard deviation of 4.92358 and 5.37219 respectively. For private sector banks two groups of higher profitability and lower profitability on the basis of the median calculated i.e. 0.01173. The mean of both the groups is 36.2995 and 38.4162 with standard deviation of 5.79 and 3.77 respectively. The mean scores of readability of both the groups do not have much variation. Also the values of

standard deviation are low which concludes that there is not much variation in readability scores of annual reports of banks taken into consideration. Hence the annual reports of public sector banks are more readable than private sector banks.

**Table 5. Descriptive Statistics for Flesch Kincaid Grade level**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability $\geq$ .01	23	11.1852	1.25743	.26219
	Profitability $<$ .01	23	11.5487	1.39224	.29030
Private Sector Banks	Profitability $\geq$ .01	21	12.8976	1.57076	.34277
	Profitability $<$ .01	21	12.2586	.96257	.21005

The above table for the descriptive statistics shows that the mean of scores of readability calculated by Flesch Kincaid Grade Level and the standard deviation are 11.19 & 1.26 for the public sector banks with higher profitability respectively. For the public sector banks with lower profitability the mean of scores and standard deviation are 11.55 & 1.39 respectively. The mean scores of readability levels as calculated by Kincaid formula of private sector banks for two groups are 12.90 and 12.26 which are very close to each other. The values of standard deviation of both the groups are also very less. Hence it can be said that readability scores of banks of both the groups are almost same and does not show much variation. Annual reports of private sector banks are comparatively easier than public sector banks.

**Table 6. Descriptive Statistics for Gunning Fog Index**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability $\geq$ .01	23	13.3387	1.31799	.27482
	Profitability $<$ .01	23	13.7078	1.35582	.28271
Private Sector Banks	Profitability $\geq$ .01	21	14.9824	1.64903	.35985
	Profitability $<$ .01	21	14.3710	.97897	.21363

The descriptive statistics table shows the means of scores and standard deviation of the readability scores of annual reports of banks of public sector & private sector as per the Gunning Fog Index. In case of public sector banks the mean and standard deviation of scores of both the groups does not vary too much. In case of private sector banks the values of means are 14.98 & 14.37 for both the groups. Also the standard deviation for both the groups is 1.65 & 0.98. The values of means are close to each other and of

standard deviation are very less. Thus it can be depicted that profitability levels do not show much difference on the readability levels of the banks belonging to different groups. Public sector banks show easier annual reports in comparison to private sector banks.

**Table 7. Descriptive Statistics for SMOG Index**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability>= .01	23	13.3417	1.03327	.21545
	Profitability< .01	23	13.6409	1.02558	.21385
Private Sector Banks	Profitability>= .01	21	14.6962	1.20444	.26283
	Profitability< .01	21	14.2162	.76675	.16732

Descriptive statistics in Table 7 shows the mean scores and standard deviation of the readability scores calculated through SMOG Index. The values of means for both the groups i.e. public sector banks with higher profitability and with lower profitability are 13.34 & 13.64 respectively. Similarly standard deviation for both the groups is 1.03 & 1.025. In case of private sector banks the mean values are 14.70 & 14.22 for the two groups divided on the basis of profitability and the values of the standard deviation are 1.20 and .77. These values too depicts that the readability scores does not show much variation and also the value of standard deviation is too low. The public sector banks are easier to read and understand in comparison to private sector banks.

**Table 8. Descriptive Statistics for Coleman Liau Index**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability>= .01	23	12.0952	.90898	.18954
	Profitability< .01	23	12.2291	.85543	.17837
Private Sector Banks	Profitability>= .01	21	12.9762	1.07411	.23439
	Profitability< .01	21	12.7019	.64153	.13999

The descriptive statistics in table 8 shows the mean values and standard deviation values of the readability scores of annual reports of public sector & private sector banks calculated by Coleman Liau Index. In case of public sector banks the mean values for both the groups i.e. banks with higher profitability and banks with lower profitability are 12.91 & 12.22. The values of mean do not show much variation. The table shows private sector bank's mean values of both the groups made for the analysis are not far off and

are very close to each other. Also the smaller values of standard deviation signify that readability scores are in the same range irrespective of their profitability levels.

**Table 9. Descriptive Statistics for Automated Readability Index**

Sector	Variable	N	Mean	Std. Deviation	Std. Error Mean
Public Sector Banks	Profitability $\geq$ .01	23	10.1443	1.63932	.34182
	Profitability $<$ .01	23	10.6357	1.77812	.37076
Private Sector Banks	Profitability $\geq$ .01	21	12.3486	2.15642	.47057
	Profitability $<$ .01	21	11.5181	1.28275	.27992

The descriptive statistics in table 9 shows that the means of two groups of public sector banks are found to be 10.14 and 10.64. Also the values of the standard deviation are very less. Similar in private sector banks the closer values of means of Automated Readability Index depicts that the readability scores of banks are close to each other and also smaller values of standard deviation signify that the readability scores of the annual reports of banks taken for sample does not move far from their mean values. The public sector bank's annual reports are comparatively easier to read and understand.

