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# TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP FROM THE WESTERN AND ISLAMIC PERSPECTIVES

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## ABSTRACT

Extant theories of economic development and strategic management emphasize innovation and entrepreneurship in generating business profits and sustaining the industry toward achieving economic prosperity of a society. However, this domain of knowledge does not explicitly address the issues of social development and well-being in relations to innovation and entrepreneurship in the industries. This can mean neglecting social and moral development in the pursuit of economic development. To remedy this gap, this study brings in the Islamic worldview – an all-encompassing values-based view of life that embraces just economic and social development. The objective of this study is to provide a framework that conceptualizes innovation and entrepreneurship from an Islamic perspective. This study first discusses the concept of innovation and entrepreneurship from extant literature and then examines the concept from the Islamic perspective. In Islam, all conducts by members of organizations, including innovators and entrepreneurs, are tied to superordinate goals and conducted in accordance to the *shariah* and Islamic

ethical standards as prescribed in the *Qur'ân* and *Hadith*. Such Islamic ethical dimensions, among others, emphasize the importance of *akhlaq* (good manners) of entrepreneur-managers, and their responsibility toward the well-being of the organization's internal system as well as the society. All conducts when carried out earnestly (*ikhlas* with *ihsan*) form one's *ibadah*, which are the acts of worshipping Allah. The conceptualization of Islamic perspective on innovation and entrepreneurship process supports the efforts of inventors and entrepreneur-managers to achieve worldly economic benefits that would ultimately enable them to attain the blessings of Allah (*mardhatillah)*. Such superordinate orientations and value system, which address the issues of intentions and corresponding actions, enable the conduct of values-based innovation and entrepreneurship that achieve a balanced economic, social, and moral development. This perspective remedies the theoretical gaps and solves managerial problems that demand values-based endeavours in innovation and entrepreneurship.

JEL Classification: L26, M00, O32, O33, Z12

Key words: Technological innovation, Entrepreneurship, Islamic perspective, Islamic ethics, Well-being

## 1. INTRODUCTION

Theories of economic development and strategic management emphasize the need for firms to be innovative. In fact, one of the most important assumptions is that innovating (which is equated to strategizing) through the act of entrepreneuring (the ability to recognize new opportunities and exploit them into something that benefit users while generating profit for the firms) could lead to high growth of firms. This perspective stresses the significance of innovation not only in generating profits for particular firms within an industry, but also in sustaining the whole industry in the long-run. It also suggests that firms' high growth helps promote economic development in a society, thus benefiting both the consumers and businesses (Jacobson, 1992; Schumpeter, 1934; 1942). These discussions, however, are lacking in regard to addressing the issues of social development and well-being in relation to economic development brought about by innovation and entrepreneurship in

industries. This critical omission can have important consequences on the social and moral development of the societies, in which the innovation and entrepreneurship occurs. Harmful innovations and large waste are some of the examples of values-less or values-free exploitation of science and technology. In addressing these issues, values-based principles, such as the Islamic worldview, with its all encompassing view of life that covers among others, just economic and social development, provides a more comprehensive perspective on innovation and entrepreneurship. Understanding of this concept can lead to the development of solutions that promote socio-economic development congruence.

From the Islamic perspective, the purpose of man's existence is to perform religious duties (*ibadah*) and to serve as a vicegerent on earth (*Qur'ân*, 2:30). Performing these two functions helps man to achieve his ultimate goal, which is *mardhatillah* – Allah's pleasure and blessings (*Qur'ân*, 2:265). To achieve *mardhatillah*, a person must follow the *shariah* (which prescribes regulations for all aspects of conduct for Muslims) and Islamic code of ethics unconditionally, and direct his actions earnestly (with *ikhlas*) toward achieving perfection (with *ihsan*). The primary source of the *shariah* and Islamic ethics is the *Qur'ân*–the sacred writings of Allah's divine revelation that were revealed to the Prophet Muhammad (p.b.u.h.), and *Hadith*–the practice and sayings of Prophet Muhamad (p.b.u.h.). The concept of Islamic ethics generally emphasizes on *akhlaq* (morality or manners) and intention as well as the responsibilities toward the well-being of the society.

Moreover, performing one's duties as a *khalifah* (caliph) involves explicitly encouraging others toward acknowledging the oneness of Allah which is referred as *tawhid* (*Qur'ân*, 51:56; *Qur'ân*, 2:30). *Tawhid* is the doctrine of oneness of God, which declares absolute monotheism of man to his Creator (Oxford Islamic Studies, 2010). According to Islamic teachings, men have a super-ordinate goal in life which transcends the life in this world. Islam does not view virtuous deeds done for life in this world to be different from those performed for life in the hereafter as all noble actions of a person are considered as religious duties. This is stated in the *Qur'ân*:

> "Say: "Truly, my prayer and my service of sacrifice, my life and my death, are (all for Allah, the Cherisher of the Worlds."(*Qur'ân*, 6:162).

Therefore, the conducts of innovation and entrepreneurship based on the Islamic teachings are bounded by the *shariah* and Islamic ethics, to enable their inventors, entrepreneurs and managers to fulfil their religious duties, and achieve *mardhatillah*, as stated in the *Qur'ân*:

> "O ye who believe! Obey Allah and obey the Messenger and those charged with authority among you. If ye differ in anything among yourselves, refer it to Allah and His Messenger if ye do believe in Allah and the Last Day: that is best, and most suitable for final determination" (*Qur'ân*, 4:59).

Islamic values of super-ordinate goal and guided value system can serve as the basis for the development of solutions that promote socio-economic development congruence. The objective of this study is to provide a framework that conceptualizes innovation and entrepreneurship from the Islamic perspective. This study focuses on firms as its level of analysis. The discussion is centred on the process of innovation and entrepreneurship that occur within a firm and those that concern the firm's competitive environment. The macro-economic aspects of a firm and its environment, however, are beyond the scope of this study. The underlying theories concerning this study are process theories of innovation and entrepreneurship, as well as theories of firm competition, which include Industrial-Organization perspective, Resource-based view, and Schumpeterian perspective.

This article is divided into several sections. First, it discusses the concept of innovation and entrepreneurship from the extant literature. It focuses on the process of technological innovation, which is referred to as the process of transforming creative ideas involving scientific and technical domains into usable products for targeted customers. Next, the article explains the processes of technological innovation and entrepreneurship from the Islamic perspective. It analyses the texts of the *Qur'ân* and *Hadith*, their *tafsir* – the authentic interpretations by

various scholars (for example, Sayyid Qutb, 2000a; 2000b; 2000c; 2000d; 2000e; 2000f; 2000i; 2000j; 2000k; Yusuf Ali, 1934; Mahmud Yunus, 1973), as well as other scholarly books and articles. It then suggests an Islamic perspective of technological innovation and entrepreneurship.

## 2. TECHNOLOGICAL INNOVATION PROCESS

Innovation is defined as "any product, service, or system perceived as new by its adopters" (Dewar and Dutton, 1986) and "a concept, procedure, or entity that is viewed as new by an individual or unit of adoption" (Rogers, 1995). However, it is also described by others as the *act of introducing something new*, such as new ideas, techniques or strategies (Tornatzky, Eveland and Fleischer, 1990). These writers explicitly suggest that innovation is a continuum which begins with innovative creation, to adoption and diffusion. In parallel, innovation is defined as "successful transformation of creative ideas into practical realities" (Stevens Institute of Technology, 2008), while Vuarin and Rodriguez (1994) define it as, "doing something which did not exist before in a particular territory or technical area". Thus, generally the term innovation carries two meanings, one is the *outcome* of an innovative process, which is *the new product*, and the other is the *process* of generating the new product.

When an innovation involves the embodiment of knowledge of scientific and technical domains, the outcome is called a technological innovation (Tornatzky, Eveland and Fleischer, 1990). Technological innovation can be categorized into *products*, *processes*, and *administrative* innovations. Technological *product* innovations include the development and introduction of new offerings (products or services) or modification of the firm's existing offerings (Romano, 1990). Technological *process* innovations, on the other hand, involve the development and introduction of new systems or processes, or modifications of existing systems or processes of doing works and accomplishing tasks within firms – the 'how' of developing and offering firms' products and services (Damanpour, Szabat and Evan, 1989).

