SUSTAINABILITY ISSUE AND LINKAGES BETWEEN KNOWLEDGE MANAGEMENT AND PRODUCTIVITY IN AUTOANCILLARY INDUSTRIES WITH REFERENCE TO PIMPRI CHINCHWAD INDUSTRIAL AREA

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ABSTRACT

This paper elaborates various linkages between knowledge management (KM) and productivity measurement (PM) in contest of developing productivity measurement to sustain automobile ancillary industries. Based on the literature review, a framework linking the management capabilities to support sustainability. The framework identifies ways to promote sustainability through the creating the effective links between KM and PM which the organization can develop their productivity to ensure sustainability across the business and social justice contexts. This approach provides the managers with framework for addressing sustainability issues and for developing individuals and organizational capabilities to support through KM and PM.

Key words: PM, KM, Sustainability.

1.0 INTRODUCTION

Knowledge Management is the collection of processes that govern the creation, dissemination, and utilization of knowledge. In one form or another, knowledge management has been around for a very long time. Practitioners have included philosophers, priests, teachers, politicians, scribes, Liberians, etc. So if Knowledge Management is such an ageless and broad topic what role does it serve in today’s Information Age? These processes exist whether we acknowledge them or not and they have a profound effect on the decisions we
make and the actions we take, both of which are enabled by knowledge of some type. If this is the case, and we agree that many of our decisions and actions have profound and long lasting effects, it makes sense to recognize and understand the processes that effect or actions and decision and, where possible, take steps to improve the quality these processes and in turn improve the quality of those actions and decisions for which we are responsible?

Knowledge management is not a "a technology thing" or a, "computer thing" If we accept the premise that knowledge management is concerned with the entire process of discovery and creation of knowledge, dissemination of knowledge, and the utilization of knowledge then we are strongly driven to accept that knowledge management is much more than a "technology thing" and that elements of it exist in each of our jobs.

What is knowledge?
Knowledge is the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations.
In today's economy, knowledge is people, money, leverage, learning, flexibility, power, and competitive advantage. Knowledge is more relevant to sustained business than capital, labor or land. Nevertheless, it remains the most neglected asset. It is more than justified true belief and is essential for action, performance and adaption. Knowledge provides the ability to respond to novel situations.

A holistic view considers knowledge to be present in ideas, judgments, talents, root causes, relationships, perspectives and concepts. Knowledge is stored in the individual brain or encoded in organizational processes, documents, products, services, facilities and systems. Knowledge is the basis for, and the driver of, our post-industrial economy. Knowledge is the result of learning which provides the only sustainable competitive advantage. Knowledge is the next paradigm shift in computing following data processing 1945-1965 and information management 1966-1995. Knowledge is action, focused innovation, pooled expertise, special relationships and alliances. Knowledge is value-added behavior and activities. For knowledge to be of value it must be focused, current, tested and shared.

What is Knowledge Management?
Knowledge management is an audit of "intellectual assets" that highlights unique sources, critical functions and potential bottlenecks which hinder knowledge flows to the point of use. It protects intellectual assets from decay, seeks opportunities to enhance decisions, services and products through adding intelligence, increasing value and providing flexibility.

Knowledge management complements and enhances other organizational initiatives such as total quality management (TQM), business process re-engineering (BPR) and organizational learning, providing a new and urgent focus to sustain competitive position.

Why should you apply Knowledge Management?
To serve customers well and remain in business companies must: reduce their cycle times, operate with minimum fixed assets and overhead (people, inventory and facilities), shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adaption, capture information, create knowledge, share and learn.
None of this is possible without a continual focus on the creation, updating, availability, quality and use of knowledge by all employees and teams, at work and in the marketplace.

**Productivity**

The aim of this productivity management guide is to provide small business owners and managers with an overview of how company productivity can be improved. It covers what productivity is, how it is measured, and what a company can do to increase it.

Why should productivity management growth be a national concern? It is because, if too low, the Nation can neither improve its standard of living at home nor compete successfully abroad. Productivity growth affects wage negotiations, inflation rates, business decisions, exchange rates, a host of other economic, political and social conditions, and, therefore, every small business owner and manager.

