ECO-KNOWLEDGE MANAGEMENT: A CASE STUDY OF ITC LIMITED

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Abstract :

The implementation of a sustainable mode of development has become the major aim of public policies in industrial countries and the evolution of economic agents behaviour(Producers and consumers) is considered as the engine of this 'new economy'.Enterprises are thus induced to develop socially responsible behavior , that is to say, to “integrate social and environmental concerns in their business operations and in their interactions with their stakeholders on a voluntary basis”.For firms, the development of green innovations stresses the necessity to develop responsible behavior .In IndianTobacco Company limited, the notion of sustainability operates at the economic, social and environmental level, and is driven by a concern for development and growth that is underpinned by a sense of social responsibility.ITC Ltd (India Tobacco Company limited), a major player in the tobacco products market in India and also diversified products(Hotels,Papers,Confectionaries etc. is implementing Eco friendly practices such as, carbon positive, water positive and solid waste recycling positive for its businesses for a long time.This paper reveals ITC's Eco-knowledge management model by taking into consideration the triple bottom line components, like business(economic), society (social), and nature (environment), on the one hand, and knowledge management, which means to discover,develop, utilize, deliver, and absorb knowledge inside and outside the firm, on the other hand.The study is aimed to develop the understanding of eco-knowledge management model development at the firm level.From eco-logical perspective a model that consists of knowledge distribution, knowledge interaction, knowledge competion and knowledge evolution(DICE) among ITC products is proposed.These four elements interact with each other and evolve to maintain healthy knowledge ecology in ITC organisation.In this context too, individual knowledge would have to be transferred from peopel to people (Tacit Knowledge) to processes and/or organisational knowledge base to improve products and organisational goals(Explicit Knowledge).This is an area where a linkage between knowledge management and HRM may prove to be effective.There are different typologies of knowledge in an organisation such as tacit and explicit knowledge. It is argued that it is the tacit knowledge & explicit knowledge, which cannot be easily communicated and understood between people who are working, Therefore the role of a HR manager is to create communities of practice (CoP), job-rotation, coaching, mentoring, Networking, quality circles, project meetings, which creates knowledge sharing culture for people in the ITC organisation.

Key words :Eco-innovation, Firm, Capabilities, Knowledge Capital , Collaboration

Introduction :

Awareness of the significance of sustainability is growing rapidly, with particular emphasis on sustainable development as an area of concern. Issues related to sustainability crosscut many boundaries, as they are both trans-disciplinary and transorganisational in nature. The notion of sustainability operates at the economic, social and environmental level, and is driven by a concern for development and growth that is underpinned by a sense of social responsibility. For instance, various national and international imperatives highlight the growing concern for protecting the overall environment for future generations through the development of and adherence to sustainable development concepts . In dealing effectively with sustainability issues, a wide range of factors need to be taken into consideration – for instance, across organisations, industry sectors, national boundaries, national and international institutions and regulatory agencies.In terms of fostering sustainable development in the so-called knowledge economy,there is a need to consider how best to make knowledgeable interpretations and recommendations to support sustainability across a wide range of stakeholders. A commitment to sustainable development requires enlightenment within organisations as well as at the government level, appropriate infrastructure as well as management of uncertainty and risk. Above all, a commitment to sustainable development requires sound knowledge on which to base decisions, as well as effective knowledge management approaches to support crucial processes of knowledge creation, sharing and dissemination to support sustainability issues. This includes an understanding of the role of knowledge and information, and their implicit imperfections . Knowledge for sustainability highlights the need for new knowledge,for new ways of managing knowledge, and for new work practices to support this process.At present it is not well understood how sustainability knowledge can be effectively brought together, managed and shared for effective decision making in a sustainability context. However a company likes ITC provides knowledge for sustainable development.

Literature Review : Interlinking Ecological Concepts and Knowledge Management Frameworks

Knowledge Management Frameworks

Research in KM can be traced to early work in the sociology of knowledge around 1970's, and technical work in knowledge-based expert systems in the 1980's. In a review on KM and knowledge management systems (KMS), Alavi and Leidner[1] examined previous research from a process views.