Technological *administrative* innovations refer to the integration of new technologies into the administrative domains of organizations, such as in their structures and administrative practices (Dalton, Barnes and Zaleznik, 1973; Damanpour, 1987). Such innovations usually have significant impact on organizations' operations and work processes (Kimberly and Evanisko, 1981). Technological innovation, in the form of products, techniques, physical equipment, or systems, typically creates changes within the firm. New technological products could also affect the customers using them, as well as members of society and the environment in which they are adopted (Schon, 1967).

Within the categories of product, process or administrative innovations, technological innovations can be further classified according to the types of change they bring to the organizations that create and develop them. Generally, radical innovations result in major transformations in the business processes of an organization or even the industry. Therefore, such innovations often cause considerable uncertainties on the part of the organization as well as the industry (Tushman and Anderson, 1986). On the other hand, incremental innovations bring about minor changes in the current business practices and they generally serve to strengthen an organization's existing capabilities, rather than creating new ones (Dewar and Dutton, 1986). The term incremental innovations also refer to modifications or improvements of firm's existing products or services. Such changes usually entail little or no changes to the process of making and delivering the firms' products or services.

As shown in Figure 1, the focus of this study is on the technological (product) innovation. The foundation of its creation lies in the embodiment of scientific knowledge and appropriate R&D conduct to reach commercialization. Such a development path provides interesting debates on the entire innovation process (Tornatzky, Eveland and Fleischer, 1990). Figure 1 shows that the process of technological innovation is categorized into several major activities, which include scientific research, engineering R&D, product development, product manufacturing, and product launching. They are usually performed by more than one organization and could span over many years (Bright, 1969 cited in Martin, 1994). Scientific research concerns with principles and nature of matter, while engineering R&D or applied science relates

directly to problem solving. The former aims at seeking the truth or the science of matter, while the latter strives to achieve the utility of science. Scientific research within a technical domain is typically conducted in academic research labs and usually leads to academic research publications. The results of the scientific research are then undertaken by either an engineering faculty or a technology developer within a division of a university or a private firm that supports the development work. Further development effort would perhaps be conducted in another firm by utilizing the results from the previous research, and thus, typically the activities are performed across many different firms. Finally, the product is manufactured and launched to the targeted customers (Tornatzky, Eveland and Fleischer, 1990; Wiarda et al., 1990).

Figure 1 shows the conceptualization of innovation as a linear-phased process which progresses from one phase to another until the innovation is ready to be launched; in reality it is an iterative process. For example, the creation of a new product might begin in R&D development phase, with the R&D development stimulating the search for appropriate scientific knowledge; or the conception of a product that occurs in a firm triggers the search for the scientific knowledge and appropriate R&D conduct that would be able to support the development of the concept (Tornatzky, Eveland and Fleischer, 1990). This suggests the haphazard nature of a technological innovation process. However, within the process, certain stages need to be reached before others. For example, mass product manufacturing is only feasible after the full conceptualization of a product. Regardless, for a technological innovation to reach the commercialization phase, it has to go through all the phases (Bright, 1969 cited in Martin, 1994; Tornatzky, Grey and Gidley, 1990; Wiarda et al., 1990, Martin, 1994).

It is important to note that innovation process does not end with the commercialization stage as the product typically continues to be modified and improved after it is launched. This adaptation proceeds until the technology reaches the obsolescence stage and is replaced by a newer and more superior technology (Martin, 1994). Moreover, in this study, the conceptualization of technological innovation only focuses on product innovation, and does not include technological service.

## 3. TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP PROCESSES

Entrepreneurship can be defined as the process of recognizing a business opportunity and developing it into a product or service. Specifically, it is concerned with the discovery of the *sources* of opportunities, the carrying out of the *processes* of this discovery, the evaluation/exploitation of the opportunities and the commercialization of the opportunities into a marketable product/service by *individuals*, and their gathering of premium profitability from the commercialized product/service (Timmons, 1994; Shane and Venkataraman, 2000).

Entrepreneurship conceptually begins when a product/service is 'invented' (Martin, 1994). In fact, it receives the most attention during the stage when an invention is turned into an innovation. In practice, however, some forms of entrepreneurship occur throughout the innovation process, as shown in Figure 1. For example, recognizing opportunities and exploiting resources are parts of activities involving scientific discovery and R&D. While tinkering with a product design (in the discovery stage), an inventor might notice an opportunity to exploit existing resources, take the development further or obtain funding, which could help him produce the research output (in the commercialization stage). This discovery of opportunities and the belief that the rewards derived from conducting the research (which is the researcher's entrepreneurial profit) are greater than its costs, leads to actions.

However, what differentiates entrepreneurship during the scientific research and R&D phases from that of the actual undertaking in bringing an invention into the marketplace is the orientation of entrepreneur toward premium profitability. An entrepreneur seizes the opportunity to develop an invention further when he believes the development is feasible (he has the necessary resources), and out of this effort, he could reap profit above and beyond that of his effort with a high degree of certainty (Shane and Ventakaraman, 2000). In this regard, an opportunity could be an outcome or it could be embedded in the process itself. As an invention is pushed further toward commercialization, it requires more entrepreneurial efforts to help it gain recognition and be developed

further. This would enable it to qualify as an innovation and allow its inventors to achieve their premium profitability aim. However, this pursuit requires a substantial physical work as well as mental capabilities in support of the high knowledge-intensive effort. In reaching commercialization, a combination of scientific/R&D capabilities and industry knowledge is usually required (Alvarez and Barney, 2002; Kirzner, 1973).

Extant literature reveals that the entrepreneurship process leading to a technological innovation could be explained in several approaches: as a process of matching one's attributes to entrepreneurial tasks (*person-entrepreneur-fit view*); as a process of cognitive reasoning, that centres mainly on entrepreneur alertness (*cognitive perspective*); as a contextually-structurating process (*structuration view*); and as a process that develops through firm resources and capabilities (*resource-based view*). Person-entrepreneur-fit view suggests that a high match of a person's attributes to the demand of entrepreneur's tasks, indicate a high possibility of him being successful at entrepreneuring (Markman and Baron, 2003). Rather than treating entrepreneurial characteristics as "permanent" attributes, some suggest that entrepreneurship is a transitory process. Therefore, a person's response to a particular "opportunistic" situation defines his entrepreneurial behaviour, rather than his normal behaviour or typical character. In this regard, entrepreneurship is concerned more with the response of an entrepreneur (Shane and Venkataraman, 2000). On the other hand, the cognitive approach suggests the importance of entrepreneurial alertness, which is influenced by the entrepreneur's character, social network and prior knowledge in leading toward the recognition and full exploitation of an opportunity (Ardichvili, Cardozo and Ray, 2003). Moreover, one's nature of reasoning has a bearing in influencing whether he/she will recognize new opportunities. Among others, this perspective suggests that in comparison to non-entrepreneurs, entrepreneurs have greater imagination on what might have been; are influenced by their current affective state on decisions and judgment; have higher tendency to attribute their success to internal causes; have stronger tendency to overestimate their capability; and have higher tendency to justify their previous decisions (Baron, 1998).

The structuration perspective, on the other hand, suggests that business opportunity and entrepreneurship co-exist. According to this view, recognition and exploitation of opportunity occur through the entrepreneur himself constructing his own opportunistic environment. This explains why only a small number of people in the same group, despite being exposed to similar information, recognize an opportunity, and even fewer go out and exploit it (Shane and Venkataraman, 2000; Sarason, Dean and Dillard, 2006). Finally, the resource-based perspective highlights the central function of firms serving as platforms in facilitating innovation processes, particularly one that is developed within the scientific and technical domain, as in the case of technological innovation. This is because, often such innovation requires an entrepreneur integrating diverse knowledge of the market and the specialized knowledge of his development/management team in the firm in developing the new product, as well as making the appropriate decisions on the targeted customers and the timing for entry into the market(Alvarez and Barney, 2002; Kirzner, 1973).

