

Integrated Knowledge Management Model For Poultry Network of Rural India

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Abstract: Poultry which is one of the main sector in rural economy of India, supports many families and is backbone of rural economy. Presently eggs, meat collection, meat processing and distribution system are carried out by domestic and private sector by unscientific and inefficient methods. In this paper, Information Technology Enabled Knowledge Management (ITEKM) model has been proposed for improving the Decision Support System (DSS), related to right from collection and distribution of eggs, meat from rural area along with in all availability of its as per location and knowledge require for the successful running of poultry farming. This ITEKM model will give optimal solution for movement of eggs, meat etc. from surplus area to deficit area. Also it will update in real time regarding every aspect of poultry farming like knowledge required for trouble shooting of problem arises in regular activities of poultry farming. In ITEKM model, the computerized communication system will schedule the transportation, which will ultimately reduce the losses due to transportation of eggs. This model will also act as a DSS for higher authorities to take appropriate policy decision in various critical situations.

Keywords: Decision Support System (DSS), Information Technology Enabled Knowledge Management (ITEKM) Model, Poultry

Introduction

Globalization that is economic world without borders is here to stay. No activity whether it is social, economical or cultural cannot do without the impact of globalization. This globalization has created an inevitable and essential requirement for any economic activity to get success to have technology-enabled systems. Domestic, commercial or Co-operative poultry industries are not exception to the aforesaid fact. It means that for the sustainable perpetual development of poultry industries implementation of the latest development in IT field and GPS related technology is a must. Keeping in view the fostering growth of IT enabled and GPS related technologies & their successful implementation in poultry industries has created an earnest & immense need in the mind of researchers to conduct an empirical, exhaustive study in domestic & co-operative poultry industries. With the help of IKM approach knowledge required in meat, egg, manufacturing allied products etc. can be integrated & enriched for increasing overall profit of poultry.

Poultry

Poultry farming in India has a long history but it is only about last four decade that it has been practiced in a “scientific manner”. From backyard poultry to commercial poultry farming, the poultry industry has emerged as a gainful and dignified business enterprise in India and elsewhere in the world.

Young student encyclopedia defines poultry as “birds raised for their meat and eggs are called poultry”. Chickens ducks, turkeys, guinea fowl, pheasant and pigeons can be poultry birds. According to the illustrated encyclopedia, ‘poultry’ includes all domestic birds that are raised for food. Among these birds are chickens, ducks, turkeys, pigeons are raised for meat and others for eggs

A Socio-economic & structural characteristics condition of the poultry farmers varies from rural area to rural areas of different district. This provides the rural farmers an excellent business opportunity which requires very little additional expenditure. This business has helped poultry farmers from this region by stabilizing their financial conditions and increasing their income, resulting in the improvement of their living standards. The poultry industry has played an important role in the economic development of the people from rural areas. In fact, poultry farming has become an indispensable component of agricultural industry in India.

Food of adequate quality is to be provided in sufficient amount to meet the needs of the population, which is growing at a faster rate than food production. Animals also compete directly with man for their basic food supply. India’s animal wealth is huge in terms of population-cattle(204.5million), buffaloes (84.2million), poultry(800 million), sheep(50.8 million), goats(115.3 million) & pigs(12.8 million). Chicken dominates the poultry production in India with nearly 95% of the total egg production & the rest is contributed by ducks & others. Compared with the rest of the livestock sector, the poultry industry in India is more scientific; it is well organized, progressing towards modernization. The Indian poultry industry’s success story is uniquely exceptional & from a backyard venture, it has made a quantum leap to emerge as a dynamic industry.

A) Poultry Development in India

In India poultry production which has remained as backyard venture till 1960 and now India is ranked as the third largest egg and fifth largest poultry meat producer and its capability in employment generation and

enhancing rural incomes is well known. Livestock supports income and generates rural employment, especially for the landless, small and marginal farmers and women. Small farmers find a support in this business since the poultry farming can be practiced as a supplementary or second income generating mechanism. Millions of people are engaged in poultry sector, apart from numerous small poultry keepers in rural and tribal areas for the country. Now the overall growth rate of the poultry industry is 15-20 percent per annum. About 70% of the national poultry output is supplied by organized sector, a major supply. Poultry industry with about 139 million population producing 12,500 million eggs annually has been deemed to be a commercially viable enterprise contributing more than Rs 400 crores to the Gross National Product (GNP).

