TECHNOLOGY AND MUSLIMS: A FIELD STUDY OF IRANIAN SCHOLARS

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Abstract.   Muslim scholars have had different approaches toward modern technologies. Defining the situation in various Islamic countries is dependent on knowing the approaches adopted by their scholars. These approaches create norms which can shed light on the reasons for the success and failure of access to technology and its transference. The present article sets out to analyze the views of the Qom seminary scholars in Iran about the development of modern technologies within the framework of the development sociology using the qualitative methodology of grounded theory. To this end, such techniques as conducting interviews and investigating documents have been used to gather the data. The authors find four paradigm models regarding modern technologies among the Qom seminary scholars. These models are classified into two general categories: optimistic and pessimistic. In the end, an "appropriate technology" approach is introduced as an approach singled out by the researchers.

Keywords: Grounded theory; Iran; Muslim scholars; Qom; sociology of development; technology

STATEMENT OF THE PROBLEM

The development of technology has given rise to deep transformations within societies, so that lifestyles have changed in many countries; the structure of relations among people, groups, organizations, and communities has become different than in the past; social stratification has intensified; the level of production has grown; a variety of jobs have been created; big factories and production centers have been established; and many scientific research organizations have emerged. However, the development of

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technology has not been the same in all countries of the world and in all spatial-temporal circumstances.

Arguably, the reactions of scholars and theorists play a determining role in the development of technology in any society. In Muslim countries, various approaches toward the progress and development of technology have been taken. Identifying these approaches is important for studying the sociology of science and technology. Based on this premise, in the present article the views of scholars in the Qom seminary in Iran on the problem in question are discussed. The article's research question is: What are the views of the scholars and grand Ayatollahs in the Qom seminary about modern technologies?

Considering the above-mentioned propositions, this article is aimed at investigating the viewpoints and approaches adopted by the Qom seminary scholars regarding the development of technology. What necessitates this discussion is the dependence of the fate of Muslim countries on the development of technology. The teachings and evaluations of Muslim scholars and thinkers about social problems have an effect on the common fate of the community, and their views are influential and indeed determinant in decision making. For this reason, hope for a change and development in the Iranian community depends on the views of Muslim religious scholars.

A literature review demonstrates that a number of books have been published on this subject including *Islam's Quantum Question: Reconciling Muslim Tradition and Modern Science* by Nidhal Guessoum. This book presents a coherent, viable, and very modern synthesis of the main and valid principles of science with the core principles of Islam. In this book, the views of some Muslim thinkers including Seyyed Hossein Nasr, Ibn Rushd, and others are discussed (Guessoum 2011). Other works by this author include "Religious Literalism and Science-related Issues in Contemporary Islam" (2010), "The Qur'an, Science, and the (Related) Contemporary Muslim Discourse" (2008), "Issues and Agendas of Islam and Science" (2012), and "Review on Religion and Science around the World, Islam and Science: The Next Phase of the Debates" (2015). The last work reviews developments that have taken place in the past ten to fifteen years in the field of Islam and science including the emergence of a "new generation" of thinkers, Muslim scientists who accept modern science's fundamental methodology and theories and the exponential increase in the popularity of the "I'jaz 'Ilmy" theory, that is, the miraculous scientific content of the Qur'an and Hadith. Of other works in this regard, mention can be made of *Religion and Technology in the 21st Century: Faith in the E-World* by Susan George (2006).

In the area of recent technology development, Mark Webster has published a paper entitled "Examining the Philosophy of Technology Using Grounded Theory Methods" (2016). Another work in this area is *Science, Technology and Society* by Robert McGinn (1991). This book is an

introductory study of science and technology with a particular focus on the contemporary era in the West. *Management of Technology Transfer and Development* by Nawaz Sharif (1983), *Science and Technology in Society: From Biotechnology to the Internet* by Daniel Kleinman (2005), *Science and Religion* by Thomas Dixon (2008), *Religion and Science: Historical and Contemporary Issues* by Ian Barbour (1997), and *From Secular Science to Religious Science* by Mehdi Golshani (1998) are other notable recent works on this subject. In his influential work, Golshani is of the belief that natural sciences were originally shaped by a religious view, but during the past two centuries have been secularized. He holds that science should once again take a religious orientation so that other aspects of human existence may flourish (Golshani 1998).