At the economic level of analysis, entrepreneurship and innovation (revolutionary) disrupt the equilibrium of the existing state of economies, and bring about technological changes, which trigger a new cycle of economic activity (Schumpeter, 1934). In summary, entrepreneurship and innovation are closely linked concepts, as it is the entrepreneur who brings and facilitates commercialization of technical invention in the market. Therefore, understanding entrepreneurship is important when trying to comprehend innovation process. Entrepreneurship process is shaped by an entrepreneur's person-fit, cognitive reasoning and alertness, ability to structure himself with his environment and firm resources. Next, we bring in the discussion on technology deployment, which is the domain of the entrepreneurship process.

## 4. TECHNOLOGY DEPLOYMENT PROCESS (PRODUCT DEVELOPMENT, PRODUCTION AND LAUNCHING)

Technology deployment is a phase within the innovation process that concerns with the further refinement of a technological idea to achieve the utility required by users. As shown in Figure 1, it involves developing

the idea, manufacturing the final design, and launching it as a product. This is also a phase where the entrepreneur plays his most significant role and this role is prevalent irrespective of the firm's size. An important consideration in this phase is the existence of *pro-innovation bias*, in which technology developers believe that technology is vital to people, regardless what the latter thinks. Therefore, the central aim of technology deployment phase is to achieve mutuality of innovation perceived usefulness between the developers and their ultimate targeted user groups. To support this process, a high level of communication and understanding between developers and potential users is required. The developers must take into consideration the users' decision making process and how they would utilize the developed technology within their contexts (Eveland and Tornatzky, 1990). Another important issue is that the value proposition of a particular technological innovation is usually linked to other related technologies. Therefore, a new technological proposition that enables all parties (other technology suppliers, developers/deployers, aggregators, distributors) in the value chain to have opportunities to make profit will enhance its acceptance (Ratliff, 2002). This suggests the importance of achieving mutuality on the producers' side as well.

The technology deployment process could be discussed from several perspectives: resource-based perspective; social interaction view; diffusion theory; and context-based approach. As mentioned earlier, the resource-based perspective suggests the importance of an entrepreneur in ensuring commercialization through his capability in knowledge integration (Alvarez and Barney, 2002; Kirzner, 1973). Social interactionists, on the other hand, view technology deployments as communication processes amongst those involved in innovating and those who utilize the innovation. These processes are described by two models: centre-periphery and network-type. The latter is more appropriate for a high technology product as the need for users to provide input and be educated about the technology is higher, and the level of need for users to "reinvent" or modify the technology to meet their specific purpose is greater (Eveland and Tornatzky, 1990).

Diffusion theory suggests that the interaction of a new technology vis-à-vis an existing one, and the structural characteristics of the adopter, could have an important bearing on its acceptance. This theory also

suggests classifying targeted users by highlighting their characteristics in terms of their possible response toward a new technology (Rogers, 1995). However, technological innovations may also consist of complex technologies and their creations involve many decision makers and could transcend organizational boundaries. The context-based approach, on the other hand, overcomes some of these issues by suggesting the inclusion of several other important technology deployment variables, such as the nature of the new technology itself, the characteristics of its adopters, the required communication and transaction mechanisms, the boundaries between adopters and end-users, as well as the dimensions of uncertainty and the scope of the technology deployment (Eveland and Tornatzky, 1990).

Therefore, for many technologies, obtaining customers' feedback during important milestones of their development process is crucial to ensure the success of commercialization–introducing and marketing the new technological product, which is the final stage of the technology deployment process. Figure 1 shows that the transaction between technology developers/deployers and customers is highly interactive, as some initial sales may have already occurred during the earlier parts of the technology deployment process (Eveland and Tornatzky, 1990; DePietro, Wiarda and Fleischer, 1990). Figure 1 also shows that the acceptance of new technology by customers indicates its successful sale. Besides marketing and selling the technologies, firms could also pursue technology commercialization through spinning out a new venture, licensing the technologies or selling them outright (Martin, 1994). Next we will discuss the relations between innovation and entrepreneurship with firm growth and economic development.

## 5. INNOVATION, ENTREPRENEURSHIP, FIRM GROWTH AND ECONOMIC DEVELOPMENT

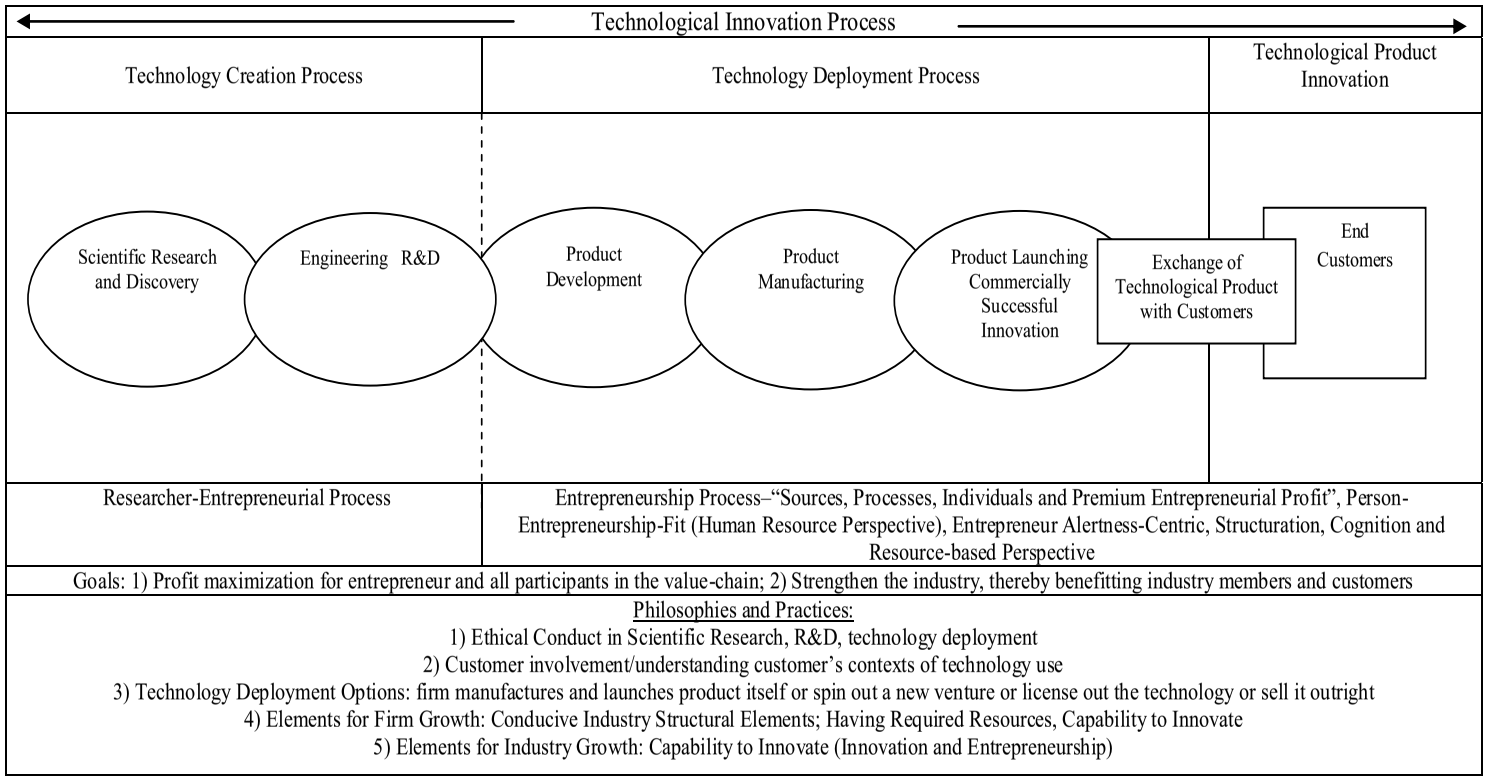
Innovation, firm growth and economic development could be discussed through the literature on business strategy. The literature emphasizes firms having supportive industry structure, internal resources availability, and innovative products or business activities as approaches to gain marketplace advantages and long term business sustainability (Barney,

1986; Jacobson, 1992; Porter, 2008; Grunert and Hildebrandt, 2004). The *industrial organization* perspective proposes the need to understand the characteristics of industry structure. This would enable a firm to manipulate structural elements of its industry to help it attain profitability and sustainability in business. The *resource-based* view emphasizes the firm's unique and internally-owned resources as a requirement to achieve a competitive advantage (Barney, 1991; 2001). The *Schumpeterian strategy* perspective, on the other hand, highlights innovations not only as a source of profit for members within an industry, but also of sustaining the whole industry in the long-run (Jacobson, 1992). Barney (1986) argues that an integrated perspective of the three theoretical streams would provide a greater explanatory power in describing firms' competitive situation. This means that in order to survive and sustain in the industry, firms need all three dimensions of conducive structural elements, necessary resources, as well as innovations and capability to innovate.