**Table 10. Profitability & Readability Formulas**

S.No	Categories	Hypothesis for No Significant Difference	Accepted/ Rejected
1	Profitability & Flesch Kincaid Reading Ease	H <sub>01</sub>	Accepted
2	Profitability & Flesch Kincaid Grade Level	H <sub>02</sub>	Accepted
3	Profitability & Gunning Fog Index	H <sub>03</sub>	Accepted
4	Profitability & SMOG Index	H <sub>04</sub>	Accepted
5	Profitability & Coleman Liau Index	H <sub>05</sub>	Accepted
6	Profitability & ARI	H <sub>06</sub>	Accepted

- **Flesch Kincaid Reading Ease** - The null hypothesis (H<sub>0</sub>) is accepted and no significant difference of profitability levels of banks on the readability levels of their annual reports. So the banks may earn

more profit or less profit but it will make annual reports easier or harder to read.

- **Flesch Kincaid Grade Level** - The null hypothesis ( $H_0$ ) is accepted, implying readability scores of annual reports calculated by Flesch Kincaid Grade Level do not have any effect on the profitability levels of banks.
- **Gunning Fog Index** - For Gunning Fog Index, the null hypothesis ( $H_{03}$ ) is accepted. The banks earning more profit or less profit do not generate easier or harder annual reports.
- **SMOG Index** -The acceptance of null hypotheses ( $H_{04}$ ) concludes that profitability levels of banks do not make annual reports easier or harder to read and understand.
- **Coleman Liau Index** -The acceptance of null hypothesis ( $H_{05}$ ) concludes that annual reports cannot be said to be easy or hard if it has higher or lower readability levels.
- **Automated Readability Index** - For ARI, the null hypothesis ( $H_{06}$ ) is accepted and concludes that banks may earn higher profits but it does not have any effect on readability scores of their annual reports.

These above findings are supported by Courtis (1986); Subramanian, et al. (1993), they have examined the relationship between annual report readability and corporate profitability. Courtis (1986) finds neither company size nor profitability are associated with improved readability levels where as Baker and Kare (1992) find that the correlation coefficient between the readability index and the profitability of a firm is mixed. Subramanian et al. (1993), however, found a positive relationship between readability and profitability. Thus as per our findings banks with more profits or less profits do not show significant relationships with annual reports readability and understandability levels.

## **Conclusion**

Readability refers to the relative ease in which a written passage of text can be read and understood by others. Numerous mathematical formulas have been developed to support writers in computing the readability of their script. The research work is an initiative to test the relationship of readability levels of annual reports of banking sector with their performance figures. If disclosure readability is strategically used by managers to hide adverse information, a relationship between firm performance and readability

would be expected. So it is essential to study the readability scores of annual reports and to verify its relation with some of the important parameters which can make significant change in their readability scores. The study covers the annual reports of banking sector in India and compares the readability scores of these reports on the basis of independent variable i.e. profitability. Almost all the Indian commercial banks are covered and the sample of annual reports collected is 88. The study considered the annual reports of Indian commercial banks for 3 years from 2009 to 2012. Furthermore, 6 hypotheses are constructed to observe the relationship between the readability of annual reports and profitability levels of banks. Based on the ease scores, it can be inferred that the Indian commercial banks do not reveal their financial performances through proper readability of annual report.

Most importantly, the findings imply that, in the event of poor bank performance, the management does not attempt to make bank disclosure more prolix or syntactically complex in an effort to hide poor results. Therefore, the study concludes that if the disclosures of the commercial banks are more concise and syntactically simple, it does not indicate that the firm's performance was good. Moreover, the high or low profitability levels of Indian commercial banks does not make annual reports easier or harder to read and understand. In other words, there is no significant relationship among the readability levels of annual reports of banking sector with their performance figures.

### **Limitation**

The study considered the annual reports of the Indian banks for only three years, which may be extended for more years. The parameter chosen for comparison is profitability alone. There can be other measures to which may affect the readability scores of annual reports like age of the company, price to book value ratio.

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## Components of IT Business and Value Addition

IT industry can be seen as an amalgamation of different business components. Sometimes they are standalone business units. But often by mixing and matching they become a formidable compound business offering. The following table 1 shows the architecture of IT business, the components and the bouquets of IT industry offerings.

**Table 1 Components of IT Business and Value Addition**

No	Components of IT business	bouquets of offerings	Relative value add position
1	Hardware manufacture	Hardware(H/W) + Operating System(O/S)	Bottom of the pyramid
2	Systems Software	O/S, Sort, RDBMS, Networking (N/W) O/S with cards etc.,	Good value as once-produced, are used on every computer
3	Application Software	Applications like Pay Roll, Custom developed Software like inventory etc.,	Medium value add, Needs marketing push
4	Systems Integration	H/W + S/W + N/W + Custom developed Application	High Value add, Needs domain expertise. Examples: Reservation Systems, Banking Systems Etc.,
5	Software Products	Pure software, like MS Office suite, SAP, SPSS etc.,	Higher value add, needs innovation and marketing
6	Consultancy	Transformational and innovative business growth drivers.	Extreme value add, Drives all the above businesses. Needs deep knowledge, experience and insights.

Where is our IT industry vis a vis the above table now? And in which areas our companies are strong? In which geographical markets they should concentrate their efforts?

Before we can attempt to answer these questions, we have to examine the software exports scenario and the business delivery models thereof, as they emerged over the years.