This research included activities such as creation, storage, retrieval, transfer, and application.

Another framework proposed by Davenport [2] stresses the exchange value of knowledge in a marketplace. KM was outlined as the problem of creating an effective and efficient knowledge marketplace in the organization. In their paper, they also illustrated key domains for pragmatic research on KM. It

constructed relevant questions, such as strategy, structure, culture, and technology, which could facilitate knowledge process. Leidner [3] used the framework developed between 1990 and 2001 to classify KM research,, into four scientific principles: the normative, the interpretative, the critical, and the dialogic. In the normative ideology, researchers were concerned with codification, the normalization of experience, and the search for authoritative relationships. The study reported that about 70% of the literature contained this paradigm. In a recent work, Argote et al. [4] presented a KM framework, called "knowledge outcomes" that enhanced the traditional KM process by incorporating properties of knowledge context. In their study, KM outcomes include knowledge creation, knowledge retention, and knowledge transfer. KM context affects KM outcomes and can be organized according to whether they are properties of a unit, such as an individual group or organization.

This is based upon properties of relationships between units or properties of the knowledge itself.

These diverse perspectives portray a rich picture of KM research. However, there are still important issues in KM that have not been investigated. From a top manager's point of view, a key concern would be whether KM should focus on a few key categories of knowledge or a broad scope of all kinds of

knowledge under resource constraints? What kinds of knowledge configuration should be kept in the organization? What should the organization do to manage knowledge evolution to meet the dynamic change of the business environment? In this paper, we reiterate these questions from the ecological perspective.

Ecological Perspectives :

Ecology is a science being used to analyze the relationship among members or species of a community and their interaction with the environment. Traditionally, ecology is defined as "the scientific study on the interactions that determine the distribution and abundance of organisms" Kerbs [5]. Ecological study has been conducted at the species, the population, the community, and the ecosystem level. Species are the basic elements in ecology. A group of organisms of the same species occupying a particular space at a particular time form a population. Several populations gather together to become a community. The ecosystem includes the numbers of organisms, the mineral elements and the energy in which the complex and intrinsic interactions occur.The purpose of ecology is to investigate the complex relationships between individuals and populations and between organisms and their environments. This area of interest has received tremendous attention in different fields of research that are derived from antiquity and are based on the sophisticated foundation of science which was given by McGlade[6]. In social science, ecological theories have received vast attention in the fields of evolutionary economics and organizational ecology Hannan and J.Freeman [7]. In organizational ecology, in the populations and communities of organizations, the ecology of organizations builds on the generalized ecological and evolutionary models of change. This ecological evolutionary approach is directly associated with organizational diversity, which is specific to the interrelated synergies between sources of increasing diversity and decreasing diversity Hannan and J.Freeman[7]. Ecological theories have introduced a creative view into organizational science, which has received significant attention. Four concepts have been found to provide major functions in ecological research. They are ***D****istribution*, ***I****nteraction*, ***C****ompetition* and ***E****volution* of species and the acronym for this is designated the DICE model.

The Emergence of Triple Bottom Line (TBL):

The concept of the *triple bottom line* was firstly launched and promoted by John Elkington[8]. The author

