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The Role of Technology Entrepreneurship towards Economic Growth: An Application of RFID in Livestock Sector of Pakistan

Dr. Ijaz A. Qureshi[1*] Ayesha Khan[2] Dr. Donna Schaeffer[3]
1. Professor and Dean, Faculty of Management Sciences, University of Lahore, 56400, Pakistan
2. MS Scholar, Department of Technology Management, International Islamic University Islamabad, Pakistan
3. Professor of Information Management, School of Business Administration, Marymount University, Virginia, USA

Abstract
Over the last three eras, technology entrepreneurship has turned into an essential driver of economic development. The interconnection between entrepreneurship and technology is valuable to distinguish the most applicable techniques for competitiveness in the business areas and supporting new ventures. In today's competitive environment, Technology entrepreneurship is considered to be an essential element by which an organization can accomplish maintainable development and solve confronting issues related to its processes. In fact, the technological entrepreneurial approach is predicted to add to feasible development and growth toward Knowledge economy. The expansion and diffusion of technology is an essential component which might influence the fate of any industry. In this modern era, one of the significant contribution of information and communication technology (ICT) in livestock sector is advancement of electronic labels for distinctive ID of animals by utilizing Radio frequency identification (RFID) chips, which are inexpensive, distinctive and tamperproof. Automatic identification of animal assists in enhancing the farm administration practices and prosperity of animals. The foremost goal of this paper is to familiarize the reader with the hypothetical lens of technology entrepreneurship approach with an emphasis on livestock sector of Pakistan. Therefore, this study is an endeavor to find out what opportunities Technological Entrepreneurship and particularly RFID offers to entrepreneurs to exploit current scientific and innovative knowledge to address market issues that will bring business achievement and economic growth by using the secondary data. This paper will first give an ephemeral introduction of technology and Entrepreneurship. Specifically, the relationship between technology and entrepreneurship is scrutinized. Additionally, it will address the issues confronted by livestock sector in Pakistan while executing RFID, thus emphasizing the shortcomings and deficiencies of the RFID in Pakistan. At last, detail argument shall be made on the role of technologies entrepreneurial and its overall impact on the economy growth.
Keywords: Technology, Entrepreneurs, Economic growth, Technology entrepreneurs, Livestock, Radio Frequency Identification (RFID).

1. Introduction

With the rapid progression of human civilization, Economic growth and development is the main focus of every country. Policy Makers are ceaselessly examining and creating methodologies to utilization of technological innovation in order to invigorate economic growth and development of the country (Sabir & Sabir, 2010). With the advancement of technology, Controversies relating to economic development have made conspicuous the idea of business enterprise. In recent times, it has been acknowledge that entrepreneurship (which is known as utilization of business opportunity) will bring new possibilities to create job opportunities and wealth reproduction (Gans & Stern, 2003), but it has some constraint in achieving quickened economic development that would empower a nation to contend in the wildernesses of worldwide rapid technological improvements. Subsequently, Policy makers, analysts and researchers are talking more enthusiasm for the advancement of technological entrepreneurship (Willie et al. 2011).

In recent decades, Technology entrepreneurship has turned out to be progressively vital for monetary development and growth. Today, this fact is clear that technology comprehensive businesses play an inexorably critical role in global trade (OECD 2001). Linking technology with entrepreneurship, this relationship has expanded the attention on technology-based entrepreneurship (Dahlstrand, 2007). Nowadays, entrepreneurs are seeking new ways to incorporate technology into their product and service to meet societal needs. Particularly, talking about livestock sector, Farmers are embracing numerous ways to ensure good cultivating practices (Lim & Koh, 2009).

With the advancement of existing technologies, entrepreneurs have recognized that conventional animal identification strategies can't bolster industry development that essentially rely upon rapid, comprehensive, and accurate traceability of animals (Tonsor and Schroeder, 2006). Furthermore, there was expanding pressure and need in the worldwide business sector for harmless, infection free, and value guaranteed nutrition (Hossain, 2014). So, the need of hour was to introduce a new technology that can change the traditional strategies of animal identification. For this purpose, at the end of nineteen century, unbelievable execution of radio frequency identification (RFID) enabled the farmers to trace animals comprehensively and

accurately (Voulodimos et al. 2010).

An accumulative number of organizations are investigating into RFID expecting that it can enhance and reform the approach they do business. Additionally, RFID offers more information stockpiling, correct readability and less working costs over conventional and other current advancements (Wamba and Chatfield, 2009). Moreover, RFID tags are less susceptible against climate circumstances. In particular, by utilizing an appropriate RFID framework, the spread of animal infection flare-ups can be constrained by distinguishing each conceivably influenced animals as fast as possible, which thusly confines animal's misfortunes and minimizes potential exchange damage. Consequently, RFID helps farmers to enhance their business practices and processes (Finkenzeller, 2004). RFID has been proclaimed as an innovation that can essentially enhance business forms and thusly improve organizational execution and aggressiveness (Wu et al., 2006). The purpose behind this study is to explore the role of technology entrepreneurship in improving the livestock sector of Pakistan using RFID.