For the third dimension of firms' growth, theories of innovation and entrepreneurship focus on the importance of organizations' innovativeness. In fact, innovating is equated to strategizing, and it is achieved through the act of entrepreneuring (recognizing new opportunities and exploiting them to obtain something that benefit users while bringing in profits for the firm). This capability to innovate could lead to high growth of firms and rapid development of industries (Jacobson, 1992). In turn, high growth of firms and industries that help promote economic development in a society would benefit both the consumers and businesses (Jacobson, 1992; Schumpeter, 1934; 1942). The importance of successful innovations in contributing toward firms' growth is also emphasized in the resource-based theories of entrepreneurship (Alvarez and Barney, 2002; Newbert, Gopalakrishnan and Kirchhoff, 2008).

Figure 1 shows the overall conceptualization of technological innovation and entrepreneurship process which incorporates firm development and industry growth perspectives from extant literature. The following sections discuss pertinent Islamic concepts and explain the Islamic perspective to technological innovation and entrepreneurship.

FIGURE 1
Conventional Perspective Regarding Technological Innovation and Entrepreneurship Process




Sources: Shane and Venkataraman (2000); Martin (1994); Bright (1969) cited in Martin (1994); Schumpeter (1934; 1942); Baron (1998); Markman and Baron (2003); Sarason, Dean and Dillard (2006); Jacobson (1992); Tornatzky and Fleischer (1990).
Note: The dashed line divides the activities of technology creation and technology deployment, within the innovation process.

## 6. THE ISLAMIC PERSPECTIVE OF TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP

This discussion starts with the Islamic concepts of science, scientific research and discovery that are based on the *Qur'ân*. It then proceeds to examine six important Islamic methodologies which are the sources of creativity and innovativeness. It also explains how these precepts relate to the phases of the innovation process, which include scientific discovery, engineering R&D through to product launching. The discussion further addresses the Islamic aspects of resource provision and exploitation, and how they relate to innovation and entrepreneurship. It continues by examining the relationships between innovation and entrepreneurship with *shariah*-based transactions or dealings (*muamalah*). Finally, it deliberates on the Islamic concepts of technology deployment and production, as well as the relations of innovation and entrepreneurship to economic development.

### 6.1 THE ISLAMIC CONCEPT OF SCIENCE, SCIENTIFIC RESEARCH AND DISCOVERY

Islam provides instructions regarding conducting research and promises rewards for such activities (Sadeq, 1990, p. 28). The *Qur'ân*, in *surah* Al-Jumuah-62:10, commands people to "seek of the bounty of Allah (s.w.t.)". Sadeq (1990) explains that this implies 'search and research', which correspond with R&D activities and are important in the process of technological innovation (p. 28).

> "And when the Prayer is finished, then may ye disperse through the land, and seek of the Bounty of Allah: and celebrate the Praises of Allah often (and without stint): that ye may prosper" (*Qur'ân,* 62:10).

Therefore, innovation precepts are within the context of obeying Allah (Surah Al-Jumuah-62:10). This indicates that the act of innovating is an *ibadah*. Moreover, Islam requires that research must be conducted

to explore and create appropriate solutions (See Sadeq, 1990). Specifically, the *Qur'ân* explains the provision of iron, a tough metal which man could utilized in many different ways. Allah has also bestowed mankind with the physical and intellectual (*'aql*) abilities which would enable them to take advantage of this resource:

> "We sent a foretime our messengers with Clear Signs and sent down with them the Book and the Balance (of Right and Wrong), that men may stand forth in justice; and We sent down Iron, in which is (material for) mighty war, as well as many benefits for mankind, that Allah may test who it is that will help unseen, Him and His messengers; for Allah is Full of Strength exalted in Might (And able to enforce His will)" (*Qur'ân*, 57:25).

*Surah*Al-Hadid-57:25mentions that Allah is Strong and Almighty (See Mahmud Yunus, 1973; Sayyid Qutb, 2000i, on Surah Al-Hadid-57:25), thus indicating that the process of exploration and exploitation is directly linked to the concept of *tawhid*, which brings man closer to Allah.

The *Qur'ân* also specifically commands man to explore science and discover knowledge, as in these two verses:

> "Do they not look at the Camels, how they are made? And at the Sky, how it is raised high? And at the Mountains How they are fixed firm? And at the Earth, how it is spread out?" (*Qur'ân*, 88:17-20).

> "Behold! in the creation of the heavens and the earth, and the alternation of Night and Day ¯ there are indeed Signs for men of understanding. Men who celebrate the praises of Allah standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (with the thought): "Our Lord! not for naught hast Thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire"(*Qur'ân*, 3: 190-191).

In *surah* Al-Ghashiya-88:17-20, Allah instructs mankind to ponder His creations and to search and acquire knowledge about animals, astronomy, and geography (See Mahmud Yunus, 1973). While in verses of Ali Imran-3:190-191, Allah orders man to learn from His creation of nature, to use it as evidence of His existence, to be aware of the truth (knowledge about Allah and man's function and relationship to Him) and to acknowledge Allah's power and greatness. The inclusion of the *tawhidic* dimension (acknowledging the oneness of Allah) indicates the importance of strengthening the faith in Allah when exploring and discovering knowledge (See Sayyid Qutb, 2000c on Surah Ali Imran-3: 190-194).

In general, scientific knowledge is defined as knowledge which has been objectively proven through systematic investigation, and this scientifically proven knowledge is a major source of knowledge for Western scientists and innovators. In Islam, as mentioned in the earlier part of *surah* Al-Hadid-25:57, Allah explains the revelation of the *Qur'ân* to mankind as a source of reference (also mentioned in verses of Al-Jathiya-45: 20; Sod-38:29; and An-Nahl-16**:**89). Therefore, in Islam, the Quran is the major source of knowledge (See *Al-Qur'an dan Terjemahnya*, 1991 and Mohamed Aslam, 1997). Verse An-Nahl-16:89 specifically explains that the *Qur'ân* was revealed to Prophet Muhammad (p.b.u.h.) to explain *tawhid* and to provide guidance regarding all matters necessary for man (See Mahmud Yunus, 1973). This not only emphasizes the *Qur'ân* as a major source of reference, but also *tawhid* as the core of the guided knowledge. Islam considers all things, including knowledge, as coming from Allah. Therefore, while man may conduct experiments that generate scientifically proven knowledge, the source of this knowledge is from Allah, as only Allah has the power to grant knowledge to man (See Danial, 2010; Sayyid Qutb, 2000a on *surah* Al-Baqarah-2:164).

In Islam, knowledge gathering process involves four main stages. First, there is a need to identify the revealed knowledge of the *Qur'ân* and the *Hadith*. The next stage consists of systematically analyzing and categorizing this revealed knowledge into principles, ideas and concepts. Later, deliberation and comparison between this Islamic perspective with existing Western theories are carried out. Finally, the

knowledge derived from these efforts are to be rectified by linking it to the revelation (Mohamed Aslam, 1997).