What differentiates the present article from the above works is that the statistical population (participants) of the present research is restricted to the Qom religious scholars and grand Ayatollahs in Iran who have been interviewed. In Iran, Qom is a significant city because it has many religious schools and many Shiite clerics and religious scholars live there. Within the framework of sociology of technology, this study attempts to introduce approaches adopted by the Qom seminary scholars. This kind of study in the humanities is novel and under researched, and further studies need to be done on this subject.

METHODOLOGY

The present research is based on grounded theory and has applied such techniques as designing interviews, observations, and participation. In the first step, some data about Iranian society have been collected through snowball sampling (Given 2008). "In this method, the subjects are seen as links of a chain who introduce each other and new data collection units are chosen as supplementary to the previous units. This method is usually used when it is not possible to get a statistical framework and when the members of the sample know each other" (Azkia and Darban Astaneh 2010). In this step, the views of Iranian theorists and thinkers about the development of technology in Iran were elicited through interviews. "Interview with elites" is a specific type of interview which focuses on a specific group of interviewees. It has many advantages, because very valuable information can be obtained from these people. It has its own disadvantages as well, because access to this group of people is not easy. A researcher who seeks to conduct an interview with elites should be of a high proficiency and should have a deep knowledge about the topic of the interview; otherwise the interviewer will raise a question within the framework of a theoretical problem. Since elites possess high intelligence, knowledge, and insight, there is the possibility that they take the interview under their control and give it a new insight and view (Marshall and

Rossman 1998, 115–17). The instruments for data collection in this research are interviewing the Qom seminary clerics and scholars, investigating the treatises of the clerics, and seeking the fatwas issued by the clerics (see the Appendix for the interview questions).

It should be mentioned here that a "fatwa" is an advisory opinion issued by a recognized authority on law and tradition in answer to a specific question. It should also be added that sampling in this research is in relation to a developing qualitative research. As Uwe Flick observes about this methodology, "the next case contributes to the development of a theory and is associated with it" (2009, 185).

Using grounded theory, during sampling the researcher looks for indices representing concepts which are theoretically related. The researcher then compares these approaches and events in terms of their dimensions and characteristics (Corbin and Strauss 1998, 2008; Azkia and Imani Jajarmi 2011). The Qom seminary clerics and thinkers constitute the participants of this study and, according to the research objective, a suitable sampling for this research is snowball sampling (Given 2008). The number of respondents in the sample depended on the theoretical saturation. Because our study was meant to investigate the views of the Qom seminary clerics on the development of technology, we adopted the grounded theory method as most appropriate. The novelty of the sociology of technology development in Iran is another reason for adopting this method. Grounded theory is derived from data, systematically collected and analyzed through a research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another. A researcher does not begin a project with a preconceived theory in mind (unless his or her purpose is to elaborate and extend the existing theory). Rather, the researcher begins with an area of study and allows the theory to emerge from the data. Theory derived from data is more likely to resemble "reality" than one derived by putting together a series of concepts based on experience or solely on speculation (how one thinks things ought to work). In this method, a researcher does not start from a specific point; rather he/she begins from a specific research area and it is given time to show itself (Corbin and Strauss 1998, 9–22). This approach is fit for the purpose of this article because its theorizing is based on regular data collection and systematic analysis of the data, whereas other methods including content analysis do not follow the objective of theorization. A theory, according to Corbin and Strauss (1998, 37) is a set of concepts connected together with sentences that constructs a framework which can be used to explain or predict phenomena.

The data for the present article come from interviews with Qom seminary scholars (Grand Ayatollahs) seeking their fatwas.[1] According to the grounded theory method, the interviews were analyzed line by line and then the sentences and paragraphs were encoded. A total of 1,064 raw data

points were obtained. The raw data were reduced to 840 concepts and these concepts were ultimately reduced to 73 categories.

THE CONCEPT OF TECHNOLOGY

According to the *Oxford Advanced Learners Dictionary*, the term "technology" is derived from the root "techne" which means a technique or a skill. Technology refers to "application of science for practical purposes especially in industry and in computer techniques." Also, it has been defined as "a tool for the development of science" and "a branch of science which is related with engineering or application." The term "technics" means "the science or study of skills, especially, mechanical or industrial science." And the term "technique" is "a method for doing specific tasks, carrying out a technical work or a scientific method, skill or ability in a specific area, a scientific method to do or obtain something" (*Oxford Advanced Learners Dictionary* 2005, 1810–11).