2. Entrepreneurship, Technology and RFID

In order to explore the role of technology entrepreneurship towards economic growth it is important to first present the concept of technology and entrepreneurship.

2.1 Entrepreneurship

The idea of entrepreneurship has an extensive variety of implications. The term "*entrepreneur*" has emerged from a French term "entreprendre" meaning "to undertake". However, entrepreneur is a person who starts a new venture or takes risk on part of others usually between purchasers and suppliers (Bolton & Thompson 2000).

Richard Cantillon, a French economist introduced the word entrepreneur in the middle of 18th century. Afterwards, John Stuart Mill, Adam Smith and David Ricardo concisely explored the idea of entrepreneurship, underneath the area of "business management "(Bruyat & Julien, 2001). Marshall also assumed same like John Stuart Mill that the abilities are connected with entrepreneurship are very rare and very limited people can show them in a very high scale. Initially, John Stuart Mill emphasized on the importance of entrepreneurship in economic development. On the other hand in 1890, Alfred Marshall was the first to recognize entrepreneurship as significant features of production, in his well-known paper "Principles of Economics" (Hindle 2009).

Entrepreneurship has no universal theory but we can say it's a multi-dimensional event that cuts through other disciplines (Van Praag & Versloot, 2007). So, basically Entrepreneurship is the utilization of business knowledge through owning an isolated business. Hissich and Peters (2002) defines entrepreneurship as the process of generating something new by allocating the compulsory time and exertion, and expect to receive rewards of monetary and individual satisfaction and freedom. In the beginning of 20th century, Austrian economist Joseph Schumpeter viewed entrepreneurship as a force of "innovative destruction". His definition of entrepreneurship highlights innovation process, such as creating new products, new systems of Organization, new markets and new assembling techniques etc. (Balachandran & Sakthivelan, 2013). Enterprise is a crucial component for economic development as it establishes its major significance in diverse ways like;

- Recognizing and evaluating business opportunities;
- Making new or current firms more forceful;
- Motivating the economy towards development, job creation and enhancement of civilization.

2.2 Technology:

The term "Technology" has emerged from a Greek word "*techno-logia*", Techno means a skill and Logia means study. Thus, technology means methodical action of art or science. Technology has been defined by different researcher in early literature. Conferring to Kumar et. al (1999) technology comprises of two essential segments:

- A physical segment which includes tool, techniques, system and procedures;
- The knowledge segment which comprises of skilled labor, quality control, know how in management dependability and resourceful areas (Wahab, Rose, & Osman, 2012).

Recently, MasKus (2003) has widened the idea of technology, where he defines technology as the information important to accomplish a definite creation result from a specific method of processing selected contributions which comprise of production forms, intra-firm hierarchical structures, administration procedures, and advertising techniques or any of its blends. Bozeman (2000) suggests that technology is constantly associated with acquiring definite outcome, determining assured issues, finishing certain responsibilities by utilizing certain expertise, exploiting Knowledge and capitalizing resources. Tihanyi & Roath (2002) suggest that technology comprises of information that can't be effectively created and exchanged. In light of this controversy, technology is perceived as implicit knowledge or information known by one association. Lin (2003) proposes that technology is incorporated in individuals, materials, subjective and physical procedures, offices, machines and devices.

In 1970, the first seminar on "technology entrepreneurship" was taken place at Purdue University (Shane & Venkataraman, 2000). Technological entrepreneurship can also be invoked as technology based

entrepreneurship, which can be characterized as the allocating of new ventures by people or enterprises to accomplish innovative development. It can likewise be depicted as the commercialization of evolving technological disclosures or development (Hindle & Yencken, 2004).

Technological entrepreneurship is the procedure by which business visionaries collect hierarchical assets and specialized frameworks and techniques by entrepreneurial organizations to track opportunities (Shane and Venkataraman, 2003). Due to Technological entrepreneurship countries can become more productive and globally competitive by making full utilization of the Knowledge of science and innovation to meet market requirements (Nwafor, 2007). Technological development and scientific advancements are crucial for attaining global competitiveness and worth creation for the firm, but what make the change are the technology transformation and their commercial exploitations (Zhang, 2011).More particularly, techno-entrepreneurship comprises of an arrangement of practices and activities that motivate the business strategy and process which is dependent on technology concentrated business opportunities, distinguishing immense potential and noteworthy risk with the ultimate goal to abuse those opportunities for value creation (Lin, 2003).