Moreover, all scientific exploration from the Islamic point of view conforms to the *tawhidic* perspective (e.g. Surah Yunus-10:101; Al-Baqarah-2:164). This is one major difference between the Islamic and Western perspectives. Islam prescribes the *Qur'ân* as the main source of reference for scientific knowledge, and the pursuit of this knowledge brings man closer to Allah. This, thus, makes innovativeness a purposeful pursuit; all innovative behaviours in Islam are directed toward the ultimate aim of acknowledging Allah as the only God served by man. Another differentiating point between the Islamic and Western perspectives is that, in Islam, the revealed scientific knowledge does not need to be empirically proven to be accepted by Muslims as they take the revealed knowledge to be divine and unchallenged. Conversely, contradictions to the revealed knowledge are to be rejected entirely (Sayyid Qutb, 2000a on *surah* Al-Baqarah-2:189).

The *tawhidic* emphasis in *Qur'ân*ic verses is usually combined with highlighting Allah's attributes. For example, Allah is strong and almighty (e.g. *surah* Al-Hadid-57:25). This indicates that acknowledging the qualities of Allah as an act of knowing Him. The more a Muslim becomes aware of Allah, the more one believes in His oneness, which increases and strengthens one's faith (*iman*) in Him (See Muhammad Naim, 2001). *Tawhid* is followed by actions, which are considered religious duties or *ibadah*. According to a *Hadith* reported in Ibn Maajah, Ali (r.a.) narrated that Prophet Muhammad (p.b.u.h.) said:

> "Iman is conviction in the heart, testifying by the tongue and acting upon the pillars of the actions" (*Hadith*, in Luton Muslims, 2010).

In short, conducting research, which is a precondition to technological innovation, is commanded in Islam. It is a vital process to enable man to exploit the resources that Allah has created for them (Al-Hadid-57:25). Moreover, Islam emphasizes the importance of *tawhid* in the process of research and innovation. In this respect, the purpose of a research is not an end in itself. Being innovative does not concern with developing innovations for the sake of innovating, but

rather for a super-ordinate purpose, in which a scientist or an innovator's actions fulfil the *shariah* and Islamic ethical requirements and are aligned with achieving the pleasure of Allah (See Danial, 2010).

Next, we discuss the methodologies for the creative process of innovating from Islamic perspective.

## 6.2 ISLAMIC METHODOLOGIES FOR THE CREATIVE PROCESS

Based on their analysis of the *Qur'ân*, Al-karasneh and Saleh (2010) suggest four methodologies for generating creativity, namely by travelling, seeing, listening and deliberation. In this study, we propose two additional methodologies for the creative process:

### (a) Studying Scientific Knowledge as Revealed in the *Qur'ân*

In Islam, *Qur'ân* is the source of scientific knowledge and innovation. Examples of scientific knowledge revealed in the holy book include knowledge regarding astronomy (*falak*) in *surah* Yunus-10:5 and Yaseen-36:38-40; knowledge regarding zoology in verses of An-Nahl-16:66; knowledge regarding botany in Ar-Ra'd-13:4; knowledge regarding geo-science in verses of Qaf-50:7-8; and knowledge regarding creationism in Al-Mukminun-23:13-14, which explains how humans are created and emphasises Allah as the greatest Creator (see *Al-Qur'ân dan Terjemahnya*, 1991, 93-101).

### (b) Understanding/Learning from Historical Narration/Accounts

Past information can be a source of new ideas when creating new products for the benefit of all, supporting the product's manufacturing process, launching it, and transacting with the customers. The *Qur'ân* narrates many important past events and instructs man to learn from them. For example:

> "There is, in their stories instruction for men endued with understanding. It is not a tale invented, but a confirmation of what went before it a detailed

> exposition of all things, and a Guide and a Mercy to any such as believe"(*Qur'ân,* 12:111)

In *surah* Yusuf-12:111, Allah specifically states that historical events narrated in the *Qur'ân* contain lessons that can be learnt. The knowledge can serve as a guideline and a source for innovation (Sayyid Qutb, 2000f).

(c) Travelling and Observing

There are at least two important verses (Al-karasneh and Saleh, 2010) that indicate the use of this travelling and observing methodology:

> "Say: "Travel through the earth and see how Allah did originate creation: so will Allah produce a later creation: for Allah has power over all things" (*Qur'ân,* 29:20).

> "Many were the Ways of Life that have passed away before you: travel through the earth, and see what was the end of those who rejected Truth" (*Qur'ân,* 3:137).

*Surah* Al-Ankabut-29:20 commands man to *walk the earth* as a way to witness Allah's creations; this instruction, with its emphasis on *tawhid*, shows that Allah has the power to create all things (See Quraish Shibab, 2002; *surah* Al-Ankabut-29:20). This verse, together with the preceding verse (Al-Ankabut-29: 19), encourage man to travel to foreign lands with the aim of acquiring knowledge in the field of botany, zoology, humanities, and geology (See Mahmud Yunus, 1973). In *surah* Ali Imran-3:137, the command to travel is accompanied by a reminder of what would happen to those who disobey Allah.

(d) Seeing and Observing

Many verses in the *Qur'ân* emphasize the use of this technique when seeking knowledge (Al-karasneh and Saleh, 2010). For example, Al-Baqarah-2:164 states:

> "Behold! In the creation of the heavens and the earth; in the alternation of the Night and the Day; in the sailing of the ships through the Ocean for the profit of mankind; in the rain which Allah sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they trail like their slaves between the sky and the earth;¯ (here) indeed are signs for a people that are wise" (*Qur'ân*, 2:164).

The above verse calls on man to *view* the universe as if he was viewing it for the first time, so that admiration and piousness come to his heart and he is reminded of Allah's greatness. This *observation* leads him to acknowledge Allah as the only God served by man (Sayyid Qutb, 2000a on Surah Al-Baqarah-2:164). Moreover, in Al-Baqarah-2:259 the *Qur'ân* also reminds man to *look* at the signs of Allah's ability to give life to humans and animals, and also His ability to take away their lives (See Mahmud Yunus, 1973).

In an additional emphasis in the methodology of seeing, the *Qur'ân* also gives instructions to *see* Allah's creation of the universe and the heavens as a way of strengthening one's faith in Allah (See Mahmud Yunus, 1973, in his discussion on *surah* Al-A'Raf-7:185). The verse ofAz-Zumar-39:21 orders man to *see* Allah's creations and provides *tawhidic* reminders. This verse relates *seeing* with thinking, and in turn relates thinking to those who are wise (See Mahmud Yunus, 1973). Al-Ghashiya-88:17-20 also instructs man to *observe* how Allah created camels, heavens, mountains as well as the earth and to seek knowledge about animals, astronomy, and geography (See Mahmud Yunus, 1973). These instructions are combined with *tawhidic* reminders (Al-Ghashiya-88:21-26); they also emphasizes that humans will return to Allah (Al-Ghashiya 88:25). According to Sayyid Qutb (2000k), *surah* Al-Ghashiya-88:17commands man's attention to Allah's creation because such a deep observation and contemplation of Allah's creation would inspire man's hearts. Such inspirations might lead to the births of more creative ideas for innovation. Verses of Qaf-50:6-8 ask mankind to *observe* Allah's creations, and the verse Qaf-50:8 gives *tawhid* reminders (See

Mahmud Yunus, 1973). The verse An-Nur-24:44 explains Allah's creation of day and night, "which gives instructive example to those who have vision" (See Yusuf Ali, 1934, p. 350).

(e) Listening

There are also several verses in the *Qur'ân* that highlight listening as a method for creative process. This verse instructs man to listen when the *Qur'ân* is recited,

> "When the Qur'an is read, listen to it with attention, and hold your peace: that you may receive Mercy" (*Qur'ân*, 7:204).