argues, first of all, that firms need to adjust in order to survive into an environment which is permanently and radically changed by the globalization and the (more and more intense) civic activism. By this concept, largely accepted and used today, the author "expresses his conviction that businesses do not follow just one goal – *to add (economic) value* – but they have also to follow other *social and ecological responsibilities*; by doing this, the accounting of tomorrow's operations will contain, together with the well known calculus of strictly economical efficiency, a balance sheet of the firm's activities effects on the environment and another one regarding the consequences of this activity over the social environment".As a result, Elkington John[8] dedicated one chapter of his book to each one of the *7 dimensions*he discovered to be responsible for the conceiving and realizing of the strategies of those firms which adopted or are about to integrate the sustainable development (as an imperative requirement for surviving): markets, values, transparency, technological cycles, partnerships formulas, time and firm management. From all these determinants of change, Elkington constantly emphasizes the three complementary dimensions of sustainability: *ecological, economic and social*.This type of approach has been captured by the global firms which are committed to thesustainable development and which adopt reporting principles based on the concept of (TBL). So, the firms' reports now contain information about the performances of the firms in all three areas of interest – economic, social and ecological – and all of them became integrant parts of the principles, strategies and operations that firms implement and act on.
These arguments have been developed by looking at three different cases: the firm as altruist, as coerced egoist, and as strategist. The idea behind the TBL paradigm is that a firm's ultimate success or health can and should be measured not just by traditional financial bottom line, but also by its social/ethical and environmental performance. Triple bottom line reporting, although a step towards increasing the awareness of multiple, competing, simultaneous objectives for organizations, is an inadequate, and perhaps detrimental, representation of organizational sustainability

Models of Knowledge Management:

At a micro level are several important synergies that firms have to satisfy to become truly sustainable and to promote a sustainable behavioral model of management: Eco-Knowledge, Socio-Knowledge, and Ecological-Knowledge.From the Dyllick and Hockerts[9] point of view, these three dimensions are related to:
economically sustainable firms, socially sustainable firms, and ecologically sustainable firms.
(1) Economically sustainable firms guarantee at any time cash flow sufficient to ensure liquidity while producing a persistent above average return to their shareholders.
(2) Socially sustainable firms add value to the communities within which they operate by increasing the human capital of individual partners as well as furthering the societal capital of these communities. They manage social capital in such a way that stakeholders can understand its motivations and can broadly agree with the firm's value system.
(3) Ecologically sustainable firms use only natural resources that are consumed at a rate below the natural reproduction, or at a rate below the development of substitutes. They do not cause emissions that accumulate in the environment at a rate beyond the capacity of

the natural system to absorb and assimilate these emissions. Finally they do not engage in activity that degrades eco-system services.

The model of management is based on the synergy between triple bottom line components and knowledge management characteristics. The proposed model tries to reveal the importance of the link between the two dimensions: TBL and KM. In order to become sustainable, a firm must implement an efficient behavioral model of management. We also consider that knowledge management is an imperative for the firms who are concerned on TBL. In this case, the elements that make the link between TBL components are:

(1) Eco-Knowledge: a firm must posed explicit and implicit knowledge in business (economic) and nature (environment) fields;

(2) Socio-Knowledge: a firm must posed explicit and implicit knowledge in business (economic) and society (social) fields;

(3) Ecological-Knowledge: a firm must posed organizational knowledge in nature (environment) and society (social) fields

These interrelations are able to create synergistic effects for a firm and give them a specific sustainability

About ITC :

ITC is one of the India's foremost private sector companies with a market capitalization of over US $ 33 billion and a turnover of US $ 7 billion. ITC has a diversified presence in Cigarettes, Hotels, Paperboards & Specialty Papers, Packaging, Agri-Business, Packaged Foods & Confectionery, Information Technology, Branded Apparel, Personal Care, Stationery, Safety Matches and other FMCG products. ITC's philosophy is not only driving each of its businesses towards international competitiveness but also consciously contributing to enhancing the competitiveness of the larger value chain of which it is a part. With new customer demands and higher awareness together with tougher global competitive pressure, ITC believes that Eco friendly Manufacturing should be viewed as an opportunity to expand the local and global market share in this dynamic environment.It is a sustainable approach to the design and engineering activities involved in product development and /or system operation to minimize environmental impact. The study revealed that in a context of sustainability of a firm, considering eco-management model interlinking with knowledge management discipline as a new path which generates the growth in future.ITC's triple bottom line is people(society),planet(Environment) and profit(Business).