The factors affecting both National and individual firm productivity are many and diverse. Nationally, changes in employment, hours worked, the educational, age and sex composition of the work force, levels of capital investment and savings, government regulations, capacity utilization, inflation, among others, all can affect, favorably or unfavorably, productivity rates.

There are many productivity factors the firm can manage. How well does the firm utilize new knowledge; is it working at an economy-of-scale level; are the employees highly motivated and loyal or is there labor unrest and high worker turnover; is the resource (human and capital) allocation maximizing established goals; and finally, what is the overall quality of the company's management? And, if management sees productivity as a problem, is there a commitment to establish a company-wide Productivity Improvement Program?

Knowledge Management and the Links to Productivity Studies of productivity in the auto ancillary industries struggle with the issue of what constitutes the output of auto ancillary industries (Loveman, 1994) The various approaches chosen to evaluate the output of auto ancillary industries may be classified into three broad categories: the assets approach, the user-cost approach, and the value added approach (Berger & Humphrey, 1992). However, Benston et al. (1982) posit that output should be measured in terms of what auto ancillary industries do that causes operating expenses to be incurred. Whatever the approach may be, productivity cannot be ascertained outside the ambiance of how a firm’s intangible asset, knowledge, is managed and controlled. Therefore, it is a strategic and operational knowledge for increasing productivity, improving relations and developing quality that underpins everything that the organisation does. Also, Young (as cited in Asian Productivity Organisation, 2008) postulates that knowledge management strategies must be aligned to productivity, relations and quality because all senior management are ultimately interested in increasing sales and/or services, reducing costs and optimizing the delivery of value and/or profit. Hence, effective productivity, improved relations and quality product development is made possible by a firm’s ability to manage its knowledge effectively and efficiently.

**2.0. OBJECTIVE**

The general objective of the study was to find out the extent to which innovation and productivity can be attained through the management of knowledge in auto ancillary industries. The specific objectives seek to find out:
The strategies employed by auto ancillary industries in creating and sharing knowledge.

- The extent to which knowledge sharing is key to the success and survival of auto ancillary industries
- The impact of knowledge management on the performance of auto ancillary industries.
- The competitive excellence gained by auto ancillary industries through knowledge creation and management.
- The benefits of knowledge management to auto ancillary industries.

3.0 STATEMENT OF PROBLEM

Outsourcing could generate several millions of cost saving but concurrently generate surplus of staff who might need to be redeployed or laid off. The most crucial problem was the loss of key knowledge to sustain the core business. Secondly, the switching cost is high and very difficult to change back to in-sourcing since the market size is small and not easy to find sufficient expertise to support and maintain the system. Thirdly, the company will totally rely on contractor and is very difficult to request for higher service standard or flexible scope of works unless to pay more money to contractor or to revise the scope of work. In the long run, the existing contractor already dominates the market and keeps the key knowledge as their proprietary asset. The company will be hard to invite other contractors to beat the new maintenance contract. As a result, monopoly will be occurred. The company may enjoy lower cost at the beginning but suffer from higher cost in the long-term.

1. capital investments in production
2. capital investments in technology
3. capital investments in equipment
4. capital investments in facilities
5. economies of scale
6. workforce knowledge and skill resulting from training and experience

4.0 HYPOTHESIS

- Knowledge management is a fulcrum of auto ancillary industries for capital investment in production.
- Production and knowledge Management function cannot be isolated and it is an integral part of capital investment in technology.
- Workforce knowledge and skill can be improved by creating appropriate knowledge management linkages in the organization.
- Economics of scale is a strategic production function rather than individual leadership in the organization.

5.0 RESEARCH METHODOLOGY

Auto ancillary industries are selected for study. Randomly 25 industries were selected to understand the between knowledge management (KM) and productivity measurement (PM) in contest of developing productivity measurement to sustain automobile ancillary
industries. Interview and discussion method was used to collect the data. Production managers were interviewed and information was collected. Focus of interview was to understand the various linkages the between knowledge management (KM) and productivity measurement (PM). Knowledge Management practices used in these industries is also an area of interest.