Val Dusek presents three definitions or characteristics for technology—as hardware, as rules, and as a system (2006, 31). Derek Miles defines technology as "a tool we use to solve our practical problems. It is a combination of hardware (including buildings, plants and equipment) and software (including skills, knowledge, and experience) together with an institutional order." According to him, modern science developed in communities that put a great emphasis on technological development in order to penetrate the secrets of the nature" (quoted in Berg Olsen et al. 2009, 19). Accordingly, technology has been defined by two different approaches: software and hardware approaches. Those based on engineering concepts—making artifacts and their application—are hardware definitions of technology, but those based on the impacts of technology on social institutions are the software definitions of technology (Tavakol 2011). This article emphasizes the study of technical instruments, though social aspects also are taken into consideration.

ANALYSIS OF PARADIGM MODELS

Grounded theory requires detailed line-by-line analysis at the beginning of a study to generate initial categories (with their properties and dimensions) and to suggest relationships among categories, a combination of open and axial coding. During open coding, I (first author) used the Corbin and Strauss (1998, 2008) coding paradigm to analyze data for context. The work involved qualifying the conceptual categories by defining properties, which are characteristics that describe the concepts, and identifying dimensions, which are variations within properties that provide specificity (Corbin and Strauss 1998, 2008). I first broke apart the data in open coding to define the concepts, and this was followed by axial coding to put the
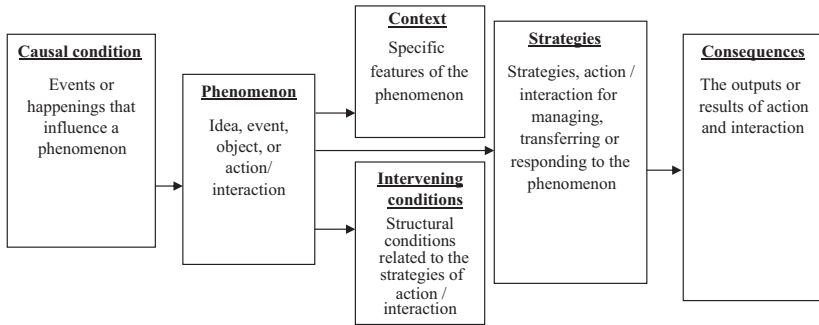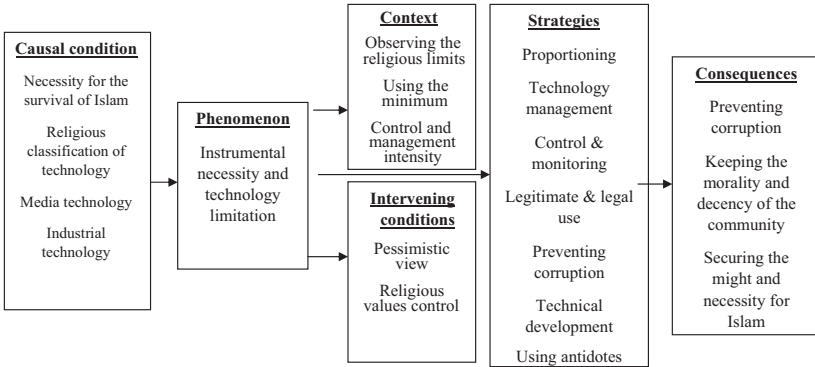
Figure 1. Paradigm model.

data back together by relating concepts to each other. In my research experience, I found that coding was a fluid and evolving process—gradually, certain concepts emerged as primary concepts, were placed at the center of an axis, and then secondary concepts were related to the more primary concepts.

In axial coding, the causal conditions, context, intervening conditions, action/interaction strategies, and consequences of a phenomenon were detected. Then, the process of theory purification and unification known as "selective coding" was carried out. Causal, intervening, and contextual analysis provided ways of trying to sort out some of the complex relationships among conditions and their subsequent relation to actions/ interactions. Causal conditions usually represent sets of events or happenings that influence a phenomenon. "A concept is a labeled phenomenon if it is an abstract representation of an event, object, or action/interaction that a researcher identifies as being significant in the data. The purpose behind naming phenomena is to enable researchers to categorize similar events, happenings, and objects under a common heading or classification" (Corbin and Strauss 1998, 103). "Contextual conditions are the specific sets of conditions (patterns of conditions) that intersect dimensionally at this time and place to create the set of circumstances or problems to which persons respond through actions/interactions" (Corbin and Strauss 1998, 132). "Intervening conditions are those that mitigate or otherwise alter the impact of causal conditions on phenomena" (Corbin and Strauss 1998, 131). This process is shown in Figure 1.