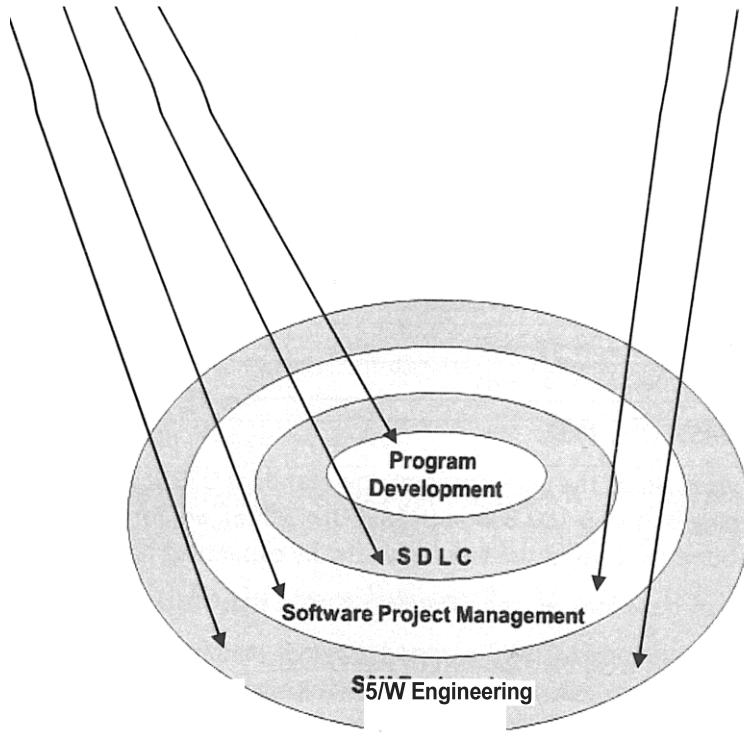
'Software Exports' Business Model and how work will shift now Onsite-Offshore and Offshore Development Centre (ODC) based delivery model:

The schematic figure below depicts the model generally adopted by software industry.

### Figure 1. Onsite-Offshore and Offshore Development Centre (ODC) based Delivery Model

Major work done in India

Some work done in customer's site/ country



The customer-interfacing work of Requirements gathering, Architecting the solution, and High-Level Design as part of Software engineering effort, are done at customer premises, generally abroad. The resources used are costly and time spent is less as a percent of the project life-time. Even now in the changed scenario, this will continue as before, albeit the human resources become costlier and perhaps project costs and timelines go up.

Almost 50 percent of the work earlier done from India was in the other three effort areas viz., Software Project Management (SPM), System Development Life Cycle (SDLC) and Programming activities. Major portions of these activities will now have to be shifted abroad due to new protectionist business scenario. This means down-sizing to some extent in Indian human resources and consequent upsizing of resources abroad. This will put high pressure on margins. This also can affect employment prospects in India at

4. Small niche firms doing good work in new technologies will prosper and grow.
5. There is going to be increasingly reduced deputation of software engineers either on short or medium-term basis in view of the HI-B salary criterion as per the revised policy. Purely, from a P& L point of view, this will have a negative bias on the margins.
6. Social Media, Big data, Big Analytics and AI are some of the areas that the Fortune 1000 companies are proposing to invest into, as part of their discretionary IT spending. Indian IT companies need to build deep competencies in these areas.
7. Indian market has become quite attractive in view of some of the programs such as 'Digital India', 'Make in India', and 'Smart Cities'. There is likely to be greater push into Indian market by Indian IT companies.

## **Conclusion**

Over the next 5 to 10 years, Indian IT companies will be challenged with increased protectionist pressures, reduced margins and increasingly complex IT requirements. This will translate into developing diverse skill sets by a typical software engineer. It is to be seen if the 'demographic dividend' will accrue to India or will it be a challenge for the industry and the country.

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## Economists' and Ecologists' Viewpoint about Sustainable Development

Rohit Kanda<sup>1</sup>

### *Abstract*

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*One who sinks a well lives in heaven for as many years as there are drops of water in it. But to dig ten such wells equals in merit the digging of ten such ponds was equal to making a lake; making of ten lakes was as meritorious as be - getting a virtuous son but begetting ten such virtuous sons had the same sanctity as that of planting a single tree. -Matsya Purana*

*Economic globalisation since 1991 has significantly increased rates of diversion of natural ecosystems for 'developmental purposes, and rates of resource exploitation for domestic use and exports (Kothari, 2013). Most of the world level Conferences attended by Premiers and Presidents of different nations have not been able to cut much ice. Development must be environmentally harmonious, economically justified and targeted towards equity coupled with social justice. One must understand the implications of fast economic development and the consequences of rapid depletion of natural resources causing an ecological imbalance which may prove fatal for the civilization (Bhalla and Khanna). Knowledge Networks need to be created urgently so that scientific assessment can take place of all viable and effective traditional knowledge.*

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**Key Words:** *Ecological Development, Community Based Conservation Initiatives, Indian Green Initiatives, Hurdles on the Way.*

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### Introduction

Faced with the over exploitation of natural resources that accompanied economic and demographic growth, the think tank known as the club of Rome, created in 1968, advocated zero growth. This group unites scientists, economists, national and international civil servants, and industrialists from 53 countries. In 1971, this private international association sounded an urgent alarm by publishing the limits to Growth. The United Nations