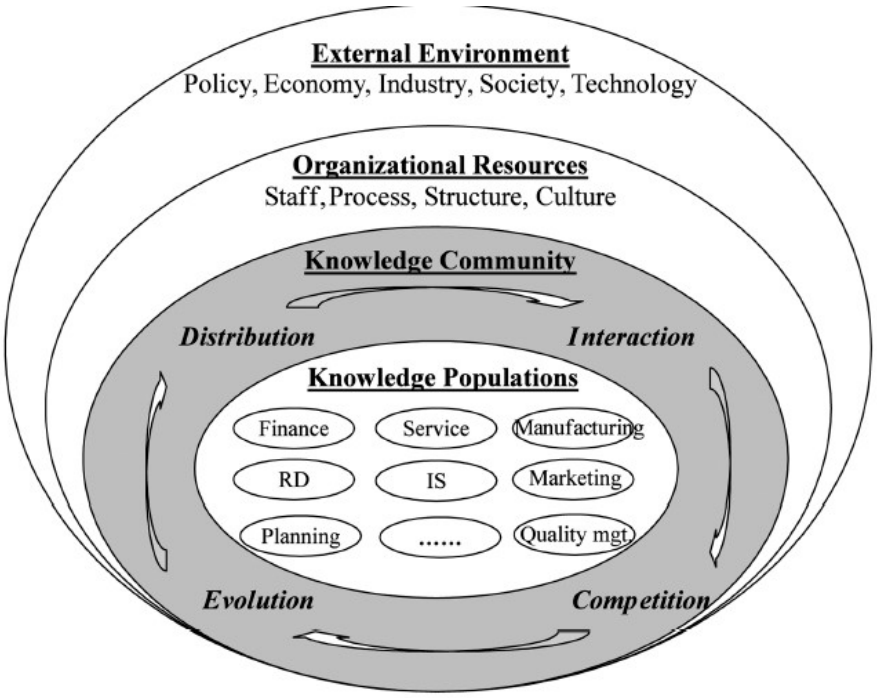

FIGURE 1 — Conceptual Illustration of the Knowledge Ecology in an Organization

From the above fig.1, ITC operates on Eco-Knowledge Management Model for its products which is also called as DICE Model: ,Knowledge Distribution,Knowledge Interaction and Knowledge Competition and Knowledge Evolution.

(1)Knowledge Distribution :ITC believes the managing the distribution of knowledge in the organization is importantand it will affect will affect the performance of the organization.With the objective of achieving "Zero Waste", each department becomes more professional and the knowledge intensity is reflected in the groups abilities to solve problems and to identify the waste reduction opportunities during its process. ITC uses knowledge map which is a tool for capturing and representing organisational knowledge from abstract to reality. In addition to knowledge sources , ITC considers two apsects are important for its organisation's knowledge map:Knowledge Intensity and Knowledge Diversity. They allow the effect of knowledge distribution on organizational performance to be monitored.

- **Knowledge Intensity :** It is the relative strength of a particular knowledge population in the ITC as compared to others.It highlights that each departmental employee is reponsible for 24-hour monitoring of all aspects of energy usage and its audits.The whole knowledge community will get better competitve advantage.ITC distributes "Resource Report Cards" to various departmental managers to provide feedback on energy usage and water use.Different regional heads will provides different repors . The data thus collected are then analysed to identify conservation opportunities.
- **Knowledge Diversity**: Diversity in knowledge reflects the equitable measure of the species in the knowledge community.ITC studies the relationships between different types of knowledge and knowledge transfer in virtual teams. It believes the distribution of knowledge across individuals , teams and the organisation may be changed by the combination of Information technology and the virtual team's work.Through cross-functional liaision (Homogenous and Heterogenous groups)among empleoyess for better organisational learning for eco-friendly operations.ITC belives that groups whose members have more diverse knowledge configuration outperform those whose

members are more homogenous.Through crossfunctional liasion ITC company provides employees to understand various aspects of environmental issues, identifying ways to reduce waste and mitigate the risk of causing environmental damage.ITC provides support for cross-departmental operational network(Spanning Human Resources, Finance and Logistics) for better environmental achievement.

(2) Knowledge Interaction : Knowledge interaction represent the dynamic behaviors of knowledge populations in an organisation.Most knowledge creation activities in organisations such as socialisation, externalisation, combination and internalisation.In ITC the form of knowledge interactions can be personal communications or personnel flow within the community or outside the community and are called internal interaction and External interaction.