Computers cannot intelligently formulate concepts, but data analysis software can help to remove some of the drudgery from data analysis and can be useful for organizing, managing, searching, and coding data (Corbin and Strauss 1998, 2008; Webster 2016). I used the qualitative data analysis software program MAXQDA 10 (recommended by Corbin and Strauss in their research guide) to import transcripts, write memos, code conceptual

Figure 2. Paradigm model for necessity of limited application of technology.

categories, properties, and dimensions from the data, conduct data analysis, and refine conceptual theory.

In unification, categories are organized around a central concept which has explanatory power. In the process of taking these steps, four general paradigm models were developed: (1) a paradigm model for the necessity of limited application of technology, (2) a paradigm model for the necessity of technology application, with a recommendation that it be used with caution, (3) a paradigm model from a pessimistic outlook that uses a software definition of technology, and (4) a paradigm model of technology as a tool for scientific development, skills, and knowledge. These models are discussed in detail below. These paradigms are based on the authors' analysis of the concepts without any manipulation. The researchers have achieved the following approaches based on research findings and interviews that uncovered relationships among concepts. Quotations are taken from the study's interviews with various clerics (see Nasiri 2015); individual clerics will not be identified by name.

Paradigm model for necessity of limited application of technology. Figure 2 shows that technology is seen as an essential tool for Islam. The hardware definition of technology implies causal conditions for the instrumentality of technology. The instrumental view to technology is like the image of a knife striking to the mind. This knife may have both positive and negative consequences. According to this paradigm, technology is classified into three categories: (1) technologies which have *Halāl* benefits; and (2) technologies which have *Harām* benefits; and (3) technologies which share both *Halāl* and *Harām* benefits and which are multipurpose. *Halāl* refers to any object or an action which is permissible to use or engage in, according to Islamic law (Shariah). The term covers and designates not only food and drink, but also all matters of daily life that are permitted according

to Islamic law. In the same vein, *Harām* is an Arabic term meaning "forbidden." For example, the consumption of pork and alcohol are *harām* in Islamic law.

As for the above three categories, the first category (*Halāl*) is seen necessary in some circumstances. In this category, technology is seen as religiously obligatory, because it is essential for the survival and sustenance of the Islamic system. The criteria of strength, power, prestige, glory and might are of paramount importance in this category of technologies. An example of this category is military technology, which is religiously obligatory for Muslims in order to resist domination by their enemies.

The second category pertains to technologies which have *Harām* effects. These technologies should be prevented. Tools used for gambling and corruption and *Harām* music are examples of this category. Some characteristics of these technologies according to the views of the Qom seminary clerics are as follows. They are harmful and damage public decency and the moral value of society. They endanger humans' spiritual dimension. They are in contrast with the ethical and Islamic values of the society. They tarnish humans' reputation. They are not in parallel with the objectives of the creation; rather they are aimed at humans' decadence. They are signs and symbols of Satanism like atomic bombs. They are costly technologies which waste public treasuries and which have no glory or grandeur for Islam. They result in corruption and nudity. They bother other people. In short, it is religiously prohibited to invent, discover, or apply this category of technologies, and buying or selling such technologies is tantamount to committing sins.

The third category pertains to technologies of which no explicit mention has been made in Shariah about whether they are *Halāl* or *Harām*. They have both negative and positive functions and are versatile. The circumstances under which these technologies can be applied are determined by religious fatwas. If these technologies are used for *Halāl* purposes, they are regarded as *Halāl*; otherwise they will be *Harām*. Application of these technologies for other *Halāl* inventions, discoveries, or transportation is religiously permissible. But if they are applied for *Harām* purposes, they will be religiously problematic and hence prohibited. So the way these types of technologies are applied is a criterion for its being *Halāl* or *Harām*. This category encourages the application of *Halāl* technologies. *Halāl* technologies are allowed to be used, because their permission has been mentioned by the Quran and in Shariah. Also, the Imams and the saints in the early days of Islam did not oppose the application of the technologies of that time; textile, agriculture, architecture, and cartography technologies were not banned by Islam, rather Muslims were encouraged to use them. The more the approach toward technology is not beneficial Lack, the more the inclination toward limitation and prohibition of technology in society will go up. Lack of trust in a technology necessitates the intervention of

a third party in controlling it. The following views on technology underscore the necessity for intervention of the Islamic government in this regard. Media technology (e.g., TV, movies) is in contradiction with moral and Islamic values. Society becomes vulnerable following the transference of technology, especially communication and media technologies. Satellite communication is in contradiction with Islamic values. Media technology is detrimental to humans and society. Technology transfer has no proportionality with the culture of an Islamic society.