B) Poultry In Maharashtra

The Maharashtra poultry farming industry has shown appreciable growth in the last 4 decades ending in 2010. According to the live stock census, Maharashtra is 3rd in poultry population, ranking after Andhra Pradesh and Tamil Nadu. It also ranks 3rd in eggs and poultry meat production.

C) Cooperative Poultry Industry In Maharashtra (India)

Cooperation and coordination is the real base of human society. The co-operative movement is well flourished in Maharashtra by efforts and philosophy of Rajarshi Shahu Maharaj and Mahatma Phule. 'The way of cooperation is the only way to the prosperity' was well understood by Mahatma Gandhi. These co-operatives have changed the lives of millions of people from villages. The beauty of the rural co-operative movement is these big establishments of hundreds of crores of rupees are owned by semiliterate and poor farmers. But now a day, the co-operative industries are suffering from many problems and most of the problems are related to management. The ignorance of the farmers, egg supplier's lack of transparency in the management and slow rate of information processing, leads to losses, corruption and misappropriation of funds. The co-operative poultry factories are not only income generating or egg producing establishment, but also are amongst the biggest employers.

D) Evolutionary Phases of Poultry Sector

Over the years, the poultry industry has undergone tremendous changes in its structure and its operations. In four decades, the industry has grown from a subsistence activity into an organised, scientifically-oriented and technologically-driven industry. The structure of the poultry industry, in India consists of two groups – organised and unorganized sectors. The organised sector contributes 70 percent and the remaining 30 percent is contributed by the unorganized sector. The organised sector uses intensive farming, sophisticated breeding systems, and modern technology to generate greater productivity but with limitation like not being used for KM. The unorganized sector, on the other hand, has no promotion for brands. The poultry sector has evolved through three distinct phase's namely traditional, semi-commercial and commercial system.

E) Structure of Poultry Production

Poultry farming involves breeding, raising chicks, Layer farms and Integrators for various purposes.

1. Breeding farms: They hatch and raise poultry for sale to other farms.
2. Broiler farms: They rear chickens for meat, procuring day-old chicks, keeping them for around 6 weeks.
3. Layer farms: They keep hens to produce eggs.
4. Integrators keep breeding stock and also operate hatcheries and commercial broiler farms.

All these sectors along with routine activities can bring in to a single network. This is not only for marketing & distribution but from overall KM point of view.

In the era of globalization and liberalization, all industries in private sector have improved their management system through Information Technology and they have improved their performance as well. But the domestic and co-operative sectors of poultry are lagging behind in this regard. Hence it is a national and social need that the management of these should be improved through Information Technology. Of course, many suggestions and solutions have come forward for the automation of the poultry industry, but due to lack of requisite research and investigation, no solution could solve many problems which remain as it is in the poultry industry. Therefore, the best-suited system to these industries should be consistent to salient features of poultry industry, which are as under:

1. The management of poultry industry encompasses illiterate, by some extent politically motivated persons having their vested interest mainly in cooperative sector.
2. Instead of having pure democracy, there exists 'autocratic democracy' in cooperative poultry industry as the control of the industries lies in few hands only. The persons who are dominating and having great influence over the farmers run the show hence centralization of power takes place, which creates discrepancies and discrimination in the organization.
3. In addition to above management related features, another special feature relating to operations of cooperative poultry industry is that, perhaps poultry cooperatives are the industries where the purchase price of egg is varied at the time of its sale to the customer. This particular feature creates a suspicion and confusion in the minds of poor poultry farmers about the rightness of the price of their poultry products.

Review of Literature

A) Knowledge

This is, as the word implies, the ability to manage “knowledge”. We are all familiar with the term Information Management. This term came about when people realized that information is a resource that can & needs to be managed to be useful in an organization. From this, the ideas of Information Analysis & Information Planning came about. 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.

Organizations are now starting to look at “knowledge” as a resource as well. This means that we need ways for managing the knowledge in an organization. The main part of this process is “knowledge”. This knowledge is with all the experienced and senior people. They have the vast storage of knowledge within themselves. The most disappointing thing is that this knowledge is not documented anywhere. It is kept with the owner itself. When people grow rich in experiences, then these experiences transform into knowledge. Now it’s the real time to use all these knowledge from the experts to make the things better.

B) Knowledge Management (KM)

Truthfully, KM doesn’t have one meaning. Everyone defines it differently. But all the varied opinions seem to agree on one thing-KM is capturing what everyone in your department knows. And capturing what everyone in a legal department knows can make the difference between winning and losing a case, or at the very least between spending thousands of dollars and spending millions.