6.0 LITERATURE REVIEW

Knowledge management

Many definitions regarding knowledge management (KM) can be found in literature written by famous scholars such as Darroch, 2003; Lee and Yang, 2000; Lee et al., 2001; Nonaka, 1994). It is essential to understand the definition of knowledge before having a better understanding of KM. According to Nonaka (1994), knowledge is a comprehensive concept with profound meanings, bearing the belief that it increases an organization’s ability for effectual action. Knowledge can be further divided into two, that is, tacit knowledge and explicit knowledge (Nonaka, 1994 and Gupta et al., 2000). Tacit knowledge is defined as one that is inherent inside an individual and according to Nonaka, (1994); Lin and Lee, (2004), it is acquired through imitation and practice. On the other hand, explicit knowledge is defined as a data which is either technical or in academic terms or information that is written in a formal language (Smith, 2001; Ooi et al.,2009). Furthermore, explicit knowledge can be further articulated in the form of rules, guidelines and principles (Nonaka, 1994). Four different forms of knowledge conversion were mentioned by Nonaka (1994), namely socialization, externalization, combination and internalization, in which the model explicitly describes the conversion of knowledge being a spiral and continuous process between the interactions between explicit and tacit knowledge.

KM is defined as a methodological method that enhances the capability of a company to assemble and organize the knowledge in order to improve the decision making ability and business strategy formulation process (Hsu and Shen, 2005; Ooi et al., 2009). According to Darroch (2003), KM is termed as a process for knowledge creation and manages the distribution and sharing of knowledge within and between each organization.

Darroch’s definition of KM portraits that KM is made out of three main sections, which are knowledge acquisition, knowledge dissemination and knowledge responsiveness; whereas for Lee et al. (2001), KM incorporates only two parts, namely knowledge acquisition and knowledge dissemination. From the process point of view, KM consists of knowledge creation, knowledge retrieval, and knowledge sharing and knowledge application (Nonaka and Takeuchi, 1995). Based on the statements given above, KM behaviours cover the acquisition of knowledge, the dissemination of it as well as the application.

These three constructs of knowledge have soon become the major concepts of KM, whereby each construct of KM is presented as dependent on the other components. In other words, knowledge is acquired, distributed and then comes the application part.

Productivity Concepts and Measures

Productivity is an overall measure of the ability to produce a good or service. More specifically, productivity is the measure of how specified resources are managed to accomplish timely objectives as stated in terms of quantity and quality. Productivity may also be defined as an index that measures output (goods and services) relative to the input (labor, materials, energy, etc., used to produce the output). As such, it can be expressed as:
Hence, there are two major ways to increase productivity: increase the numerator (output) or decrease the denominator (input). Of course, a similar effect would be seen if both input and output increased, but output increased faster than input; or if input and output decreased, but input decreased faster than output.

Organizations have many options for use of this formula, labor productivity, machine productivity, capital productivity, energy productivity, and so on. A productivity ratio may be computed for a single operation, a department, a facility, an organization, or even an entire country.

Productivity is an objective concept. As an objective concept it can be measured, ideally against a universal standard. As such, organizations can monitor productivity for strategic reasons such as corporate planning, organization improvement, or comparison to competitors. It can also be used for tactical reasons such as project control or controlling performance to budget.

Productivity is also a scientific concept, and hence can be logically defined and empirically observed. It can also be measured in quantitative terms, which qualifies it as a variable. Therefore, it can be defined and measured in absolute or relative terms. However, an absolute definition of productivity is not very useful; it is much more useful as a concept dealing with relative productivity or as a productivity factor.

Productivity is useful as a relative measure of actual output of production compared to the actual input of resources, measured across time or against common entities. As output increases for a level of input, or as the amount of input decreases for a constant level of output, an increase in productivity occurs. Therefore, a "productivity measure" describes how well the resources of an organization are being used to produce input.

Productivity is often confused with efficiency. Efficiency is generally seen as the ratio of the time needed to perform a task to some predetermined standard time. However, doing unnecessary work efficiently is not exactly being productive. It would be more correct to interpret productivity as a measure of effectiveness (doing the right thing efficiently), which is outcome-oriented rather than output-oriented.

Productivity is usually expressed in one of three forms: partial factor productivity, multifactor productivity, and total productivity. Each one is now discussed.

PARTIAL-FACTOR PRODUCTIVITY

The standard definition of productivity is actually what is known as a partial factor measure of productivity, in the sense that it only considers a single input in the ratio.