After these considerations technology entrepreneurship perception is made of an entrepreneurial component and a management component (Gurău, Lasch, & Dana, 2015). Those two components makes together what is stated as technological entrepreneurship competences that is the ability to distinguish and abuse technological opportunities to create new upgraded items and to effectively commercialize them (Willie et al. 2011). Petti (2009) states as the technology entrepreneurship process from the acknowledgment or formation of potential business valuation of new disclosures. To summarize, the idea of technological entrepreneurship comprised of three parts, in particular entrepreneurial, environmental and managerial segments, and the principle of the technological entrepreneurship is considered an arrangement of cooperative actors involved with an arrangement of actions identified with product advancement, technology expansion and identification, business innovation and construction.

2.3 RFID

Now a day, RFID is one of the most revitalizing and rapid growing advances for expanding competences and enhancing productivity in many organizations (Roberts 2006). RFID is a common word used for technologies that utilize radio waves to naturally distinguish objects or individuals. The most well-known method of identification is to relate the RFID tag with an individual or object (Hun Lim & Koh, 2009). Initially the first RFID was produced for use in World War II because British wanted to identify their planes. In the mid of 1980, RFID was practically commercialized where it was utilized for tracing different items and regulate certain applications. In fact, these automatic identification frameworks were exceedingly compelling in assembling and other threatening situations where barcodes tags can't persist (Hossain, 2014). Ever since 1980, RFID has set up itself in an extensive variety of business sectors including administration, engineering, retailing, animals, remote exchanges, livestock, computerized vehicle frameworks etc. (Aguzzi et al., 2011). Following are basic components of RFID

- An RFID tag: Basically RFID tag store data and it consists of an integrated circuit and a receiving antenna exemplified together with help of appropriate covering.
- Tag reader: RFID tag reader comprises of a decoder to translate the data of tag and antenna. Antenna is utilized for diffusing and delivering electromagnetic waves conveying data from tag to reader and contrarily (Roberts 2006).
- A host system (Software): A host system utilizes to deal with the acknowledged data and processes of tag and reader.

There are basically three types of RFID (Roberts 2006) based on its *Read*/Write methods;

- Read-Write (RW tags)
- Read Only (RO tags)
- Write Once, Read Many (WORM tags)

Further, on basis of power source characteristics (Aguzzi et al. 2011), RFID tags can be separated into following major types;

- Passive tags don't have battery or own power resource rather than they are enacted when they approach a RFID reader. Readers send electromagnetic field that produces a current in the tags antenna which at that point powers the microchips circuits. These passive tags are low cost with unlimited life but have a much shorter reading range than active tag.
- Active tag communicates the data using its own power resource usually a battery. Because of this characteristic, Active tags are able to transmit strong signals to the reader at any time. Active tags have much longer reading range in comparison to passive tag and also provide read/write facilities. Active tags are more costly than passive tags due to implanted battery.
- Semi-passive tags have uses its own power resource usually a battery. Contrary to active tag, Semi-

passive tags communicate by using electromagnetic waves produced by reader and offer a wide range of readability (Chen 2008). Semi-passive tags have high price as compare to passive tag. Durability of tags is inclined by type of battery used like lithium and magnesium oxide, paper batteries and ultrafine batteries etc.

Through 2018, IDTechEx states (Figure1) that the trade market of RFID will reach up to $8 billion, depicting 27% of the entire marketplace.