Muslims are encouraged to listen to the recitation of the *Qur'ân* because proper listening allows a Muslim to remember and appreciate *Qur'ân*ic verses, and receive blessings in this world and the hereafter. According to Sayyid Qutb (2000d, p. 460) on *surah* Al-A'raf-7:204: "Careful listening to the verses of the *Qur'ân* can produce an amazing variety of effects to one's heart. It stimulates feelings of piousness, influences the listener to correct oneself and provides feelings of calmness". This highlights the importance of listening to stimulate thinking and provide understanding, which would lead to having positive attitudes and enhanced creativity. The following verse also emphasizes the importance of *listening* and choosing the best of advice:

> "Those who eschew Evil –and fall not into its worship and turn to Allah (in repentance) – for them is Good News: so announce the Good News to My Servants. Those who listen to the Word, and follow the best (meaning) in it: those are the ones whom Allah has guided, and those are the ones endued with understanding" (*Qur'ân*, 39:17-18).

According to Sayyid Qutb (2000g) on *surah* Al-Zumar-39:17-19:

> "By listening and accepting the best from what is being told, a person can get guidance from Allah. With this

> guidance, Allah will direct him toward listening and accepting the best, and this makes him receive even more guidance" (Sayyid Qutb, 2000g, p. 586).

Innovation or creativity is the greatest guidance from Allah, in which to listen and accept the best is one source of guidance, as illustrated in the following verse of *surah* Al-Baqarah:

> "The Messenger believeth in what hath been revealed to him from his Lord, as do the men of faith. Each one (of them) believeth in Allah, His angels, His books, and His Messengers, "We make no distinction (they say) between one and another of His Messengers. And they say: "We hear and we obey; (We seek) Thy forgiveness, Our Lord, and to Thee is the end of all journeys" (*Qur'ân*, 2:285).

The above verse emphasizes that listening is the ultimate manifestation of one's *tawhid*, as listening is followed by obedience and the seeking of repentance. Muslims who listen to the call and rules of Allah will follow His commandments and shun the forbidden, thus, demonstrating *tawhid* in their behaviours (Sayyid Qutb, 2000b).

(f) Deliberation

Al-karasneh and Saleh (2010) discuss a number of *Qur'ânic* verses that command man to contemplate (such as *surah* An-Nahl-16:10-11, 13, 68-69, Ali Imran-3:191; Al-Baqarah-2:164). It is concluded that the advice to contemplate is to enable man to find the ultimate truth about himself (his function in this world and his relationship with Allah), and this truth would then serve as a foundation to better understand Allah. This *tawhidic* aspect plays a major role in innovating as innovators who embrace *tawhid* are more motivated to develop innovations for the good of mankind as they believe in the reward in the Hereafter (Al-karasneh and Saleh, 2010).

The concept of *tawhidic* science, as discussed here, indicates the need for *tawhidic* methodologies in research and innovation process. Our analysis shows that the Islamic methodologies for innovativeness

have been prescribed in the *Qur'ân* and are *tawhidic* in nature. 'Creating' (innovativeness) could be achieved through the six methodologies, all of which are basically a form of deliberation technique and have *tawhidic* emphasis in their process. This means that the concept of innovation in Islam brings Muslims closer to understanding their reason for existence in this world and their relationships with Allah. Additionally, the concept of seeing and travelling are closely related to deliberation. In fact, listening is a prerequisite for deliberation (see *surah* Al-A'Raf-7:204). This makes thinking and reflecting as the most important methodology in inventing and innovating. As deliberation is aimed at understanding the truth, the methodologies in thinking and being creative further strengthen the *iman* of Muslims. While these methodologies are most prevalent at the idea conception stage, they can be utilized when making creative decisions in all phases of the innovation process. For example, deliberation could be utilized when deciding on the best of course of action for launching a product.

The methodologies commanded by Allah extend the Western perspective of creativity and innovation. The Western perspective relies solely on scientifically proven knowledge and ignores divine revelation as a source. It also focuses mainly on entrepreneurs' contexts (or environment) in combination with their cognitive reasoning, and their prior experience as a source of creativity and knowledge for innovation. In addition to these Western dimensions, Islam recognizes that creativity and innovation are a continuous process and its methodologies are prescribed in the *Qur'ân*.

## 6.3 ISLAMIC ASPECTS OF RESOURCE PROVISION TO HUMAN BEINGS, INSTRUCTIONS TO DELIBERATE, AND RESOURCE UTILIZATION

In the Islamic teachings, Allah provides worldly materials to man to enable him to perform his religious (*ibadah*) and leadership-vicegerence duties on earth. However, these resources are not 'gifts' per se, but an *amanah* (trust) from Allah to man (See Mohamed Aslam, 1997). As man must perform the duties of a vicegerent, he is literally expected to be entrepreneurial.

> "He it is Who created for you all that is in the earth…" (*Qur'ân,* 2:29).

The *Qur'ân* mentions various provisions of resources for mankind (e.g. Al-Baqarah-2:164; Al-Baqarah-2:29; Al-Hijr-15:20-25). For instance, the following verses explain Allah's provisions of necessities:

> "And We have provided therein means of subsistence for you and for those for whose sustenance ye are not responsible. And there is not a thing but its (sources and) treasures (inexhaustible) are with Us; but We only send down thereof in due and ascertainable measures. And We send the fecundating winds, then cause the rain to descend from the sky, therewith providing you with water (in abundance), though ye are not the guardians of its stores. And verily, it is We Who give life, and who give death: it is We Who remain Inheritors (after all else passes away). To Us are known those of you who hasten forward, and those who lag behind. Assuredly it is thy Lord who will gather them together: for He is Perfect in Wisdom and Knowledge" (*Qur'ân,* 15: 20-25).

Some *Qur'ânic* verses (e.g. An-Nahl-16:11,12,15,16,17) point out the provision of resources in combination with the guidance to deliberation. Deliberation is considered important in allowing exploitation of resources (Al-Hadid-57:25). In another verse, the explanation of resource provision is combined with the instructions to its usage (e.g. An-Nahl-16:14), that supports economic activities (See Mahmud Yunus, 1973).

Another example concerning the provision of resources to mankind can be found in the following verse:

> "It is He Who has made the sea subject, that ye may eat thereof flesh that is fresh and tender, and that ye may extract there from ornaments to wear; and thou seest the ships therein that plough the waves, that ye may seek (thus) of the bounty of Allah and that ye may be grateful" (*Qur'ân,* 16:14).

The Islamic concept of entrepreneurship subscribes to *tawhidic* structurating and cognition. In *tawhidic* structurating, an entrepreneur is expected to direct his efforts in developing business opportunity with his goal toward *tawhid*, in which he responds in a *tawhidic* manner toward his environment; while ensuring the opportunity being pursued conforms to the *shariah* and Islamic ethical dimensions and linking his entrepreneurial act to *tawhid*. Islam emphasizing on the importance of proper deliberation suggests the importance of cognition in entrepreneuring. However, this reasoning goes beyond conventional thinking regarding the opportunity to be pursued and the appropriate resources to be exploited. Rather, this reasoning emphasizes linking entrepreneurial and innovative actions to *tawhid*.

Next, we discuss how exploitation of resources relates to the concept of innovation and *muamalah*.

## 6.4 ENTREPRENEURSHIP, INNOVATION AND MUAMALAH

The concept of entrepreneurship generally concerns with individual acts that help to transform scientific knowledge and discoveries into innovation. The concept of entrepreneurship in Islam is discussed within the domain of resources provision and exploitation as well as *muamalah*, which generally refers to the *shariah*-based economic transactions.

Parallel to the Western view of entrepreneurship, which focuses on achieving premium profitability (Shane and Venkataraman, 2000) amongst the inventor-entrepreneurs, Islam also considers profitability as vital in business. In the verse of Al-Jumuah-62:10, one is instructed to seek material gain once the prayer is done (See Sadeq, 1987). Therefore, Islam considers any economic activity that is not against its teachings as a part and parcel of one's *ibadah*. Entrepreneurship is considered as the search for *halal* living, as Prophet Muhammad (p.b.u.h.) has said: "Searching for a halal livelihood is duty after the duty" (*Hadith*, narrated by Tabrani, in Baig, 2010).This suggests that earning a *halal* living –working and earning through permissible means, as defined by the *shariah*, is the secondary religious obligation after the primary religious duties of praying, fasting, and giving *zakat*.