Managers generally utilize partial productivity measures because the data is readily available. Also, since the total of multifactor measures provides an aggregate perspective, partial factor productivity measures are easier to relate to specific processes. Labor-based hours (generally, readily available information) is a frequently used input variable in the equation. When this is the case, it would seem that productivity could be increased by substituting machinery for labor. However, that may not necessarily be a wise decision. Labor-based measures do not include mechanization and automation in the input; thus when automation replaces labor, misinterpretation may occur.

Other partial factor measure options could appear as output/labor, output/machine, output/capital, or output/energy. Terms applied to some other partial factor measures include capital productivity (using machine hours or dollars invested), energy productivity (using kilowatt hours), and materials productivity (using inventory dollars).
TOTAL FACTOR PRODUCTIVITY

A broader gauge of productivity, total factor productivity is measured by combining the effects of all the resources used in the production of goods and services (labor, capital, raw material, energy, etc.) and dividing it into the output. One example, is a ratio computed by adding standard hours of labor actually produced, plus the standard machine hours actually produced in a given time period divided by the actual hours available for both labor and machines in the time period.

Total output must be expressed in the same unit of measure and total input must be expressed in the same unit of measure. However, total output and total input need not be expressed in the same unit of measure. Resources are often converted to dollars or standard hours so that a single figure can be used as an aggregate measure of total input or output. For example, total output could be expressed as the number of units produced, and total input could be expressed in dollars, such as tons of steel produced per dollar input. Other varieties of the measure may appear as dollar value of good or service produced per dollar of input, or standard hours of output per actual hours of input.

Total productivity ratios reflect simultaneous changes in outputs and inputs. As such, total productivity ratios provide the most inclusive type of index for measuring productivity and may be preferred in making comparisons of productivity. However, they do not show the interaction between each input and output separately and are thus too broad to be used as a tool for improving specific areas.

Total Factor Productivity is a measure favored by the Japanese, whereas labor productivity is the measure favored by the United States. As such, the individual "productivity" of the American employee tends to be the best in the world, in that an American employee can purchase more eggs per one hour of work than anyone else in the world. But as a measure of national productivity, the Japanese have, in the past, tended to be better performers.

PRODUCTIVITY MEASURES

It has been said that the challenge of productivity has become a challenge of measurement. Productivity is difficult to measure and can only be measured indirectly, that is, by measuring other variables and then calculating productivity from them. This difficulty in measurement stems from the fact that inputs and outputs are not only difficult to define but are also difficult to quantify.

Any productivity measurement system should produce some sort of overall index of productivity. A smart measurement program combines productivity measurements into an overall rating of performance. This type of system should be flexible in order to accommodate changes in goals and policies over time. It should also have the ability to aggregate the measurement systems of different units into a single system and be able to compare productivity across different units.

The ways in which input and output are measured can provide different productivity measures. Disadvantages of productivity measures have been the distortion of the measure by fixed expenses and also the inability of productivity measures to consider quality changes (e.g., output per hour might increase, but it may cause the defect rate to skyrocket). It is easier to conceive of outputs as tangible units such as number of items produced, but other factors such as quality should be considered.
Experts have cited a need for a measurement program that gives an equal weight to quality as well as productivity. If quality is included in the ratio, output may have to be defined as something like the number of defect-free units of production or the number of units which meet customer expectations or requirements. The determination of when productivity measures are appropriate performance measures depends on two criteria. The first is the independence of the transformation process from other processes within the organization. Second is the correspondence between the inputs and outputs in the productivity measurement process.

7.0 DATA ANALYSIS

Following are the major observations during the various interviews conducted for auto ancillary production managers. Auto ancillary industries have gone through a rapid growth phase for last decade. These industries are mainly working as suppliers to large scale manufacturing companies. The business solely depends upon the manufacturing schedules of their major clients. Auto ancillary industries are now growing through a phase of development of concrete organization structure. HR function is undergoing a major change and new practices are being developed.

Interview summary:
Roles: - Strategic Partners, Administrative Experts, Change Agents
- Majority of auto ancillary industries are proprietary firms. The owners now give importance for development of organization structure. Functional structure is developed with reporting structures. There are department heads which have a specific role as administrative experts and change agents. There is a gap between the company expectations and skills available.