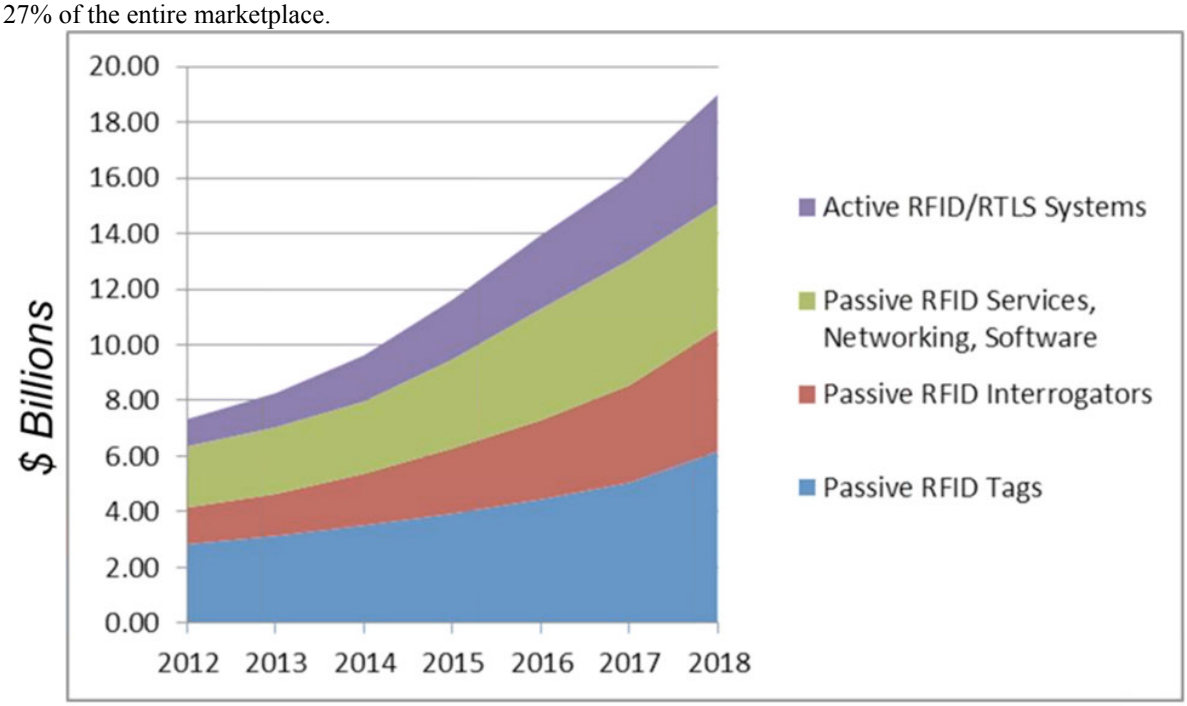

Figure 1: Total RFID Market Projections in billion U.S. dollars (Adopted from Harrop & Das 2015)

2.3.1 Communication frequencies range of RFID tags

RFID tags utilize various kinds of frequencies ranges for communication reason. Every frequency has particular benefits and drawbacks with respect to its abilities (Chen et al. 2008). Some of common RFID tags available in different frequency range are listed below (Table 1):

Table 1: Different frequency ranges of RFID (Adopted From: Ha & Schaumont 2007)

Frequency	**Appx. Read Range**	**Data Speed**	**Cost of Tags**	**Application**
Low Frequency (125kHz)	<5cm (passive)	Low	High	• Animal Identification • Access Control
High Frequency (13.56 Mhz)	10 cm – 1m (passive)	Low to Moderate	Medium to Low	• Smart Cards • Payment (pay wave)
Ultra High Frequency (433, 868-928 Mhz)	3m -7m (passive)	Moderate to High	Low	• Logistics and Supply Chain • Baggage Tracking
Microwave (2.45 & 5.8 Ghz)	10m -15m (passive) 20m – 40m (active)	High	High	• Electronic toll collection (Auto toll) • Container Tracking

2.3.2 Deriving the Economic Impact of RFID

RFID is not just a business approach but it's an empowering agent of various business systems. RFID innovation is revolutionizing and empowering technology and is thought to be the following influx of the IT transformation. Similarly like IT, RFID will cultivate advancement, financial development, and worldwide business. On the other hand, RFID innovation is still in its initial phase of arrangement (Schmitt & Michahelles, 2008). RFID is solution based approach which is driven by solution based value for the entire business process. RFID makes it possible to integrate these smart products/physical objects with an identifier directly into the digital world which offers an enormous potential for new and innovative concepts. RFID makes it conceivable to incorporate these savvy physical objects with an identifier straightforwardly into the digital world which suggests a tremendous potential for new and imaginative ideas.

The economic effect of RFID is constructed on following common suppositions:

- By connecting additional clients to a system, RFID will create more prominent system externalities.
- As RFID is new in numerous procedures it is simple to accomplish productivity enhancements in a brief timeframe.
- RFID propose the chance to totally overhaul procedures and not just to upgrade single errands and subsequently increasing more noteworthy productivity enhancements.

2.4 Role of livestock sector in the development of economic growth of Pakistan

Agriculture sector is an essential part in the economy of the nation and is at the heart of the country financial framework. Pakistan is an agriculture established economy, which has an abundant potential in livestock sector. Agriculture sector is considered to be the major provider to the Gross Domestic Product (GDP). Whereas, Livestock being sub-area of agriculture and represents 56.3% of agricultural worth expansion and around 11.8% of the Pakistan [Pakistan Economic Survey 2014-15]. Livestock sector of Pakistan offers employment to countless families and around 35 million individuals are occupied with livestock associated activities, grossing around 40% of their wage from it. Productivity increase in livestock will alternatively have a strong impact on incomes of rural poor farmers, moreover noteworthy constructive influence on over-all income in the livestock sector in addition to exports (Wasim, 2007). There is a need to encourage agribusiness industry in international market on the grounds that it assumes an essential part in economies of Pakistan. Livestock comprises of poultry, cows, horses, goat, buffalos, camel, asses, donkeys and sheep their products. Livestock sector plays a noteworthy part in developing the economies of nations. They provide a significant basis of nourishment and work for billions of urban & rural family units. With rapidly changing livestock production systems, policies, institution, frameworks, natural effects and demographics, this "multi usefulness of livestock" turns into a significantly more perplexing issue, interlaced with other innovative and development challenges (Abedullah, Khalid & Kouser, 2009).Figure 7shows the Gross value addition of livestock has improved from Rs. 756.3 billion (2013-14) to Rs. 776.5 billion (2014-15), presenting a growth of 2.7% as compared to last year.