Therefore, entrepreneurship that seeks profitability is commanded in Islam (See Sayyid Sabiq, 2008). The *hadith* also brings mutuality to the material and spiritual world, thus, considers working for worldly wealth as a spiritual and religious duty (Baig, 2010). Another verse that supports the seeking of profitability is *surah* An-Nahl-16:14, "… ye (mankind) may seek of His bounty", which means man is granted with resources so that he could seek profit from them (See Sadeq, 1987). Other verses that relate the provision of resources to seeking profit include Al-Israa-17:66, Ar-Rum-30:46 and Al-Faathir-35:12. These three verses are combined with *tawhidic* emphases, and demonstrate that seeking profitability could strengthen one's faith in Allah**.** In this regard, resource exploitation and entrepreneurship, and *tawhid* are interconnected.

Moreover, in Islam, the accumulation of wealth not only benefits individuals, but also society (Sadeq, 1990). However, while the entrepreneurial efforts in Western perspective are sanctioned only by ethical codes, in *muamalah*, the *shariah* specifically prescribes certain rules of exchange, which could be applied to the concept of innovating and entrepreneuring. The rules as compiled by Al-Qardhawi (1995) and Sayyid Sabiq (2008) are as among others:

(a) The transaction/dealing between a buyer and a seller should be voluntary (An-Nisa-4:29), and thus innovation should not be forced on the customers;

(b) No useless items should be sold to customers, which means that the innovations offered to customers must be beneficial;

(c) All the three dimensions of *muamalah* –the product, the process of producing it, as well as the process of selling it–should be free from any form of fraud, while any product defects must be disclosed to the customers (As-Syuara-26:183). In addition, overpromising, which includes misleading promotion, packaging and labelling of products are not allowed;

(d) The product, its production and marketing processes must be free from all forms of *riba'* (interest or the price of capital), which

Islam prohibits (Sadeq, 1990) in all its forms, including the penalty imposed on the buyer for late payment (Al-Baqarah-2: 275-278 and Al-E-Imran-3:130); and

(e) The end product should not be *najs* (filth), or contain things that are classified as *najs*, or use *najs* during and in its processing. In Islam, *najs* includes refuse, feaces, alcoholic beverages, pork, carrion, and meat from improperly slaughtered animals (Al-Baqarah-2:173, Al-Anam-6:145 and Al-Maidah-5:3). It is important to note though that there are specific interpretations of these *Qur'ân*ic verses by the different Islamic schools of thoughts (See Deuraseh, 2009).

(f) In producing and selling a product, anything that is *haram* (prohibited) must be avoided, including cheating the customers (Ar-Rahman-55:8-9; Ash-Syuara-26:181-182) and taking advantage of orphans (Al-An'am-6:152);

(g) Practicing business monopoly, hoarding of supplies, and pursuit of predatory business practices are forbidden.

These *shariah* rules must be obeyed by Muslims involved in *muamalah* – either as sellers or as buyers (Sayyid Sabiq, 2008). The *muamalah* has three important dimensions: the product, the innovation process, and the exchange process between a seller and a buyer. Thus, *mualamah* begins the moment the product is conceived and created, up to the point when the product is delivered to and received by the customers. In this regard, *muamalah* is embedded within the product innovation and its processes. For each of the innovation phases, and as the process of product development moves from one phase to the next, *shariah* compliance of the process and the product must be ensured (Al-Maidah-5:1-5; 88). In this regard, the science, methodologies and resource exploitation based on *tawhid* serve as the guiding principle. In short, prescriptions of innovations are set in within *muamalah* and vice-versa, which indicates a close relationship between the two concepts in Islamic teachings.

## 6.5 THE CONCEPT OF TECHNOLOGY DEPLOYMENT AND PRODUCTION IN ISLAM

In discussing technological innovation, particularly technology deployment, Islam has prescribed the concept of *maqasid of shariah* (objectives of *shariah*) and *maslahah* (utility). Al-Ghazali defines *maqasid as-shariah* as the preservation of the religion, life, mind, offspring and wealth (Abdullaah Jalil, 2006). *Maslahah*, on the other hand, refers to any means or things that protect the *maqasid as-shariah* and its implementation must be in accordance with the following priorities (Abdullaah Jalil, 2006; Yasmin Hanani, 2005):

(a) *Darruriyyah* (necessities): activities/things required for preserving the five elements of religion, life, mind, offspring and wealth;

(b) *Hajiyyah* (conveniences): activities/things needed to make life easier for man;

(c) *Tahsiniyyah* (refinements): activities/things that are desirable, and beyond those that are convenient.

Therefore, in addition to the conventional considerations of technology deployment discussed earlier, Islamic teachings emphasise the need to address the objectives of *shariah* and the concept of utility. In an Islamic society, it is important that innovations meet the *shariah* objectives of protecting the five basic human elements, while those that are in conflict with such protection are discredited and disapproved. Thus, the entire process of innovation, including scientific research and R&D, must ensure that the concept of *maslahah* is understood and the objectives of *shariah* are fulfilled. Additionally, production priorities must be established within the context of social and economic developments. It is important that they fulfil the basic needs of people (*darruriyyah* and *hajiyyah*) (See Sadeq, 1990). Anything beyond *tahsiniyyah*, especially innovation in inappropriate and harmful products, and those that promote self-indulgence are disapproved in Islam (See Abdullaah Jalil, 2006 and Sadeq, 1990).

In addition to the need for reciprocal communications between technology deployers and the targeted users, Islam also stipulates the

requirement for integrating customer communication with elements of *tawhid* to fulfil the vicegerency responsibility of the firms' entrepreneurs and managers. This means that a product innovation and its corresponding promotion and packaging are aimed at increasing customers' understanding of *tawhid*, which could, later on, shape their behaviours and actions.

In considering innovating and entrepreneuring as *ibadah*, the inventors, entrepreneurs and managers must aim at "doing good deeds" and achieving perfection (*ihsan*), as mentioned in *surah* Al-Mulk:

> "Blessed is He in Whose hand is the Sovereignty, and, He is Able to do all things. Who hath created life and death that He may try you which of you is best in conduct; and He is the Mighty, the Forgiving" (*Qur'ân*, 67:1-2).

In discussing the above verse, Sayyid Qutb (2000j) states that a Muslim must constantly monitor his intentions and actions so that he reaches the level of 'best of conduct' (*ihsan*) in the eyes of Allah. The command for *ihsan* is also given in the *Hadith* of Prophet Muhammad (p.b.u.h.). The first command is given in the second *Hadith* of *Hadith Arba'ain*, in which Prophet Muhammad (p.b.u.h.) answered Jibril's question regarding the meaning of *ihsan*. Prophet Muhammad (p.b.u.h.) said: "It is to worship Allah as if you see Him, for though you do not see Him, surely He sees you". In this *hadith*, Allah commands that *ibadah* has to be done with *ihsan*. *Ibadah* with *ihsan* will generate *tawhidic* values in Muslims, as stated by Imam Ahmad ibn Hanbal: "It (*ihsan*) also generates sincerity (*ikhlas*) in *ibadah* and determination to perfect one's *ibadah*" (Al-Hanbali, 2007a, p. 132).