Strategic Focus: - Management of Strategic Capability, Developing and Sustaining Organizational Capability, Emphasis on Short as well as long term Strategic Focus, Sustainability and Renewal
- Auto ancillary industries are developing a strategic focus for development. Major concern for these industries is, the sustenance and growth depends on their clients for which they are working. Cost reduction pressures and lead times are major concerns. Industries are trying to gear up with new management techniques and functional responsibility centers. Retention of people is major issue for skilled employees. The shortage of experienced managerial staff, who can independently manage the show, is a major hurdle in development of long term strategic focus. Proprietors have major focus on client development rather organization development. Some companies have achieved organizational structure development but they are facing a problem of functional leadership.

Relationships: Building and sustaining relationships with employees, managers. Linking directly with organizational values and relationships across supply chain.
- Some companies have incorporated production practices such as regular performance appraisals, Training need identification and training actions. Developing a relationship is a perceived value in these industries. Efforts are made to have long term sustainability of operators by providing benefits at par with industry standards. Role of Production department is enhanced specifically for technical staff selection. Auto ancillary industries are also trying to attract senior and experienced employees to take higher positions with independent charge for the functions.
Learning Focus: Managing Intellectual Capital, developing human capital, creating learning environment, encourage knowledge creation and sharing, emphasis on constant renewal.

- For sustenance auto ancillary industries are dependent upon their large scale clients. In the process of growth, as a need for sustenance, these industries accept variety of products with multiple deliveries and small quantities. The requirement from large scale clients, medium scale industries have to invest in new technology to fulfill demand requirements.
- Auto ancillary industries face a problem of shorter span of skilled labours. They recruit semiskilled employees because of cost constraints, and provide on the job training to develop technical skills. Retention of this skilled labour is a major concern. There is a serious need for experts in production process to handle this concern.

While conducting interviews, it was observed that Production function is gaining importance in growing medium scale industries. A lot of work is to be done to have completely functioning production. Business leadership and sustenance are key concerns for these industries and they are making efforts to cope up with it.

8.0 Sustainability, Production and KM: Connection

Sustainability is often still seen as novel and elusive concept, which is hardly surprising in that disposability, was an inherent element in the consumerism that helped to power the previous industrial economy. In today’s economy, where so much importance is attributed to the search for sustainable resources and institutions, knowledge-based theory underpins much of the strategic thinking in organizations. In the knowledge-based view, this organizational knowledge is acknowledged as the most valuable organizational asset and the ability to manage knowledge strategically as the most significant source of competitive advantage (Barnes, 2002). Knowledge is both the key resource and a basis for sustainability, but knowledge and associated knowledge management practices must also be sustainable. In the wider search for sustainability, issues of context, of culture and appropriateness are of paramount importance. In the realm of context, the focus should be on community as well as on process. In this way, knowledge management can enhance the potential for knowledgeable practices that are “envisioned, pursued and disseminated, with other actors
encountering these new practices and learning from them to develop their own local knowledge” (Cushman et al, 2002).

The scope of knowledge management exists largely in the contextual filter that spans boundaries between various interactions between people, organizations, national cultures and international bodies. Effective linkages that support sustainability can only be achieved through mutual understanding of the contextual aspects relating to the broad ranges of situations and frameworks in which sustainability issues are cast. Knowledge management involves managing the context and thereby the interface, between the two.

In the realm of context, knowledge management can provide a range of boundary spanning activities and support mechanisms. These include knowledge creation, knowledge sharing, appropriate frameworks, enablers, infrastructure, measurement, feedback, learning and education.

The application of knowledge and expertise, through KM and HRM, can act as resources to support sustainable development. The deeper the intensity of knowledge and information exchange, the better the chances for developing effective management and leadership capabilities to support sustainability. Both situated and contextual understandings related to sustainability goals and practices are needed. In order to facilitate this, new modes of knowledge management are required, as the drivers of the mainstream approaches to management development have largely reflected different visions and objectives. The focus must be on creativity, on internal organizational dynamics and the social processes of human interaction. Human interaction and how it occurs, is central to knowledge creation and transfer. It helps to shape organizational routines within which useful knowledge can be exploited as an organizational rather than an individual resource (Carlisle, 2000). Knowledge-based theorists argue that firms that develop unique capabilities in the management of knowledge processes can build distinctive competencies based upon exploiting the growing knowledge generated by these processes. (Carlisle, 2000). One obvious example here would be the capability for integrating knowledge from a wide range of disparate sources. Such organizational knowledge-based capabilities are culturally bounded and contextually-dependent, and hence difficult for competitors to replicate. It is in the synergies between these capabilities and competencies, the learning, cultures and behaviors that the richness of the potential relationship between KM and HRM is displayed.