- **Internal Interaction :**Internal interaction means people share information and knowledge within a community.Internal interaction between employees allows information and knowledge to be shared among different populations in the same organisation.Every employee in ITC should understand their role and participate in the manufacturing process. ITC believes that Internal training and education for employees can nurture a green culture and creating an awareness of green practices for implemenation.ITC emphasises that through training and development, employees acquire new knowledge through interaction with one another.This tacit knowledge will not be displayed in the document.However, it is valuable to the growth of employees.ITC, educates its employees on the green concept.The company offers environmental training , the opportunity to participate in the environmental committee.
- **External Interaction :**External interaction means knowledge population communicates with other knowledge populations outside the organisation, this is a common practice and allows knowledge to be introduced into an organisation from outside resources.ITC believes that knowledge management should transcend organisational boundaries , and increase knowledge transferrring will improve partnership with others.For designing Carbon labeling products(emmission of carbondioxide quantity in grams into the atmosphere) during the manufacture, the company consults Suppliers, NGOs and the government which are essential for green manufacturing.ITC highlights that NGOs plays a vital role in promoting green practices in the manufacturing industry by recognising sustainable products with their certifications.

(3)Knowledge Competition : When an organisation is under resource constraints , different knowledge populations will need to compete in order to grow.The competitive behavior among knowledge populations will influence the organisations ability to manage its knowledge effectively.In ITC, competition makes strong populations grow up and weak populations turn down at the moment.Knowledge competiton in ITC, can be collaborative or conflictive.

- **Collaborative Competition :**In ITC, collaborative competition targets a win-win situation under resource constraints that will benefit the entire organisation.Ex: In ITC, once the organisation recieve customer complaints about product defects, all related departments got involved and collaborated to fix the problem.Solutions from different groups were analysed and compared to find the best solution, before it identifies which unit was responsible for the problem.The organisation says that people are very co-operative to improve the process, technology and new product development as well as opportunities for its business.ITC's Wealth out of Waste(WoW) is a recycling initiative that

works towards spreading awareness about recycling and encouraging people to segregate and dispose waste responsibly.The company says, everyone is responsible for the world's recycling industry promoting recycling across the globe.

- **Conflictive Competition :**Conflictive comeptition refers to confrontation behavior.Although this exists, it will not occur in a well managed organisation.ITC foresaw the existence of competition among different knowledge groups at the beginning.ITC provides a new management information system that enables employees all over the world to manage standard and customised environmental performance across the whole enterprise.Such a tool offers user-friendly way to input, access consolidate and anaysed data, enables its staff(each individual) to compare current performance with what in previous years.This new management system measures and controls the firm's environmental performance and allows it to establish clear and objective goals to reduce its carbon foot print.In ITC the importance of measurement and control to ensure the success of eco-friendly products.So, ITC concerns about individual employees for unwillingness to share knowledge among group members due to internal performance competition.The company re-engineered the management information system , while including the knowledge sharing as an important indicator in the performance appraisal for reducing competition between individuals to a certain extent.Competition might still occur behind the scene, but most employees are required to share knowledge under the current system.

Therefore, we find that collaborative competition relies on a cooperative culture, while conflictive competition must be controlled by the performance appraisal scheme.Finally,Knowledge competition can be managed by fostering a sharing culture and enforcing a sharing-related performance evaluation scheme.

(4).Knowledge Evolution : It is the dynamic capability, to which every organisation should strive to integrate, build and reconfigure their competences under a rapidly changing environment.The knowledge sources that are the driving forces of knowledge evolution : internal and external.In ITC, the competion pressure coming from internal employees or external rivals drives these two types of knowledge sources.In knowledge evolution, two major forces will cause variation of the population and affect the evolutionary pattern : knowledge mutuation and knowledge crossover.