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Conference on the Human Environment in Stockholm in 1972 gave birth to the first true notion of sustainable development, which was called 'Eco Development' in those days. Thanks to the support of personalities such as Maurice Strong, Professor Rene Dubas, Barbara Wart and Ignacy Sacks, the integration of Social equity and ecological caution were incorporated into the economic development models for north & south. This would result in the creation of the UN Environment Program (UNEP) and the UN Development Program (UNDP). In the 1980's, the international union for the conservation of nature (IUCN) published its world conservation strategy. The term 'sustainable development' remained virtually unnoticed until its revival in the Gro Harlem Brundtland report 'our common future' published in 1987. Since then, the concept of sustainable development has been accepted all over the world (Summer and Michael, 2008). Economic globalisation since 1991 has significantly increased rates of diversion of natural ecosystems for 'developmental' purposes, and rates of resource exploitation for domestic use and exports. Framed in 2000, the MDGs set ambitious targets for tackling poverty, hunger, thirst, illiteracy, women's exploitation, child mortality, disease, and environmental destruction. Elements of a new Global framework (UN Conference on sustainable development ('Rio+20') of 2012) were: Ensuring ecological conservation and resilience, Providing adequate and nutritious food for all, Ensuring adequate and safe water for all, safeguarding conditions for prevention of disease, and maintenance of good health for all, providing equitable access to energy sources, facilitating equitable access to learning and education for all, and ensuring secure, safe, sustainable, and equitable settlements for all (Kothari, 2013).

The Paris Agreement marks the latest step in the evolution of UN climate change regime, which originated in 1992 with the adoption of the framework convention. The 1997 Kyoto protocol took a more 'top-down' but highly differentiated approach, establishing negotiated, binding emissions targets for developed countries, and no new commitments for developing countries. Because the United States did not join, and some countries that did set no targets beyond 2012, the protocol now covers less than 15 percent of global emissions. With 2009 Copenhagen Accord and 2010 Cancun Agreement, parties established a parallel "bottom-up" framework, with countries undertaking national pledges for 2020 that represent political rather than legal commitments. The negotiations

towards a Paris agreement were launched with the Durban platform for enhanced action adopted at COP 17 in 2011. The Durban platform called for "a protocol, another legal instrument or an agreed outcome with legal force under the convention applicable to all parties," to apply from 2020, But provided no further substantive guidance. COP 19 in Warsaw called on parties to submit "intended nationally determined contributions" (INDCs) well before the Paris conference, signalling an important bottom-up feature of the emerging agreement. Heading into Paris, more than 180 countries producing more than 90 percent of global emissions had submitted INDCs, a much broader response than many had anticipated. The Paris agreement articulates two long term emission goals: first, a peaking of emission as soon as possible; then a goal of net green house gas neutrality in the second half of this century (Sharma, 2016).

### **Sustainable Development: An Indian Perspective**

The concept of sustainable development as defined by the Brundtland Commission in 1987 is "the ability to ensure that humanity needs of present without compromising the ability of future generations to meet their own needs". It contains within it two key concepts: the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitation that is imposed by the state of technology and social organization on the environment's ability to meet present and future needs in a sustainable manner (Gupta et. al, 2016).

India has a prestigious history on environmental fronts, be it the Stockholm conference in 1972 which was attended by Late Smt. Indira Gandhi, or the UN Conference on Environment and Development, 1992 at Brazil where India's contribution and eco-concerns also figured in shaping the historic agenda 21. It was in 1991 that the honourable Supreme Court issued a directive for compulsory environmental studies in all undergraduate programmes in the country. India has a new water policy of 2012 now, but without subjecting it to a formal system of environmental assessment, despite having globally accepted too 'strategic environmental assessment' in practice. The Millennium Ecosystem Assessment (2005) that emphasised livelihood and food security as key challenges of human vulnerability is an insight to understand the significant efforts of intergovernmental panel on climate change. A 4x4 assessment of climate change impacts on India,

government to build two dams in this region in the late 1970s (Bhopalpattanam on Godavari and Inchampalli on Indravati). Due to strong tribal opposition, this project eventually got shelved but it started a strong movement towards tribal self-rule in the region. Mendha-Lekha, inhabited by the Gond tribal people, was one of the villages where a process towards self-rule gained momentum. Up to the 1950s, this forest was largely under the management of local tribal landlords. Forests were under the management of the Forest Department after India gained independence under the Indian Forest Act of 1927. As the villagers were increasingly restricted from using the forest resources for their daily needs, a system to pay bribes to the lower staff to have access to the forest was developed. This was the turning point. The villagers united into a Gram Sabha. Permission is needed from the Gram Sabha to enable outsiders (government officials, researchers, NGOs) to carry out any activity in the village or adjoining forests. In addition, institutions such as the Van Suraksha Samiti (VSS), Mahila Manda! and Abhyas Gats (study circles) have been formed to act as a forum for frank and in-depth discussions ranging from immediate village problems to wildlife conservation. Soil erosion and excessive runoff has been arrested by water and soil conservation efforts. Forests are protected from commercial activities such as the extraction of bamboo by paper mills and villagers have managed to control encroachments in the surrounding forests (Pathak and Gour-Broome, 1999).

## **6. Case Study of Chakrashila Wildlife Sanctuary, Assam, India (in the Dubri district of Assam in Northeast India)**

Chakrashila Wildlife Sanctuary (CWS) is spread over hilly terrain covered with dense semi-evergreen and moist deciduous forests, with patches of grasslands, scattered bushes and several water sources. Chakrashila Village is inhabited by ethnic tribes belonging mainly to the Rabha and Bodo communities, as well as a limited number of Garo and Rajbarshi families. The major threats to wildlife include smuggling, poaching, hunting, indiscriminate exaction of firewood by outsiders as well as villagers, and the poverty of the villagers. The thick forest along the periphery of Chakrashila got denuded, resulting in the villagers moving further into the forest and causing a drastic shrinkage of the forest area. The community involvement began with the efforts of an NGO called Nature Beckon (NB) which has



been involved with the Chakrashila Hills Reserve since the 1980s. The denuded forest regenerated as a result of these efforts along the periphery of Chakrashila. An office and training centre for youth and women of Chakrashila known as "Tapovan" was set up by the NB. Subsequently the Government of Assam declared Chakrashila forests a wildlife sanctuary under the Indian Wild Life (Protection) Act, 1972 (Kothari et al., 2000).