These views emphasize concerns for the loss of religious and Islamic values and the necessity for imposition of controls and limitations and intervention by an Islamic government.

Another view that stresses the necessity for imposition of controls and limitations is that technology is a public sphere, rather than a private one. In other words, the claim that technology is part of the public sphere leads the government to intervene. According to this view, the public expediency of the society is prioritized over the desire of individuals to choose technology, and condoling technology does not have any contradiction with human's will and desire. As a consequence, absolute use of technology is not religiously allowed. Because absolute and excessive use results in corruption, people's authority is undermined.

There are two strategies in this paradigm regarding technologies: restrictive strategies and binding strategies. These strategies are based on the classification of technologies into *Halāl, Harām*, and obligatory. For *Harām* technologies, the restrictive strategy is followed, but for obligatory technologies the binding strategy is adopted. For destructive technologies, the restrictive strategy is adopted. In line with this strategy, the importation of destructive technology is banned and if in any case the technology is imported, *antidotes* or restrictive technologies are employed. Under this paradigm model, prohibition and censorship of technology is obligatory and it is necessary to control its importation, distribution, and application. Regarding the importation of technology, the government should pass regulations for choosing the technology and the advantages of the technology should be separated from its disadvantages. Management, control, and legislation are key words in this paradigm model.

The restrictive strategy has some consequences. Control of technologies can prevent corruption and destruction and can preserve the morality and decency of society. Consequences of the binding strategy include keeping supremacy in competition against other countries, the glory and survival of Islam, avoiding backwardness, and technical and technological progress and development. Technology-related issues in this model include technophobia, self-sufficiency, spiritual degradation (where human beings are reduced to machines), and confusion (created by technology for individual identity) (George 2006, 24–25).
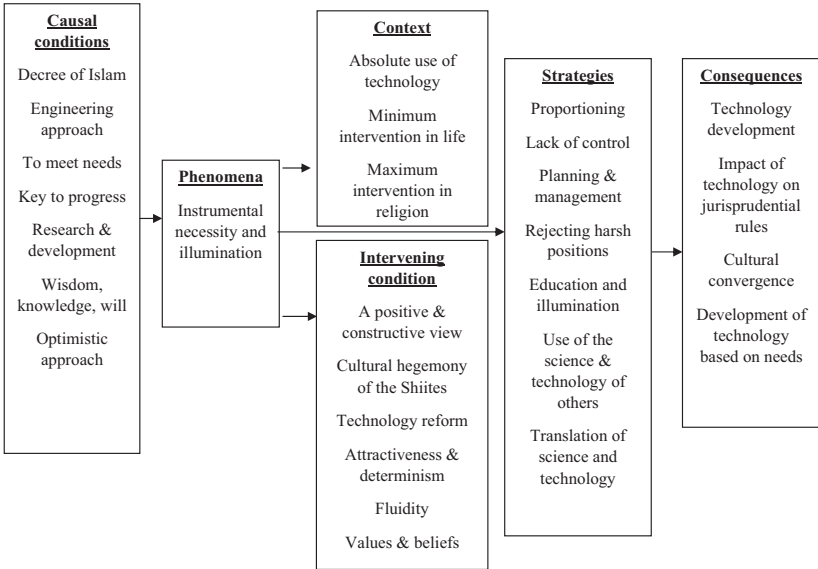
Figure 3. Paradigm model for the necessity of technology application together with aware-ness.

Paradigm model for the necessity of technology application together with awareness.   As Figure 3 shows, this paradigm model has an optimistic approach toward technology because it sees technology as sacred. According to this model, technology can leave a positive impact on the lives of humans. Technology is a key to human development and progress. Religious documents including the Quran and sayings of the prophet and Imams have stressed the development of technology and the absolute use of science. The holy prophet of Islam employed military technology in wars. He once sent some men to Yemen in order to learn military techniques. Intellectual reasons also underscore the use of science and technology. Attempting to use the best and most advanced technology is recommended under this paradigm. Characteristics of this paradigm include the necessity for technology, attractiveness and determinism of technology, the fluidity and universality of science, deterministic development of technology (in the sense that we cannot ban the importation of technology by security measures), the society's need to interact and benefit from the world's progress, non-cessation of technology in the society, and the necessity for aligning technology with Islamic values and culture. Employing an engineering approach and accepting the positive results leads to the application of technology for living a life of peace and without concerns. Technology is a tool for meeting spiritual needs including fun, refreshment, and diversity. Banning the importation of technology is retrogressive and