What KM boils down to is finding ways to minimize redundancy, in turn saving time and cutting costs. How a legal department decides to follow through with this initiative depends on a number of factors. But there are some clear steps you must execute well to build a successful process.

By Keith Ecker, Defining the concept of KM is difficult, since different perspectives of KM can yield different dimensions and meaning. A good KM definition is given by Swan, Scarborough & Preston (1999), who defined it as “any process or practices of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and Performance in organization”.

There are two types of KM - 1. Explicit and 2. Implicit

Explicit: Also referred to as information, this is tangible knowledge.

Example: E-Mails, Status and case updates, Contract and policy templates, Audio content.

Implicit: Also referred to as tacit knowledge, this is information stored inside people’s heads.

This explains two fundamental approaches to knowledge management. The tacit knowledge approach emphasizes understanding the kinds of knowledge that individuals in an organization have, moving people to transfer knowledge within an organization, and managing key individuals as knowledge creators and carriers. By contrast, the explicit knowledge approach emphasizes processes for articulating knowledge held by individuals, the design of organizational approaches for creating new knowledge, and the development of systems (including information systems) to disseminate articulated knowledge within an organization. The relative advantages and disadvantages of both approaches to knowledge management are summarized. A synthesis of tacit and knowledge management approaches is recommended to create a hybrid design for the knowledge management practices in a given organization.

Knowledge management brings to mind many things to many people. But in a business setting, a practical definition prevails. The effect of knowledge management, how knowledge management is different from information management, types of knowledge, the knowledge chain and its role in measuring the success of knowledge practice and the basic knowledge management applications.

C) The General Knowledge Model

Knowledge Creation: This comprises activities associated with the entry of new knowledge into the system, and includes knowledge development, discovery and capture.

Knowledge Retention: This includes all activities that preserve knowledge & allow it to remain in the system once introduced. It also includes those activities that maintain the viability of knowledge within the system.

Knowledge Transfer: This refers to activities associated with the flow of knowledge from one party to another. This includes communication, translation, conversion, filtering and rendering. Transfer of Knowledge improves system quality by providing quick feedback, a variety of alternatives, predictable screen changes, and enhanced customer support.

Knowledge Utilization: This includes the activities and events connected with the application of knowledge to business processes.

Knowledge and Learning within a Project: Knowledge has a long established role in theories designed to explain organizations and their performance. In earlier theories it appeared under the guise of “technology”. Lately, theorists have given knowledge a more explicit role of its own.

This focus on knowledge derives from several key insights:

- Environmental turbulence (e.g., regulatory and technology changes) has forced many organizations to innovate faster & to operate more efficiently. This pressure requires a focus on continual learning & renewal.
- Specialist or distinctive knowledge embodied in products or services can be a source of competitive advantage and therefore drive value creation.
- The means by which organization is effected (lines of authority, integrating committees, etc.) can be conceptualized in terms of knowledge and information processing.
- Knowledge and information have characteristics that distinguish them from other organizational resources, e.g., persistence, negligible cost of duplication, low visibility, and intangibility.

Factors Affecting on Sales, Distribution

Egg is also used for preparation of a variety of products such as medicines, paint, varnishes printer ink, adhesives, soaps, shampoos, egg powder, yolk powder, egg weight powder, lysozyme etc. Also poultry manure is an extremely rich source of nitrogen and organic material is in demand as agricultural input. Thus it focuses its attention on the production efficiency and marketing potentialities of the poultry units and their related problems, with a futuristic manifestation and visualization. Egg being highly perishable and fragile by nature needs special care during transportation from producers to consumers. The major problem faced by these engaged in marketing of eggs is that of maintaining the quality during the process of distribution. The future structure of egg industry depends on incorporation of well balanced plan for marketing and production. In spite of rapid growth, the poultry industry suffered many setbacks in recent times due to rising cost of feed, emergence of new or reemerging of existing diseases, fluctuating market price of egg and broilers, cost affected by diseases and parasites. Air pollution and water pollution also create different types of contingencies diseases. The middlemen engaged in this industry take away a lion's share of profit of the egg producers. Fluctuations in prices fall in summer and go up in winter due to the main problem of preservation, festival months. etc. which need to be addressed to make the poultry sector as a sustainable enterprise. Issues relating to animal welfare and environmental pollution by poultry units have been of increasing concern. There are three prominent marketing channels-poultry owner, wholesalers, retailers and consumers, price takers fixed by the consortium of the various cooperative groups and also like Egg Co- ordination Committee and have to adjust the market structure. In spite of the fact that poultry farming becoming a good subsidiary occupation for many farmers and improves their conditions, there are problems creeping in the production and marketing side of industry.