### **7. Community Development Project on Kali Bein in Punjab: the Seechewal Initiative.**

The Kali Bein is a river flowing in Punjab in which Guru Nanak, founder of Sikhism, is believed to have taken a holy dip and attained enlightenment five centuries ago. Beginning its journey from Terkiana marshland in the Mukerian sub-division of Hoshiarpur, The 160 km long river, merges at the confluence of the rivers Beas and Satluj at Hari-ke-Pattan, with a catchment area of 945 square km (Nigah, 2007). Falling prey to urbanization, commercialization and industrialization, the river had turned into a virtual sewer. In year 2000, in a meeting of intellectuals held in Jalandhar, where Pollution of the Kali Bein was the main agenda, Sant Balbir Singh Seechewal announced that voluntary work would start at the Bein and called upon the intellectuals present to join him in the task (Nirmal Kuteya, 2004). The voluntary work (kar sewa) for cleaning the Kali Bein started in July 2000 at Sultanpur Lodhi near Kapurthala in Punjab by Sant Seechewal. From July 2000 to April 2003, the kar sewa mainly focused on the cleaning and renovation of the holy rivulet at Sultanpur Lodhi. To raise awareness amongst the people of the villages and towns on the banks of the Bein about the need to clean the Bein, a campaign was organized in March 2003 under the leadership of Sant Seechewal. An appeal was made to join this voluntary service and thousands of men, women and children from villages far and wide in the area came forward. Thereafter, for a period of one year from May 2003 to May 2004, the community of villages along the Bein did a massive amount of work cleaning the Bein from the village Dhanoa where the Bein originates to the Kanjli wetland. In January 2004, the construction of Ghats or banks on the Bein was started. This task was completed by April 2004. Afterwards the task of cleaning the Kanjli Lake was started. The Kanjli wetland is located on this lake (Souvenir, 2006). Due to cleaning the Bein, water logging problems in some areas upstream have been eliminated, which has

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## HRD Practices in Indian Public Sector Companies: A Study on NALCO, Odisha

Mohd. Kamalun Nabi<sup>1</sup>

### *Abstract*

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*The present study attempts to analyse the human resource practices adopted by National Aluminium Company Limited, Odisha. The selected sample respondents for the study is selected from the NALCO Corporate Office (Bhubaneswar), Smelter Plant and Captive Power Plant (Anugul) and Mining and Refinery Complex (Damanjodi) units. The survey was conducted with the help of a structured questionnaire for eliciting the responses from the non-executives. The results reveal that the non-executives belonging to the aforesaid units of NALCO has a poor perception about the HRD practices prevailing in the organisation.*

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**Keywords:** *HRD Practices, Non-executives, NALCO*

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### **Introduction**

The changing scenario of global competition due to technological advancements and economic liberalization has led to a gradual shift from muscle to machine and brawn to brain power. It has been observed that organizational effectiveness hinges more on human resources. Of late, it has also been felt that Human Resources Development (HRD), is the key that provides a competitive edge to an organization. The public sector organizations in India are the forerunners of industrial economy. Being under the aegis of government ownership, they are considered as Model Employers. NALCO, established in 1980's, is a blue chip organization has been high in profitability in realm of public sector. There being a few empirical studies on the HRD practices of NALCO, any study in that area, would throw a new light on the unexplored aspects. The present study

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**Table 1. Composition of the Sample**

Units	Sample Taken	Total Strength
Corporate Office	24	223
Mining and Refinery Complex	88	1951
Smelter Plant	96	2568
Captive Power Plant	42	1047
Total	250	5789

Source: Primary data

## Analysis

The pay differentials between the lowest and the highest paid employees in the public sector used to be 20 times in the early 1970's. This came down to less than 6 in the mid 1990's. With time, the pay architecture has evolved in a way that the floor was raised but the ceilings are not raised accordingly. Also, the level of workers, staffs, supervisors and the number of grades has multiplied causing a great deal of compression.

**Table 2. Satisfaction level of existing Wage and Salary Structure**

Responses	Respondents	Percentage
Yes	184	73.60
No	66	26.40
Total	250	100.00

Source: Primary data

Against such a backdrop, the sample respondents were asked to opine whether they are content with their existing salary structure or not. Their responses are tabulated in the above Table 2 which shows that out of the total number of respondents, 73.60 percent are satisfied with the existing wage and salary structure of their organization. The rest 26.40 percent seem to be dissatisfied with it. Therefore, it is important for the management to

conduct a thorough analysis of the those factors that make the wage and salary structure of the organization satisfactory for maximum employees as it still remains one of the most important motivating factors for an employee.

**Implication and suggestions:** A possible solution to this problem is, apart from the problems that the public sectors facing due to additional costs of social responsibilities or the high degree of government interference, the pay can be linked to the employee's performance which associated with the job content, responsibility, skill and experience involved, mental and physical requirements and the hazards involved.