biased. Like the first model, this paradigm model sees technology as a tool which can be used for both negative and positive purposes and introduces technology as a neutral tool. Accordingly, technology is merely a tool and has nothing to do with the Western world. Technology is not corruptive in itself. Unlike the first approach, however, in this model high importance is attached to science, will, and the system of the human soul." Here, intellect, science, and will are introduced as three basic pillars of a society supporting growth and development. Free will and choice are the highest principles of humanity with reference to technology. Freedom and power to choose are among the highest blessings from God. The importance of intelligent thinking, human free will, and freedom is depicted as though technology is not harmful to Islam whatsoever; rather, Internet technology for example deepens human knowledge. Here, human will and religion are seen as dominant over technology and technology is not seen as something opposed to religion. In fact, religion is superior to technology and any technology should defer to religion.

The approach introduced in this model is that of educating and illuminating the people. Education and culture-building for proper use of technology is based on freedom of choice, such that people do not use technology for negative purposes. The proponents of this model do not agree with passive and directive treatments, arguing that technology deepens people's knowledge and banning it can make Muslims fall behind other nations. In this model, cultural management is emphasized and self-censorship is left to the people themselves and it is the people who should make a choice. Social management of technology also is emphasized in this model. Creating public satisfaction is one of the strategies of this model, because dissatisfaction with media can impel the people to use satellite technology. Hence, improving the management of domestic media is emphasized. Furthermore, translation from already proposed patterns is presented in this paradigm. According to the cultural history of Iran, Iranians have always adopted Western science and industry and have translated them into a native Iranian-Islamic pattern. Planning, knowledge and human will are three key concepts in this paradigm. In order to make a compromise between technology and Islamic values, planning is necessary. Consultation with experts and respect for their theory and knowledge is recommended in this paradigm. In this regard, consultation with jurists is necessary. This view is common among the Shiites.

Paradigm model for software and pessimistic view of technology.   In this paradigm model (Figure 4), technology is divided into three levels. The first level is the machinery. The second level is the software dimension which leads to technology production. In this level, the management and epistemological system give identity to technology. In the third level, technology is seen as a tool for production. In this level, the system of human's desires
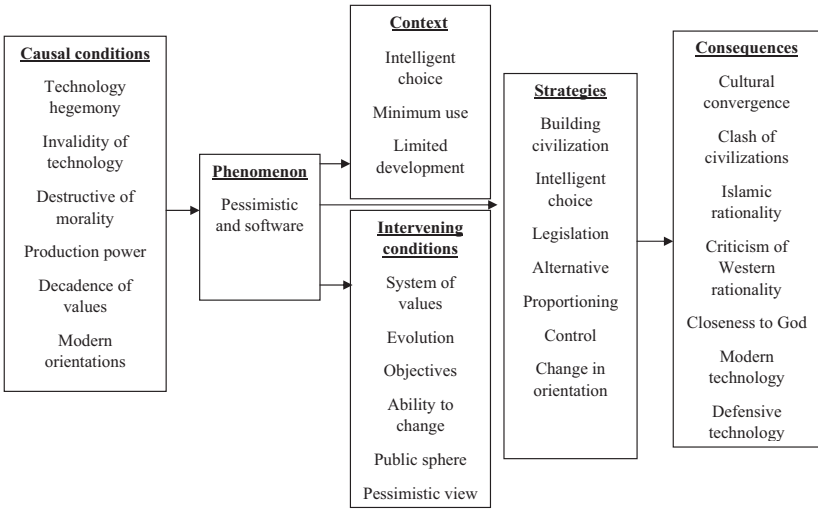
Figure 4. Paradigm model for software and pessimistic view of technology.