Gap

A major constraint affecting the growth of the poultry industry in India is the lack of basic infrastructure such as storage and transportation, including cold chain. As a result, there are wide price fluctuations in the prices of poultry products, i.e., eggs and broilers. An inefficient marketing system- The presence of so many market intermediaries harms both the producer and the consumer.

The policy measures that are required to improve the poultry industry must involve: (a) improving infrastructure facilities, which will help not only to stabilize the price of poultry products in the domestic market, but also make them available in remote areas; (b) creating an efficient marketing channel that will help provide remunerative prices to producers (in other words, India's marketing set-up should also grow along professional lines).

Some of the approaches in this direction are –

- Development of reliable and stable market chain round the year for marketing of poultry products.
- Facilities for hygienic slaughter and preservation of eggs should be made available at market places in both urban and rural areas.
- Formation of producer co-operatives/ associations and rural market yards will help in proper marketing.
- However, more systematized marketing strategy and the state's involvement in minimizing the channels are required for making poultry farming remunerative and cost effective in the years to come.
- Because of the location of farms in urban and peri-urban areas that too concentrated in few states, availability of eggs and chicken meat are high in these areas only. But in rural areas and rest of the country the availability is low. Thus, there is a vast scope to tap the rural markets and remote areas of the country where availability is low.

For the same a high end integrated system must be present which acts as a DSS also.

Presently some of poultry industries have adopted modular approach for computerization, which does not fulfill competitive requirement of the industry. Information Technology is revolutionizing the way in which we live and work. It is changing all aspects of our life. The digital revolution has given to the mankind, the ability to treat information with mathematical precision to transmit it with very high accuracy and to manipulate it at will. Computers and Communication are becoming integral part of each and every industry.

One of the latest developments in the field of KM approach is IT enabled system, which is gaining success in many facets of corporate world.

In today's dynamic environment role of government has been increased to strengthen the rural economy. Government policies are more inclined towards alleviation of poverty. Since the olden times, India has been an agricultural country making it the largest source of employment and earnings for the majority of the population. Livestock forms a significant component of the agricultural enterprises. Indian Poultry Industry is 5,000 years old; recently it began to witness remarkable growth from backyard to poultry industry. Poultry Industry is providing nutritional security to the poor and also offering employment to millions of people in rural and urban areas.

In such environment, this paper proposes effective KM implementation for poultries in rural area. Scheduling system of poultry in rural area is unscientific and works on accumulated experience.

Problem Definition

Current database management and communication systems used for data about scheduling dates of chicken birth, growing period, maturation and egg delivery, imaturation for egg manufacturing and ready for meat manufacturing are based on rule of thumb which are not followed appropriately. These dates and related database of poultry is documented manually with the help of a clerk. This large database related to poultry complicates decision making process such as selection of first chicken breed and overall planning of poultry activities. As a result, scheduling becomes improper giving rise to whims and fancies for the mediators. This leads to corrupt malpractices and exploitation of the farmers. Overlapping of cutting dates and improper scheduling gives rise to large inventory of eggs and meat in poultry industry thereby generating loss of eggs meat due to improper scheduling and hence loss of money. This creates vicious cycle in which there is a financial loss to both the parties. Current poultry products transportation system is based on rule of thumb which leads to large transportation cost and time. Driver is manually instructed to go to a number of poultry field and pick the load. These drivers and collection manpower most of the time are illiterate or less educated. They have lack of information related to route connectivity of all poultry fields. This leads to huge time consumption and creates the chaos in drivers mind. This creates improper scheduling which develops inefficient and non uniform transportation system giving rise to increased fuel consumption and financial loss, additionally creating pollution in the environment.

The aforesaid practices lead to following disadvantages to poultry industries, farmers and society at large.

1. Decrease in poultry products production.
2. Mismanagement in domestic and cooperative poultry industries.
3. Large inventory of poultry products in leads to inefficient plant layout at collection centre
4. Inefficient utilization of labors and transport vehicles.