NALCO has a full-fledged compensation package for the employees involving the medical facilities and leave travel concessions. Apart from this it has a family welfare benefits, provision of Group Insurance Scheme and Benevolent fund Scheme. The responses of the sample of non-executives regarding the monetary benefits, against this backdrop can be found in the following Table 3.

**Table 3. Monetary Benefits provided by the Management**

Responses	Respondents	Percentage
Yes	205	82.00
No	45	18.00
Total	250	100.00

Source: Primary data

A cursory look at the above table reveals that out of the total number of non-executive sample respondents, 82 percent have experienced that the monetary benefits provided by the management has indeed motivated them, however the rest 18 percent do not feel so. Therefore, the management of an organization must focus on this aspect.

**Implications and suggestions:** The monetary benefits have increased the earnings of the employees as they are not taxable. Some of the common monetary benefits are medical insurance, retirement benefits, life insurance & saving plans. They help to protect the employees from the financial risks

inherent in their daily lives. The organizations carry standardised benefit packages in which the employees have very little to chose. However, these packages are becoming irrelevant due to the change in workplace demographic. Also, the employee preference for benefits should be considered before establishing the benefit programmes.

NALCO, on retirement, provides a lump-sum financial support as provident fund. It provides gratuity benefits and benefits on retirement, resignation, termination, wilful negligence or permanent disablement. On the basis of the response of the sample of non-executives regarding monetary benefits, following was the finding:

**Table 4. Satisfaction with the Post Retirement Benefits**

Responses	Respondents	Percentage
Yes	168	67.20
No	82	32.80
Total	250	100.00

Source: Primary data

The results show that 67.20 percent of the total number of employees are satisfied with the post-retirement benefits, whereas the rest 32.80 percent are dissatisfied with these benefits. Therefore, it is important for the management to analyse and work on those factors related to the provisions of such post retirement benefits that makes the employees satisfied.

**Implication and Suggestions:** The post retirement benefit is the defined contribution plan largely followed in organizations. They are financial programmes providing benefits to the retirees. It is essential for the organization therefore, to assess the environmental factors before establishing the plan for post retirement benefits. It is also essential to communicate the related information effectively to the employees. In order to keep the employees satisfied with such benefits, it is essential for the management of NALCO to foster external competitiveness, meeting the individual employee needs as well as complying with the legal compulsions.



As far as the training for non-executives in NALCO is concerned, the training needs are identified through the forms approved by the ISO system. It includes induction programmes, on the job training, apprenticeship training, refresher training, safety awareness programmes and workshops. The opinion of the sample non-executives regarding training can be seen in the following table:

**Table 5. Training Programmes for Employees**

Responses	Respondents	Percentage
Yes	179	71.60
No	71	28.40
Total	250	100.00

Source: Primary data

The results in the above table indicate that near about 72 percent of the non-executive respondents agree that the management regularly arranges training programmes for the employees. However, the rest 28 percent do not agree with this. It is therefore, important for the management to concentrate on the training of these non-executives for their skill up gradation with the changing technology.

**Implication and Suggestions:** A proper training to employees tends to foster authenticity, openness and trust in an organization. Apart from the usual benefits of training, some benefits that need to be mentioned, as far as the non-executives are concerned are motivation, problem solving skills, higher productivity, better communication and the ability to adjust to changes. It is essential for the management, therefore, to provide training programmes for the non-executives and should start from the level at which the trainees are. These can be done on a proper focus on lectures, job rotation, coaching, demonstration etc.

NALCO has specific rules with regard to promotions of non-executives known as "NALCO Promotion Rules for Non-executives, 1990". It comprises the general rules for promotion. In NALCO promotion is given on the basis of seniority. Promotion of non-executives takes place on the recommendation

of the Departmental Promotion Community (DPC) and the ratio between the vacancy and the eligible candidates is 1:3. The opinion of the non-executives as far as merit being the criterion for promotion can be seen in the following table given below:

**Table 6. Merit as the only Criterion for Promotion**

Responses	Respondents	Percentage
Yes	174	69.60
No	76	30.40
Total	250	100.00

Source: Primary data

The above table reveals that 69.6 percent of the non-executive respondents are of the opinion that merit should be the only criterion for promotion. As against this the rest 30.40 percent of them feel that apart from merit various other criteria should be there for the promotion of non-executives.

**Implication and Suggestions:** Though promotion on the basis of seniority has lesser scope for arbitrariness and loyalty is rewarded with time, but it may not indicate competence. The responsibility lies with the management of NALCO to maintain transparency while promoting the employees as well as to explore other suitable criteria for the promotion of the employees that is acceptable by them to a larger extent. Therefore, the management can consider competence also as one of the criteria for promotion that in turn can increase productivity.

**Table 7. Satisfaction with the Ethical Standards of the Organisation**

Responses	Respondents	Percentage
Yes	222	88.80
No	28	11.20
Total	250	100.00

Source: Primary data

The above table shows that out of the total number of sample respondents, 88.80 percent are found to be satisfied with the ethical standards of the organization, however only 11.10 percent are not satisfied with the standard of ethics in the organization.

**Implication and Suggestions:** A few important HR ethical issues in an organization may be related to employee responsibility, cash and incentive plans, performance appraisal, race and disability, restructuring and laying, safety and health, privacy issues and job discrimination. It is, therefore, important for the organization to redress at the earliest, any ethical issue that comes to the notice of the management. Therefore, the management of NALCO should encourage transparency. Also, any action to correct unethical conduct should not depend upon one's designation.