From an HRM perspective, a number of things have to happen. Strategic HRM can help to support sustainability through the identification of capabilities specific to sustainability and by seeking to align recruitment and selection practices to these capabilities. Through supportive development programs and learning support these capabilities can be further developed. This includes identifying key individuals to be fast-tracked into sustainability roles, normally on the basis of their personal values and extensive networks and relationships. Sustainability goals can be built into the HR strategic plans to support the same goals in the overall business plan (Barton et al, 2000).

9.0 CONCLUSION

Sustainability in auto ancillary industries is a function of business ownership and organizational structure. The proprietor nature of medium scale industries has a greater impact on business leadership and sustenance. Currently there is a positive trend for recognition of Production function in the industries. These industries have to develop a long term approach for production development.
Productivity improvement can be achieved in a number of ways. If the level of output is increased faster than that of input, productivity will increase. Conversely, productivity will be increased if the level of input is decreased faster than that of output. Also, an organization may realize a productivity increase from producing more output with the same level of input. Finally, producing more output with a reduced level of input will result in increased productivity.

Any of these scenarios may be realized through improved methods, investment in machinery and technology, improved quality, and improvement techniques and philosophies such as just-in-time, total quality management, lean production, supply chain management principles, and theory of constraints.

A firm or department may undertake a number of key steps toward improving productivity. The lists these steps to productivity improvement:

- Develop productivity measures for all operations; measurement is the first step in managing and controlling an organization.
- Look at the system as a whole in deciding which operations are most critical, it is overall productivity that is important.
- Develop methods for achieving productivity improvement, such as soliciting ideas from workers (perhaps organizing teams of workers, engineers, and managers), studying how other firms have increased productivity, and reexamining the way work is done.
- Establish reasonable goals for improvement.
- Make it clear that management supports and encourages productivity improvement. Consider incentives to reward workers for contributions.
- Measure improvements and publicize them.
- Don't confuse productivity with efficiency. Efficiency is a narrower concept that pertains to getting the most out of a given set of resources; productivity is a broader concept that pertains to use of overall resources. For example, an efficiency perspective on mowing the lawn given a hand mower would focus on the best way to use the hand mower; a productivity perspective would include the possibility of using a power mower.

As a cautionary word, organizations must be careful not to focus solely on productivity as the driver for the organization. Organizations must consider overall competitive ability. Firm success is categorized by quality, cycle time, reasonable lead time, innovation, and a host of other factors directed at improving customer service and satisfaction.

Today there is little awareness about knowledge management application in auto ancillary industries. These companies do have training and development activity for employees, but major thrust is on short term requirement rather than long term retention policy.

Sustenance, business leadership, knowledge management and role of production are interlinked through complex chains. All links must be strong enough to support other functions. Any weak link may create impact on the results achieved and organization may have to compromise on results or substandard outputs.

Developing a business leadership should be a focus area for each employee. In current global environment, auto ancillary industries need to focus this aspect of production development. Production function needs to change a perception from training and development to creating a knowledge management attitude.

Strong links between the Productions, Knowledge Management will ensure the business leadership for sustainable development. There is a need to fix a priority for sustenance and leadership skills development. Connectivity between sustainability, Production can be further leveraged through the inclusion of strategic provision for
production development, in the context of knowledge-related capabilities and competencies. Performance management and remuneration can also be tied to specific indicators relating to the identified capabilities and desired behaviours.

Finally, for auto ancillary industries, the key to maximizing the contribution towards sustainable business leadership, established management practice such as production should promote awareness and understanding concerning the implications of the essential approaches to KM. This requires an understanding of deeper underlying values and assumptions, coupled with an appropriate alignment between overall, strategy, a sustainability dimension, KM and PM.

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