Method

With the help of knowledge gathered from government agencies along with on field survey for nonregistered poultry, a computerized network system will be built into each village. Database related to poultry such as egg producers, total egg production, no. of chickens (Hen & cock), their food, litter, inventory of eggs at different levels, meat etc. will be collected by the respective authorities in each village for both domestic and cooperative poultry industries. This database will be go to main server located at district headquarter, where data will be analyzed. The ITEKM model will calculate the surplus and deficit of eggs and all allied poultry products of each village and will properly schedule the transportation of the same.

Research Methodology

Most of the domestic and cooperative poultry industries in India are as old as 30 to 40 years. Over the period of time lot of technological changes and diversification have taken place. Most of the players in the industry have not maintained, modernized or expanded their plants. But a few of them like company act registered poultry industries have changed with the times and have pursued an agenda for reform. They have realized that the products and by-products of poultry can yield profits too. New diversified technology and low cost plant and process techniques have been invented and required to be implemented in poultry industry.

But to adopt technological diversification, old poultry need to be modernized. Lack of modernization affects egg storage and carrying capacity, recovery, losses of eggs, chickens, hens in process, fuel efficiency, stoppage etc. Information Technology enabled systems have brought transparency and efficiency in the network poultry organizations. This has been proved successfully by Indian Railway Online Reservation System. Similar to this an IT enabled system is required to be implemented in poultry industries. IT enabled system can be further enhanced by application of integrated knowledge management approach which will also act as a decision support system. To eliminate the disadvantages of current database management and communication systems in poultry industry, IKM model will be designed, which will act as an appropriate Decision Support System.

For IKM model one centralized computer integrated with GPS, uninterrupted power supply and IT literate operator is required in poultry industry. GPS will show the route connecting scattered poultry industry to desired collection centre market field. Computer system will deliver output in the form of printout containing desired route map which will consist of total distance to be travel, name of village and important location of pond, lake and river along with product quality specification and quantitative data etc.

Whenever a new driver with his transport vehicle is ready to go to a poultry field, operator at the computer system will give printout of the desired route connecting one poultry industry to other poultry industry. This will minimize confusion in drivers mind regarding quantity, type of product etc. and will save time and fuel. In this way IKM model will act as a DSS.

Apart from this the centralized data collection will be stored. All this information is about egg, chicken, meat, etc., which further is analyzed critically to get the result in various output forms. Some are like inventory stock with expiry date, requirement from each market place, routing to distribute the same, forecasting of product distribution and pricing, and many more. Thus very systematically product collection, storage and distribution will be done through one DSS and one network. Due to this much more time is saved and delivery with the optimization in collection – distribution system.

Acknowledgment

We are thankful to Dr. Rahul B. Hiremath, Dean SMHRD, Pune, who is working in Knowledge Management area for their valuable guidance. We are also thankful to the team from Solapur Municipal Poultry Farm for providing valuable information regarding the poultry industry.

Result

The rural scenario in India is undergoing a rapid change, from the traditional concept of farming as a subsistence activity into a vibrant, commercial, economic venture enabling the farmers to live in dignity & prosperity. For the same the proposed model will provide real time dynamic model which will give optimum schedule for egg & allied products collection of poultry network. The ITEKM model will help to strengthen the DSS by enabling higher authorities to make proper decision related to movement of eggs & other product from surplus to deficit areas. With increased income of egg producers their quality of life and the happiness index will increase. By minimizing the losses in the transportation system, fuel and process efficiency will improved. This will boost the egg production and will strengthen the financial system of country.

By the implementation of proposed IKM model with GPS as DSS, following advantages will be gained-

1. Transportation time and Idle time of vehicles as well of workers will be minimized.
2. By minimizing transportation time, fuel economy can be achieved.
3. Less wastage, loss of product which occurs earlier due to inventory related problem.
4. Improved communication increase the efficiency of domestic & cooperative poultry industry, act as DSS
5. KM tool as trouble shooting for every stage of poultry's regular activities.

Conclusion

In a growing competitive environment, all domestic and cooperative co-operative poultry industries are trying hard for increased profit, and smooth working system. An appropriate knowledge management approach in the form of IKM will minimize the transportation and inventory time, which will also act as DSS. IKM model will further be extended to all state co-operative poultry industries and gradually to entire nation. This will further enhance the poultry system in the country and decision support system (DSS) at higher levels. This IKM model will save fuel consumption and reduce carbon emission in the environment. This will not only generate more revenue but in addition will result into the enhanced brand image of domestic and co-operative poultry industry in the rural area. The future for Indian poultry Industry appears to be very favorable. The most conservative estimates predict a two- to three-fold increase in poultry production over the next ten or fifteen years.

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