and needs which lead to specific sciences and skills (the second sense of technology) are considered in technology analysis. These three levels conceive of technology as a type of software. Here, technology is defined as both software and hardware. In other words, technology refers to a tool for production and for education. Technology is an artificial need constructed by culture. So technology brings about a kind of cultural industry. This approach differentiates it from the other models. In this model, technology is not merely a tool, but science, skills, and management systems also are understood as technology. This paradigm model has a pessimistic view of modern technology, seeing it as an evil phenomenon which is not fit for the Islamic community. In this view, technology causes cultural hegemony and weakens direct communication between people. These new technologies spread Western values and reproduces them in the Islamic community. One of the circumstances which influence the pessimistic view to technology is that modern technologies are essentially different from those available in days of the Prophets and Imams. To use modern technologies, the tradition of the Prophets and Imams cannot be consulted. So modern tools which are based on modern technologies are invalid, because all the sciences are instrumental and have been developed in Western civilization. The Shariah has not confirmed them because they are not related to revelation. Technology is the offspring of desires which are contrary to the values of the Islamic system. Technology is the offspring of excessive demand competition, and creates discontent. Technology is not a construct of the divine culture. Technology impels humans to materialism and leads to loss of spirituality, loss of human dignity, wars, and injustice, and undermines the beliefs of

the people. Therefore, the general view of this model toward technology is negative. Technology in this view is seen as a tool at the service of the West's cultural hegemony. Here no distinction is made between positive and negative technologies and all technology is seen to be a construct of the West with a specific purpose. All these factors lead to a pessimistic view of technology. The pessimistic view encourages imposition of limitations on technology. The use of technology is allowed only when it is essential and vital. This view holds that Western technology should be replaced by technologies which fit Islamic values and culture. According to this view, importing the latest technology is not an intelligent choice. This paradigm model has three criteria and intervening circumstances: values, beliefs, and behaviors. In other words, behavioral, moral, and ideological patterns mean that religion can intervene in the process of technology change. The criteria prepare the ground for changing technology. The ability to change technology is one of the conditions which influences the strategy of management and replacement of technology. According to this approach, science and technology can be managed. "Management" and "intelligent choice" are two key terms in this paradigm.

In reaction to the pessimistic view to technology, some agents have devised other strategies. A limited development of technology is one of these strategies. In this paradigm, the unlimited need for technology is rejected, but a minimum use of technology is sensible. Technology may be direly needed when there is no replacement for it. Cutting ties with technology is not recommended in this approach. This approach holds that in the historical movement toward the end time, conflict with Western civilization is inevitable. In this view, history is a scene of clashes between the civilizations. It should be mentioned that most attention is paid to the "soft war." In this war, Islamic civilization criticizes Western rationality and deepens Islamic rationality at national, regional, and global levels. To this end, media technology is used to spread Islamic rationality and criticize Western rationality. It is obvious that this strategy requires use of various technologies. Accordingly, defensive technology is allowed (Drang 2014). Policy making and legislating are other strategies which are seen as governments' rights. The government has the right to develop policies and regulations as citizenship rights. Technology management is another strategy, in which a gradual change in orientation is stressed. In yet another strategy, technology replacement, new tools are needed to get closer to God. According to this strategy, what has made the existing technology is not monotheism and the spread of divine values. Therefore, we should move in a direction such that this historical deviation may be corrected. According to this approach, in the first step, the application of technology is dominated. In the second step, technology is not imported. In the third step, technologies are replaced. Other strategies include the necessity for censorship and filtering and
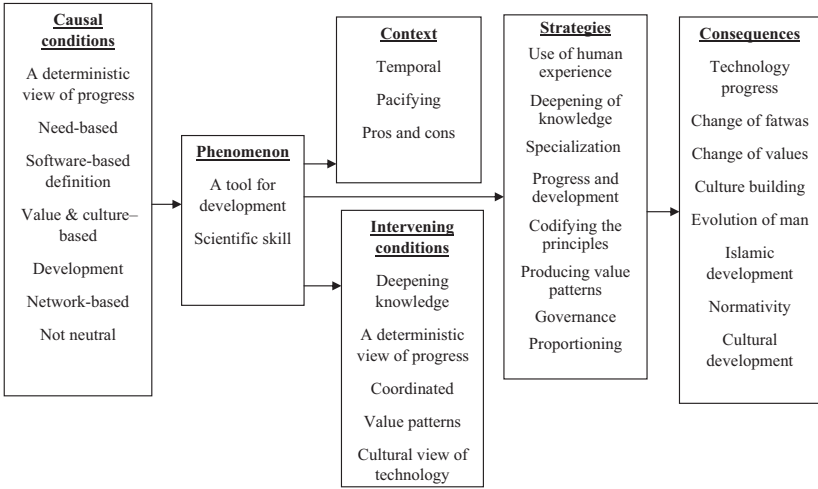
Figure 5. Paradigm model of technology as a tool for development, skill, and scientific epistemology.

proportioning. In using modern technologies, it is emphasized that the current capabilities of technology should be beneficial.