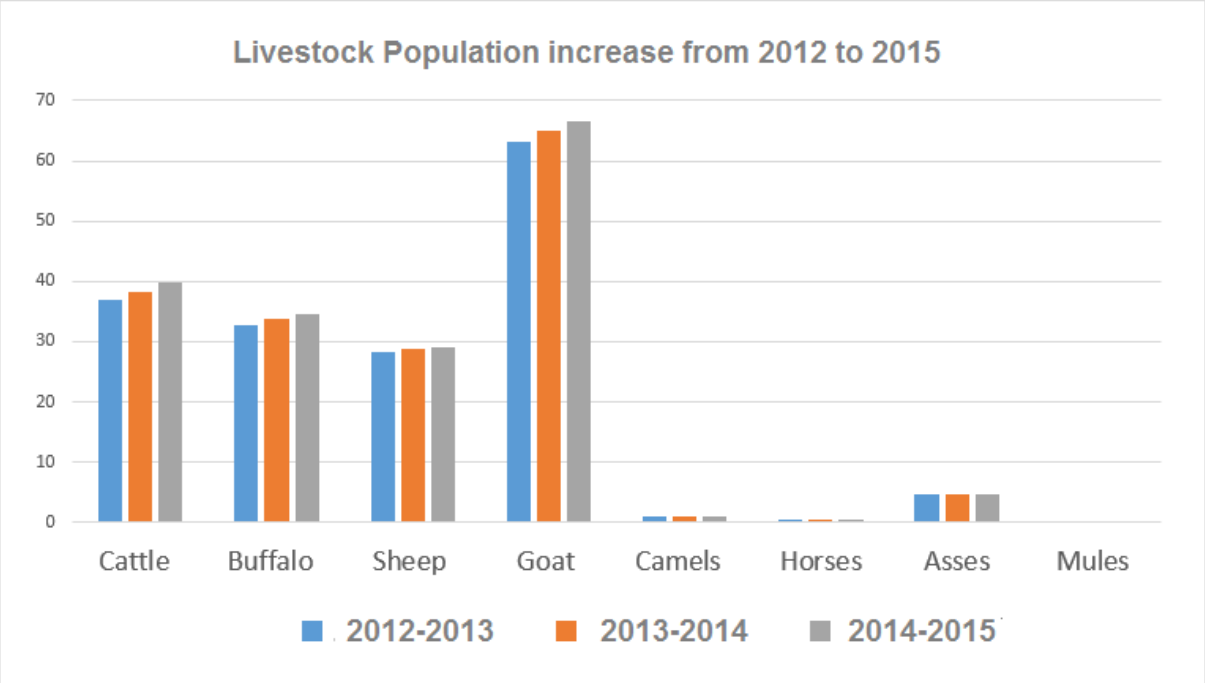

Figure 2: Livestock Population increase from 2012 to 2015(Adopted from: Economic survey of Pakistan 2014-2015)

Agriculture innovations demands that innovations that are financially savvy, operative, beneficial, attainable and most applicable to local situation must be familiarized on large scale, which will empower to make the livestock frameworks more economical and sustainable in the nation (Ali & Iqbal 2004). The demands for domestic animals are expanding due to urbanization and increment in per capita income. In order to increase the production of livestock sector in Pakistan there is a need to adopt modern methods and commercialization of new technologies must be increase substantially (Wasim, 2007). Technologies like RFID should be introduced in Pakistan to increase the production of domestic animals. As we know Pakistan is an agrarian country, but still the agricultural structure is backward. The need of the hour is to use modern techniques and better infrastructure to remove all those barriers of agriculture sector. According to economic survey of Pakistan 2014-2015, average growth of livestock sector was 2.9% but the target was not achieved (Figure 8).