NALCO gives monetary and non-monetary rewards in the form of Suggestion Schemes, Sarjana Awards, Problem Solving Reward scheme, Merit Awards and Foundation Day Awards. Against such a backdrop, the respondents were asked to opine about the recognition and rewards.

**Table 8. Recognition and Reward**

Responses	Respondents	Percentage
Yes	164	65.60
No	86	34.40
Total	250	100.00

Source: Primary data

The above table reveals that 65.60 percent of the non-executive respondents felt that the services of the employees are properly recognised and they are rewarded by the management /superiors. However, 34.40 percent of them do not agree with this.

**Implication and Suggestions:** The reason behind these 34.40 responses is that the existing rewarding policies are outdated or do not suit their requirements. The organization may be following a progressive policy but it may be perceived as old and outdated. Therefore, NALCO should go for innovations and changes in the existing reward system. The management

also should try to introduce some newer categories of reward systems to have a better motivated and committed workforce.

NALCO has adopted the approach of Quality Circles that creates an environment for active participation in the area of problem identification and analysis, together with implementation of corrective measures. Presently, they have 25 Quality Circles in Mines and Refinery Complex, 13 in the Smelter Plant and 6 in the CPP. As far as the sample non-executives of NALCO are concerned, their opinion on participative problem solving is depicted in the Table 9.

**Table 9. Participation in Problem Solving**

Responses	Respondents	Percentage
Yes	188	75.20
No	62	24.80
Total	250	100.00

Source: Primary data

The above table indicates that out of the total number of respondents, 75.20 percent feel that the employees play a vital role in problem solving of the organization. As against this, 24.80 percent of the non-executives opine that employees are not able to participate in problem solving when required.

**Implication and Suggestions:** The concept of participation follows the philosophy that every employee in an organization is valuable and is involved in running the organization. In a way it provides them with the tool and authority for the smooth functioning of the organization. As far as participation in problem solving is concerned, some of the ways through which NALCO can satisfy its non-executives are management's attention, top management support, facilitator guidance, operational support as well as training. It can include any of the techniques such as suggestion systems, focus groups, surveys, self directed work groups, giving more responsibility to employees, process re-engineering, employee involvement or total quality management.

## Conclusion

The prevalent HRD scenario in NALCO remains to be fluid. This raises a question on the smooth functioning of the organization. The opinion of the sample non-executives on the prevailing HRD system is not satisfying. The various aspects of training, promotion, post retirement benefits, monetary benefits, recognition and rewards etc. if left unattended can lead to a lack of commitment, fire fighting orientation, un-preparedness for risk taking or accepting change etc. The management should adopt a nurturing leadership approach. The training module should suit and improve individual performance. Also, the management can introduce new category of rewards and the disgruntlement regarding the promotion of non-executives must be handled carefully. Also, the management can identify the different HRD interventions with the help of employee consensus. These requirements and expectations can be conveyed to the concerned authorities for further actions.

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## No Is Not Enough - Naomi Klein

C. P. Ravindranathan<sup>1</sup>

The ascent of Donald Trump to the US Presidency is universally regarded as a shock to the system. But what is remarkable is that Donald Trump himself seems to have viewed his capture of the most powerful office in the world, at any rate after he had won the Republican nomination, as the ultimate success of his adroit personal brand building in the world of superbrands. As for the Presidency itself, Donald Trump would famously have deal making as the centerpiece of his vocation. Now all this should be grist to the mill for business schools with their absorption in strategy, business models and brand meaning, even more than what actually would appear to be the case.

Naomi Klein through her bestsellers is a relentless narrator of the hollow brand model (own little, brand everything) and the shock doctrine. On the latter, she has written with urgent eloquence about the exploitation of large-scale shocks to societies in recent history by politicians and corporations, all to push through radical pro-corporate measures. In this book she turns a glaring light on the phenomenon of Donald Trump, not merely in terms of his application of shock politics to the US - witness the stream of presidential executive orders and the signature tweets on policy matters - but as something that embodies a combination of diverse global trends, all dangerous according to her. It is a political tract, uniformly trenchant on the man and his doings, but in conclusion sounding an idealistic call of arms for a moral alternative to the neo-liberal order.

As to the electoral dynamics in 2016, argues Naomi Klein, the racial and gender (highlighted by Hillary Clinton) resentments that did so much to bring Trump to power are not new, but have been omnipresent through history, rising and falling perennially. There are, however, deep structural reasons why Trump's version of a very old tactic centred on racial and gender resentments resonated so powerfully with the electorate. Some of them have to do with changes in the status of the white male, but what really worked in Trump's favour was how those losses in social status were

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layered on top of losses in basic economic security resulting from multiple factors from the flip side of neoliberal economic policies during the last forty years to the sheer power of hate in a changing and destabilizing world with a black President and the disruptive effects of globalisation. And these whites were not mostly poor, but solidly middle-income, between \$50,000 to \$200,000 a year with a concentration at the lower end of that range, even if their financial situation was worse now than heretofore, and since 2008, up against diminishing job security as well as whatever feeble safety net that used to exist.