- **Knowledge Mutuation :**In knowledge ecology, knowledge mutation is defined as changes or enhancement of knowledge.This is motivated by internal forces and self-examination.Knowledge mutuation refers to New knowledge derived from internal mutuation wille be innovative and significantly different from old knowledge.ITC employees believes that the better an organisation improves its internal environmental management mechanism, the better its financial performance will be.For this they believe that , reducing waste is fundamental to pollution prevention, which focuses on minimising waste in internal operations (Ex: The use of pollution control equipment).In general, opportunities for waste reduction can be identified through a life cost analysis to determine ways for eliminating waste at all stages of manufacturing process, from raw material acquisition to waste reclaimation from customers.The concept of waste reduction highlights product design and process development for eliminating waste and reducing life cycle environmental costs, such as green house emissions.This environmental awarenesss helps the continous update of the operating knowledge and results in performance enhancement.

- **Knowledge Crossover:** Knowledge crossover refers to the evolution that involves combination with knowledge acquired from external knowledge populations.In knowledge ecology, knowledge crossover is identified as changes or enhancements of knowledge initiated by forces outside a knowledge community.

In ITC, considerable new knowledge, such as new technology infrastructure and new material for manufacturing, is acquired from other firms.Sometimes the company invites the other firms to give a talk to provide consultation for the issues like Green Procurement,Green Product design,Green packaging,Green Promotion and Green after-sales service, involving co-operation from both sides including licensing and new hiring.

Thus an organisation need to take advantage of both internal and external knowledge sources to enahance the qauality of organisational knowledge overtime.Internal evolution can be fostered by policy enforcement, while external acquisition must be carefully calibrated.

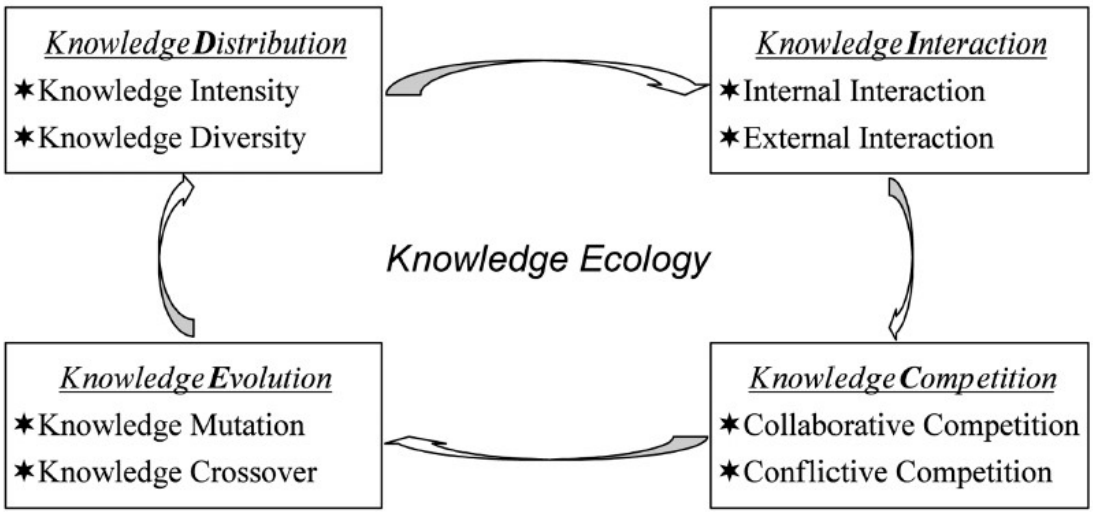

FIGURE 2 — Major activities in the DICE Model

The role of Human Resource Manager in making Knowledge Capital Organisation :

The learning process is a process by which repetition and experimentation lead to the fact that, over time, tasks are done better and faster, and new opportunities in the procedures are constantly being tested. That process generates the production of cumulative knowledge materializing in organizational routines defined as models of interactions that are effective solutions to specific problems. They form an "organizational memory" embedded in the skills of workers and machinery.Technological capabilities and technological success are not nowadays considered as the results of the firms‟ own resources but are the outcome of complex processes of collaboration and cooperation.According to ITC, the learning process and the building of immaterial specific assets gathering internal and external resources is achieved by and lead to the construction of what we call the firm's knowledge capital. “Knowledge capital” is defined as the set of information, knowledge and know-how produced, acquired, combined and systematized by the enterprise in order to create value. Studying the knowledge capital of a firm means analyzing the way the enterprise

acquires and collects information on markets, produces knowledge alone or/and in collaboration internal R & D, partnerships , transforms it into knowledge, routines and know-how which are a source of specific advantages and uses that knowledge and information in a process of value creation. The building and the renewal of the knowledge capital appears as a tool to build new technological capabilities.