2.5 Application of RFID technology in improving Livestock sector – solution to the problem

Recently at global level, animal identification techniques has become essential in livestock administration. Due to globalization, commerce has expanded the job of farmers for stalking, handling and overseeing creatures turns out to be

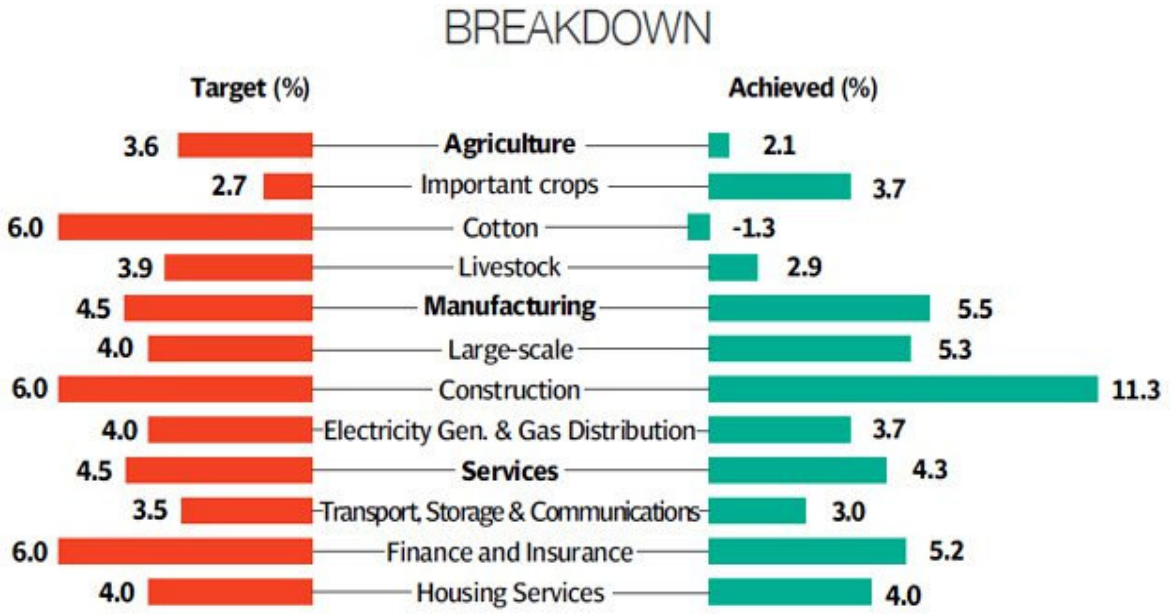

Figure 3. Sector wise growth statistics (Adopted From: Economic survey of Pakistan 2014-2015)

more risky and challenging. Animals can't be slanted and put in storage unlike other products. In the past, different conventional methods for identification have been used by farmers to track and record animals, for example paint marks ear labels and tattoos etc. But the traditional means of animal identification have lost its value due to increased human errors and technological advancements (Trevarthen, 2007). Many countries are adopting RFID technology for tracking and recording keeping of domesticated animals in order to attain global advantage (Samad, Murdeshwar & Hameed 2010). Implantable RFID tags can be utilized for animal identification which is usually passive tags. RFID framework can oversee animals better on the grounds that it is speedier, cleaner and less demanding than the ordinary frameworks. Utilization of RFID for livestock management results in decrease of work cost and expanding the profits. RFID frameworks are evaluated to deliver one error per each 1000 animals though conventional framework can present six mistakes for each 100 animals (Trevarthen, 2007). The uniqueness of RFID labels guarantees dependable and productive tracking of creature beginning from its birth to different phases of its life until the season of its butcher. The uniqueness of RFID technology can improve farm administration and stock administration (Kumari, Narsaiah, Grewal, & Anurag, 2015). On the other hand, rather than its unique identification system; RFID frameworks can incorporate comprehensive data of creature like development status, information of medicinal treatments and records of creature transportation etc. The inclusive report of animal's history can be shared with all the stakeholders like veterinarian, processor, stockman or agriculturist with the assistance of data base software (Curkendall, 2002).

List of Companies providing RFID based solutions for livestock in Pakistan are:

- TELECUBE
- RFID Pakistan
- CANOTECH Group
- Link Corporation
- VAST TECHNOLOGIES
- HE Technology
- ICILtek technology

Types of Tags Used For Animal Identification

There are three primary types of tags (Costa et al. 2013) infused under the skin of animal that are:

- Boluses
- Ear labels
- Injectable glass tags

2.6 RFID standards for animal identification

International Organization for Standardization (ISO) has built RFID standards for animal identification. ISO 11784, ISO 11785 and ISO 14223 are three types of ISO standards that control RFID of animals, which is generally done by inserting, presenting or joining a transponder comprising a microchip to an animal (Wamba & Chatfield 2009).