Against this complex mix of factors America's two party system - described by late Christofer Hitchens as "two cosily-fused buttocks of the same giant derriere", but not quoted by the author - offered little meaningful choice to the electorate, particularly after the exit of the progressive alternative that Bernie Sanders certainly was to Hillary Clinton. It allowed Trump to make seductive promises that he would bring manufacturing jobs back for American workers and rid the country of those free trade agreements which took away jobs and markets for America's business and industry "putting white men safely back on top again". Pitted against these claims, Hillary Clinton's nee-liberalism with the unconvincing promise of making it more inclusive, lacked credibility with those white workers who had voted for Obama twice and decided this time to vote for Trump if only because his plans were at least different. According to Naomi Klein, Trump managed to carry off a dissembling posture as a champion of the working man not least because of the larger reality that the leftist movement of the late 1990s against globalization for its anti-labour and anti-environment ramifications had been appropriated after 9/11 in 2001 by the pseudo-populist far-right forces who directed it towards migrants and Muslims and anyone else who made an easy target. Trump with his corporate empire and the bankers and oil executives that he would choose subsequently for his administration is very much part of that milieu. Naomi Klein also argues that another factor that helped Trump to run for President and to persuade millions of Americans to vote for handing over the government to him was his status as a billionaire in a world where elite liberals had been increasingly looking to the billionaires like Bill Gates and Mark Zuckerberg to solve problems which earlier used to be addressed with collective action and a strong public sector.

The author goes on to make a telling argument: given the manifest trend of popular outrage at governmental failings and the general rejection of establishment politics in the US, it was Bernie Sanders who represented a transformative option in 2016. Much as his quasi social democratic stance was a point of departure in the American political discourse, Naomi Klein believes that it could return in full force the next time round. For Bernie Sanders showed that positions previously dismissed as too radical like universal public health care, breaking up of the big banks, free college tuition and above all, keeping fossil fuels in the ground could strike a decisive chord with the electorate because "the choice that may at first seem radical, may be even a little risky, (but it) may well be the more pragmatic one in this volatile era". It is a provocative logic that Klein puts forward.

Where the book attracts particular attention is in Naomi Klein's account of how Donald Trump set out his career in the corporate world and thence into politics, bringing in her masterly grasp of the logic of the brand all the way from the historical context beginning with the 1990s. Branding real estate in a pioneering move at a time the global high-end real estate market had offered abundant parking space to the vast untaxed private wealth sloshing around the world, he ingeniously parlayed the Trump organization brand into a related personal brand - with a menu of spinoffs - and managed to raise both to the level of super brands through his pro-active use of the reality television, *Apprentice* and all. As a businessman he had taken full advantage of the outsourcing economy and his hotels and towers had more than their share of scandals of ill treatment of labour, yet no labour nor income tax scandal could touch the beguiling power of his brand. Later as Presidential candidate he could win on a campaign that was unremitting in its thrust on loss of manufacturing jobs in the country and the pain of the American worker because "in the world he has created, he is just acting like a winner". Says Klein "...every traditional political scandal bounces off Trump. That's because Trump didn't enter politics as a so-called outsider, somebody who doesn't play by the rules. He entered politics playing by a completely different set of rules - the rules of branding". No doubt it was combined with far right populism, conjuring up various racist bogeymen like criminal immigrants, Muslim terrorists and Black activists who did not respect American soldiers.



The dominant theme of the book is shock doctrine defined as the brutal tactic of systematically using the public disorientation following a collective shock like wars or market crashes to push through radical pro-corporate measures. Naomi Klein believes that Trump and his top advisers are "trying to pull off a domestic shock doctrine" which includes the deconstruction of the regulatory state, a total attack on the welfare state and social services, all out promotion of the domestic fossil fuel industry both in denial of the global warming and rejection of climate science and a war against immigrants and radical Islamic terrorism. With the premise that the shock doctrine logic fits into Trump's view of the world, the book goes into detail about how he and the various members of his team -whom the author calls 'an all-star cast of crisis opportunists' - had individually exploited moments of crisis in the past to achieve their economic and political goals. It adds up to a sombre scenario as Naomi evokes future possibilities in areas of policy making and execution from these dramatis personae - ranging from expanded Homeland security and surveillance industry to economic crises through a frenzy of financial deregulation, future climate disasters and at the retail level increase in oil prices to benefit the industry. That it is all a little too alarmist is the thought with which one might seek some relief from these gloomy prognostications.

But much as Naomi Klein takes the view that Trump is less an aberration than "a pastiche of pretty much all the worst trends of the past century" and "the product of powerful systems of thought that rank human life based on race, religion, gender, sexuality, physical appearance and physical ability" (no stronger stuff has ever been written on the man), she believes that even if this presidency were to end "the political conditions that produced it and which are producing replicas around the world, will remain to be confronted".

A prescription for confronting those conditions is the 'yes' part of the book, the obverse side to the rejection of Trump. It is a tocsin call for a people's movement for political transformation that will lay out the core policies for economy, environment and tangible improvements in daily life that politicians who want their support must endorse. Such a truly progressive populist response to the crises of the present was attempted in Canada in 2015 with participation of leaders from across the country collectively

imagining what it would take to build happier, healthier communities. The platform resulting from that exceptional gathering turned out to be a dynamic project drawing support from an ever-growing national constituency including a clear majority of all three centre and centre-left parties of the country, with prospects of analogous action by organizers around the world.

An utopian note on which to end a searing indictment of Trump? But then Naomi Klein herself speaks of the need for the world to reclaim the utopian tradition "that animated so many transcendent social movements in the past".

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# JME

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