Creation of organizational knowledge, sharing and integration of such knowledge within the entire organization,all these organizational processes require human learning and action processes which are facilitated by the human resources manager in the ITC Organisation.In ITC the tacit or implicit knowledge are held in non-verbal forms, and therefore , the holder(employee) cannot provide a useful verbal explanation to another individual.Therefore the HR Manager in ITC creates the following mechanisms for effective knowledge sharing culture to deliver eco-knowledge management model for its process.

Mechanisms are :

1. Communities of Practice
2. Story Telling
3. Quality Circles
4. Mentoring
5. Coaching and Job rotation
6. Networking

Networking , Communities of Practice, Story telling,Coaching , Mentoring and Quality circles are important mechanisms for sharing and transferring tacit knowledge in the environment.Communities of practices are needed to encourage individuals to think of themselves as members of ' Professional families with a strong sense of reciprocity'.The company provides 'human networking process', which can encourage sharing and the use of knowledge for eco-innovation are important.The company shared knowledge stays with the giver while enriching the reciever.Intuitive knowledge is managed by individuals being and not by being heavily-handed through organisational processes.The HR department in the organisation believes that intuitive knowledge cannot be manipulated in any meaningful way nor controlled without the individual being willing and privy to it.The process of trying to manipulate or control intiutive knowledge infact creates their destruction. ITC believes that the issues of trust, respect and reciprocity are vital elements of a conducive environment for managing tacit knowledge.The regual communication of the benefits of knowledge management is important in sustaining the co-operation of team members.ITC creates a variety of ways for doing this, including regular meetings, intranet facilities where they exist.

Conclusion :

ITC adopts Green as a part of core business strategy,executing green initiatives across the value chain by shifting towards Green energy, Green products, Green processes, communicating and promoting green initiatives and their benefits to all stakeholders.Knowledge ecology based on the DICE model has provided a new perspective to investigate the knowledge management in the ITC organisation to promote green innovation. It suggests a macro view to manage knowledge assets and dynamic view maintain the competence of knowledge resources in uncertain environments.The paper describes for ITC survival, an organisation should maintain a helathy knowledge distribution among various knowledge groups.By different types of

interaction and competition, the knowledge groups would change.ITC pays attention to the sources of knowledg that trigger the knowledge evolution and whether internal or external interaction is more effective for the organisation.Finally, they would evolve into new type of knowledge assets to cope with the competitive pressure and keep the competition advantages.Efforts by the ITC firm to the manufacturing processes and increase productivity create substantial opportunities for environmental improvement.The paper has considered the importance of knowledge management in ITC environment and the role of creating organisational knowledge capital by the human resource manager in the organisation.Knowledge, especially tacit knowledge, provides opportunities for organisational creativity and eco-innovation.The important mechanisms for sharing and transferring tacit knowledge include communities of practice(CoP), networking, coaching, mentoring and quality circles.A favorable organisational culture and environment is vital , if tacit knowledge is to be nurtured and exploited for the pupose of eco-innovation.Such an environment needs to recognise that the workforce has huge reservoirs of knowledge, feelings, ideas, emotions , imagination and creativity which can be respectfully taped into.The individuals can be motivated to share their experiences and exploit their creativity.ITC and its plants that are R&D intensive and manufacturing innovators possess the capacity to both improve productivity and reduce environmental costs and wastes through carbon positive, solid waste positive and water positive. The framework and findings from this case study provide useful guidelines for managing knowledge from the ecological perspective.

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