In this sense, *ihsan* means striving toward perfection in carrying out innovation and entrepreneuring. While the concept of continuous improvement is also discussed within the conventional literature, the concept is defined as an end to itself; instead the concept of *ihsan* relates directly to *tawhid*, as it is commanded by Allah. In the seventeenth *Hadith* of *Hadith Arba'ain*, Abu Yaala Shaddad bin Aws states that Prophet Muhammad (p.b.u.h.) said: "Verily Allah has prescribed *ihsan* in all things" (related by al-lmam Muslim). Al-Hanbali

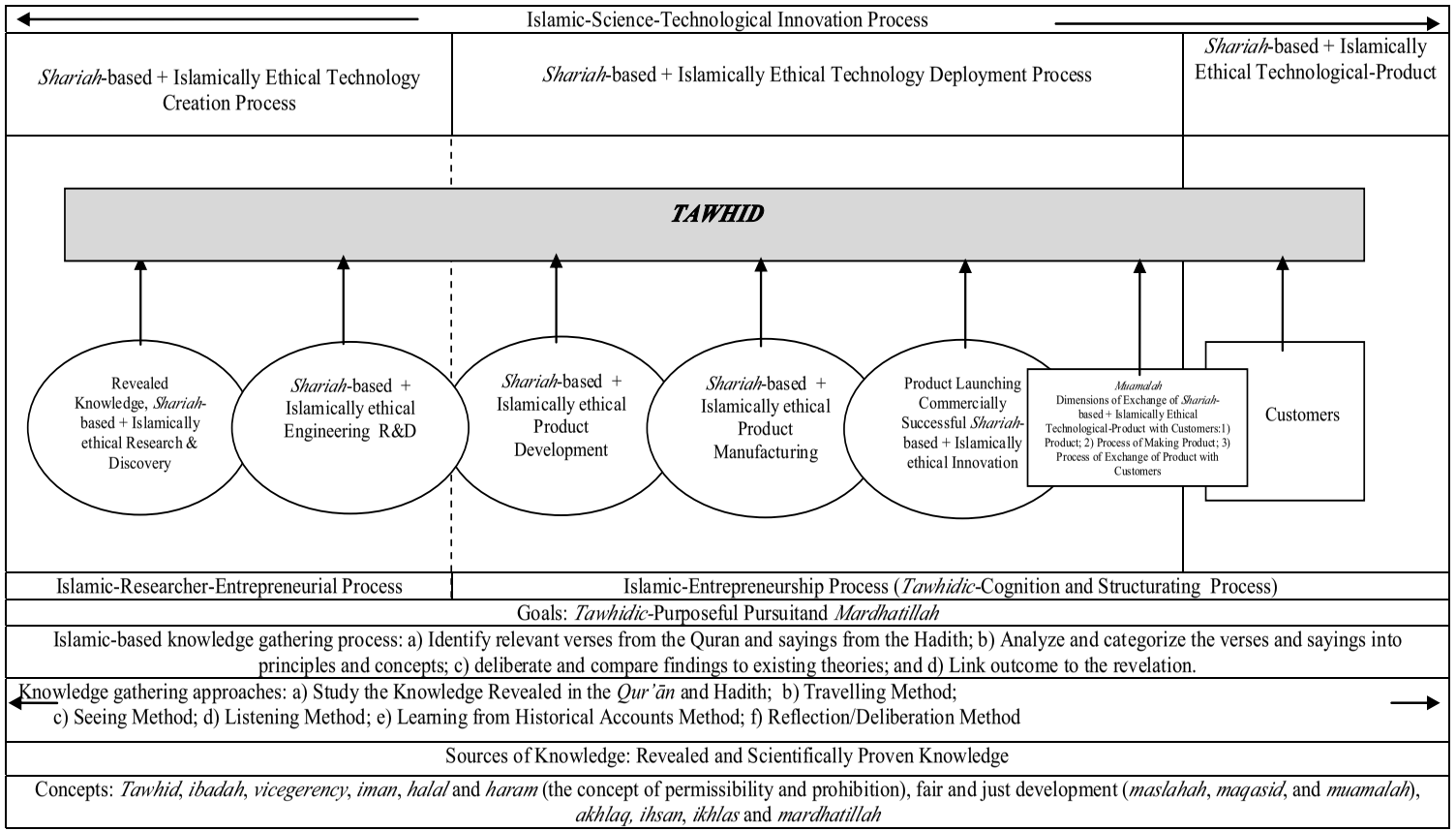
(2007b) interprets *ihsan* as "the act of doing well". In this context, innovation must involve commended deeds and the acts of perfecting them.

## 7. THE ISLAMIC PERSPECTIVE OF INNOVATION, ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT

While the conventional perspective emphasizes entrepreneurship and technological change in achieving economic development, discourses on economic development in Islam centres within the context of the basic objective of *shariah*, which is the "welfare to the people and relief from hardships" (Sadeq, 1987, p. 35). Therefore, the concept of economic development in Islam refers to a balanced and sustained improvement of man's well-being in both the worldly life and the life in the hereafter. It includes three dimensions: (a) economic growth, (b) equitable distribution of income and wealth, and (c) Islamic social environment (Sadeq, 1987).

Entrepreneurship and innovation within an industry is a prerequisite to achieving economic growth. Moreover, appropriate utilization and exploitation of resources, proper management of assets, as well as priorities setting within production are needed. Equitable distribution of wealth is a fundamental Islamic concept, as mentioned in *surah* Al-Hashr-59:7: "...so that wealth and income are not circulated among a few rich of you." (*Qur'ân*, 59:7). This equitable in wealth distribution concerns, first, with the efficient and effective sharing amongst those contributing to the production function in the economy, and second, with the direct transfer of wealth from the rich to the poor within the population. This second category includes the compulsory (*zakat*) as well as optional (*sadaqah*) payments. The first two dimensions of economic development (economic growth and equitable distribution of wealth) must exist in a society with well-established Islamic values (Sadeq, 1987). A just and fair development (*'adalah*) can thus be achieved, which in turn contributes toward economic development in the world as well as prosperity in the hereafter (Chapra, 2008; Sadeq, 1987; 1990).

FIGURE 2
Technological Innovation and Entrepreneurship Process from the Islamic Perspective




Note: The dashed line divides the activities of technology creation and technology deployment in the process of innovation.

## 8. CONCLUSIONS

Innovation and entrepreneurship are commanded in Islam, and thus its conducts form one's *ibadah* and fulfils his duties of vicegerency. Figure 2 shows the Islamic concept of technological innovation and entrepreneurship. While Islam recognizes important elements of Western conventional wisdom concerning the creation and commercialization of innovation, the Islamic perspective is value laden, and thus overcomes the issues brought about by values-less or values-free technological innovation and entrepreneurship. Foremost is Islam's emphasis on super-ordinate goals, which suggests innovation as a purposeful pursuit. Achieving commercialization is not the only outcome sought from the pursuits of innovation and entrepreneurial process; but rather, and most importantly, is to seek the pleasure and blessings of Allah (*mardhatillah*).

In addition, Islam stresses linking the acts of innovation and entrepreneurship to the super-ordinate, *tawhidic* goals within each phase of the innovation process, from idea generation to the point of technology consumption by customers. As the entire process is linked to *tawhid*, the economic and social development that is hoped to be achieved by the innovation outcomes are ensured. Figure 2 shows that the entire phases of the innovation process are on a continuous course of actions that acknowledge the oneness of Allah and strengthen one's belief in Him. At the foundation of this process is *iman*, which is strengthened and manifested into good deeds as the Islamic dimensions are fulfilled.

Moreover, the Islamic perspective also sets guidelines (*shariah* aspects) in regard to acts of innovation and entrepreneurship. While the super-ordinate goals direct man's conception of good deeds and reward, the concept of *shariah* provides the sets of guidelines for his corresponding actions. Important elements of these guidelines include the concept of *halal* and *haram*, and the concept of just economic development (*'adalah*), which integrates the concepts of *maslahah*, *maqasid*,and *muamalah*. In this way, the Islamic innovation and entrepreneurship process supports the achievement of economic gain for inventors, entrepreneurs and managers, as well as for the society at large. Moreover, being an *ibadah*, when done with *ihsan* and *ikhlas*, it

directly supports their efforts toward ultimately achieving *mardhatillah* (Al-Baqarah-2:265).

In conclusion, the Islamic perspective is a values-laden view. It builds upon religious values, which address the issues of super-ordinate intentions and rightfully guided corresponding actions, thus enabling the conduct of values-based innovation and entrepreneurship that achieve a balanced economic, social, and moral development in this world and reward in the hereafter. Innovation and entrepreneurship based on Islamic worldview and principles, which is commanded by Allah, indeed fulfil the needs of human beings—individuals and societies. In explaining verse Ar-Rum-30:30, Sayyid Qutb (2000h) states that these Islamic rulings are in accordance with man and nature. Everything that is commanded and prohibited by Allah is in the best interest of man, for He is the Creator of man (Sayyid Qutb, 2000e, when explaining *surah* Yunus-10:101).

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