ID tag has to follow certain standards to be referred to as an Animal Identification Number (AIN) Opasjumruskit (2006) which are as follows;

- RFID tag must be labeled for one time use
- AIN number should be simply and constantly readable
- RFID tag must have affirmed 15 digit no.
- RFID tag must be placed in animals left ear
- RFID tag can't be promptly changed or damaged

3. Theoretical Framework

In recent decades, Technology entrepreneurship has turned out to be progressively vital for monetary development and growth. Due to Technological entrepreneurship countries can become more productive and globally competitive by making full utilization of the Knowledge of science and innovation to meet market requirements (Nwafor 2007). Technological development and scientific advancements are crucial for attaining global competitiveness and worth creation for the firm, but what make the change are the technology transformation and their commercial exploitations (Zhang 2011). More particularly, techno-entrepreneurship comprises of an arrangement of practices and activities that motivate the business strategy and process which is dependent on technology concentrated business opportunities, distinguishing immense potential and noteworthy risk with the ultimate goal to abuse those opportunities for value creation (Lin, W. B. 2003). To develop the theoretical framework for the contemporary study, theories of economic growth offers the essential grounds which says that the growth of economy is influenced by lot of variables like technology change, human capital and labor etc.. The growths of these technological advancements are the exogenous and endogenous growth that roots the economy towards growth. Human capital, R & D institutions and Technological innovation are concerned superlative variables that affect economic growth of the economy, but economic growth itself affects the significance of these variables. The description of endeavor variables and their theoretical influence are defined as follows:

3.1 Economic Growth

The term economic growth is interrelated with technological changes. Economic growth is directly related to per capita increase in GNP of the country. With the rapid progression of human civilization, Economic growth and development is the main focus of every country (Sabir & Sabir 2010). Policy Makers are ceaselessly examining and creating methodologies to utilization of technological innovation in order to invigorate economic growth and development of the country. Economic growth is dependent on lot of factors which may vary depending on the circumstance of each country.

3.2 Technological Innovation

Technology innovation plays a substantial role in stimulating economic growth and development which is further acknowledged by Economic theory. Bozeman, (2000) suggests that technology is constantly associated with acquiring definite outcome, determining assured issues, finishing certain responsibilities by utilizing certain expertise, exploiting Knowledge and capitalizing resources. Technological development and scientific advancements are crucial for attaining global competitiveness and worth creation for the firm, but what make the change are the technology transformation and their commercial exploitations (Zhang 2011). Thus, technology innovation has a direct and positive impact on economic growth.

3.3 Research & Development

Another factor that has a strong potential to influence the economic growth is the R&D research and innovation breakthroughs. R&D basically allows the flow of ideas and technologies which has reflective significances over numerous economic variables. Technology driven economies are pressuring organizations to produce associations with knowledge based institutions. In today's global economic development, R&D produces valuable returns in terms of economic growth and productivity (Křístková 2012). R&D institutions through partnerships and associations generate technological opportunities and facilitate progress towards economic growth particularly in enterprise productivity (Ulku 2004).Thus; R & D institute has a positive effect on economic growth.

3.4 Human capital

Knowledge that is embedded in people is usually referred as human capital. It includes factors like training, literacy, skill development and other dimensions that can boost their proficiency and competence (Khilji, Kakar & Subhan 2012).Various economists of growth theory have laid much emphasis on investment in human capital as a strong element of production and growth process. Particularly, developing economies must invest in human capital, as skilled work force can adjust easily to changing technologies which will lead to higher development rate of economy (Hanushek 2013).Therefore, human capital has positive impact on labor productivity which contributes to economic growth.

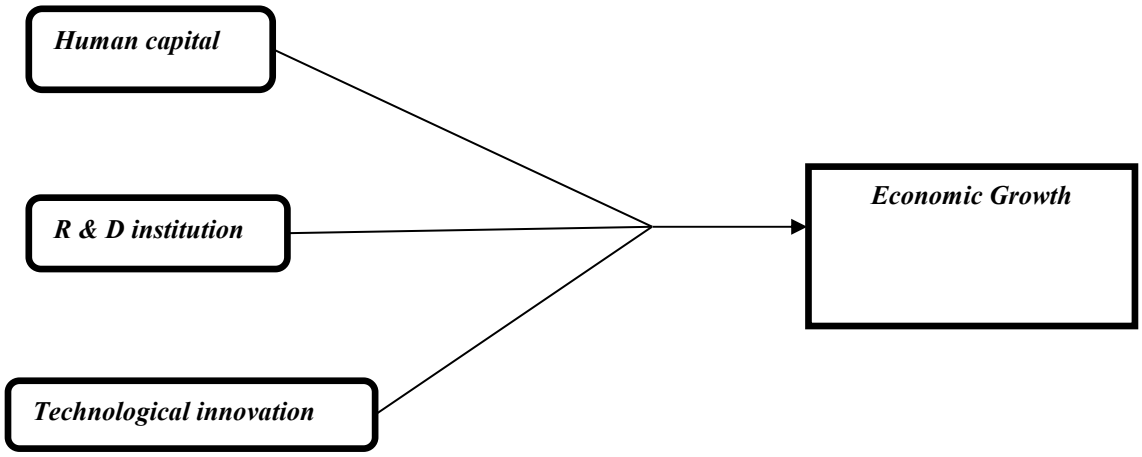

Figure 4. Conceptual Model: Impact of technology entrepreneurship towards economic growth

3.5 Research Methodology:

To examine the relationship between Technological entrepreneurship and economic growth this research paper is constructed on the secondary sources of data. Economic growth is dependent variable while technological innovation, R & D and human capital are independent variables of theoretical model. Secondary data concerns with the data accumulated from other's literature which facilitates with less consumption of time and less expensive to collect. It also provides deep vision for more formal research with the better understanding of the information. Collecting data by secondary modes provide better comparison for solving our own research problem with the existing literature (Daas & Arends 2009). It engenders new research concepts and permits liberated research which will directly benefits the young talented researchers without concern for the financial resources (Heaton, 2008).

Advantages of RFID in livestock industry of Pakistan

Specific advantages of using RFID technology (Ruhil et al. 2013) in livestock sector are as follows:

- Automatic and authentic tracking of animals
- Result in decrease of labor cost (cost effective)
- Enhance productivity and increase profits
- Automatic identification can additionally be connected to Bigger data bases and data handling interface for recording and preparing data
- Helps to control outbreak of different diseases
- Records behavior changes in animals
- Increases productivity in the catching particular information
- Reduced information blunders perusing labels and in data entry errors
- Instant capacity to produce instant reports
- It cannot be easily replicated, hence enhance the security of the product
- Helps in tracing stolen animals
- Tracing back of stolen/ strayed animal
- Productive traceability of animal from birth to slaughter
- Helps Settlement of protection cases
- Reduction in information section blunders

Challenges to RFID adoption in Livestock sector of Pakistan. Main challenges (Herani et al. 2007) identified with the execution of RFID in Pakistan are:

- Initial cost is increased like labor, equipment, maintenance etc.

- Lack of technology infrastructure and un-availability of IT devices
- Illiteracy of animal health workers in rural areas that is no special training of RFID implementation in animal's body
- RFID tags performance is influence by antenna patterns that might be disturbed due to environmental obstacles and tag alignments
- Disputes regarding of secrecy and confidentiality of information
- Frequency blocking may stop the whole RFID framework
- Equipment's and tags might not be up to ISO standard
- Some technical Challenges like collision & interference may disturb the whole process

4. Conclusion and Recommendation

Due to Technological entrepreneurship countries can become more productive and globally competitive by making full utilization of the Knowledge of science and innovation to meet market requirements. Technological development and scientific advancements are crucial for attaining global competitiveness and worth creation for the firm, but what make the change are the technology transformation and their commercial exploitations which leads entrepreneurs to transform new commerce models and approaches. In this new era, technological progression and scientific advancement has offered more choices accessible to entrepreneurs, expanding rivalry and putting weight on the execution of the individual firms and organizations inside of economies. The agronomic production in Pakistan is low because of use of conventional methods in agro industry, so the implementation of new technologies for the growth of agro industry and the advancement of provincial regions is essential. Technological progressions has extended the capacity of tagging everything, a cutting edge idea regularly alluded as the Internet of things has changed the way we live. With the advancement of existing technologies, entrepreneurs have recognized that conventional animal identification strategies can't bolster industry development that essentially rely upon rapid, comprehensive, and accurate traceability of animals. Human capital, R & D institutions and Technological innovation are concerned superlative variables that positively affect economic growth of the economy, but economic growth itself affects the significance of these variables. RFID innovation has expanded the productivity of the organizations with incredible adequacy and precision. It offered them some assistance with improving their operations complex, in a brief timeframe. Application of RFID would bring benefits to organizations as well as to customers. Once different limitations of RFID tags like absence of a worldwide standard, security issues, and the cost element are removed, it has the capability of altering the way we live. Nevertheless, RFID based frameworks won't not be financially practical for small and medium livestock ranchers unless there is extensive significant benefit for them. There is a need to encourage agribusiness industry in international market on the grounds that it assumes an essential part in economies of Pakistan. The need of the hour is to implement technology straight away without waiting for the cost to decrease down, in light of the fact that when we contrast the advantages of technology with the cost, significantly giving progressive ROI on RFID investment.

For better understanding the role of technology entrepreneurship towards economic growth the study should not limit to a specific country but other developing countries should also be added. This research only included the application of RFID on livestock sector of Pakistan so; other sectors and other technological techniques should also be included in the future research to find out their logical relationships towards economic growth.

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