The consequences flowing from this paradigm model include cultural convergence, clash of civilizations, Islamic rationality, criticism of Western rationality, dominance over minds and capture of hearts, closeness to God, modern technology, naturalization, construction of technology, and defensive technology.

Paradigm model of technology as a tool for development, skill and scientific epistemology.   This paradigm model (Figure 5), like the previous model, holds that technology should be defined both in terms of software and hardware, but it does not have a totally pessimistic view of technology. It has a systemic view of technology, seeing it as a "network of factors." Accordingly, technology is divided into various facets including brain-ware, management-ware, software and organization-ware. Brain-ware refers to thought oriented to interpretation of technology. Software refers to the system of planning, applying and managing of software. Management-ware refers to human management of resources. Organization-ware refers to the management structure in which the facets are applied. Hardware refers to the hard events and occurrences belonging to management. Accordingly, classifying technology into good and bad generally makes no sense (Jester 1982; Dusek 2006; Berg Olsen et al. 2009). Neutrality of technology is one of the characteristics of this model. This means that technology progresses in its cultural context. Technology develops with specific attitudes in a particular society. In this view, the Internet is seen as a medium which

is culture-bound and value-laden. Technology is the product of human knowledge and culture. It is ever-growing in its culture-boundness and its hardware dimension is dominated by its software dimension. Technology is knowledge-based and need-based—this is a condition for the development of technology, because society needs information. Technology in this model is introduced as scientific knowledge and skill. In this model technology is seen as value-oriented, biased, and ideological, stressing the fact that it is a form of scientific knowledge. This model sees technology as necessary for society and emphasizes its development. Furthermore, this model has a deterministic view to technological progress. It holds that technology never asks the people to allow it in and that people cannot easily resist it. Because technology is need-based, importation of it is easy and resistance against it is difficult. Technology is oriented to external developments and if it does not come in through the door, it will break in through the window. Regarding the proportionality of technology with the culture of society, the above model holds that modern technology does not fit with the traditional lifestyle of our society. The design of modern buildings does not fit with the collective thinking of the Iranian family. The technology-oriented programs in the seminaries are not proportionate to our cultural coordinates. In this respect, adapting technology to religious values and traditional life in Iranian society is one of the strategies recommended by this view.

From this perspective, technology is culturally effective in society. To use another terminology, technology has both positive and negative effects. Negative consequences include the transformation of lifestyle, generation conflict and a gap between parents and children, a change in values and beliefs, and dependence of the workplace on technology. In fact, technology influences the system of society and changes it. Public culture and the sense of rationality changed concurrently with the development of radio and television. In this view, humanity is seen as a whole which intellectually develops in parallel with the growth of the technological tools. Modern orientations have been influential in seminaries too, such that they have led to changes in fatwas and new readings from the texts by jurists. On this basis, the reaction of the jurists to technological changes is from the perspectives of proscription and admission. This means that after the introduction of a technology, seminary jurists allow some of its consequences and proscribe some others.

Technology management in this paradigm model is a key concept with specific interpretations. In technology management, a merely ideological or security view is not effective. From this perspective, technology management is culture-based. Structural management together with a cultural approach can be useful. Culture is thus the driving force of technology. In technology management, the principles and regulations for the use of technology should be codified.

Management is strengthened in four areas: knowledge system, life role model (culture), management of equations (e.g., politics), and the management of potentialities (economy). Management should not be viewed from the perspectives of security and jurisprudence. This paradigm holds that control over technology should be culture-oriented, rather than security-oriented. Of course, management is at the service of governments, though its expert level is beyond the government level. One of the important strategies in the encounter with technology is control over technology. Technology is of two types: inevitable and avoidable. In inevitable technologies, control and using controlling tools is necessary, but not permanently. Using controlling objects is just a short-term remedy. In this model, a combination of cultural management and control management is recommended as a successful strategy. In fact, preparing the cultural ground and relief of limitations simultaneously is the right strategy for engaging with technology. Censorship in this strategy is introduced as a public right, and the Islamic government has to respect public rights. The censoring tools, the limits and the quality of censorship, are determined by the government. Limitation and censorship should be based on regulations and scrutiny by experts. Presenting solutions to cultural development and creating a cultural ground together with censorship are among the strategies of this model. Censorship cannot ban modern technologies. Also, cultural development and management, in addition to the limiting tools, are among the strategies of engaging with technology.

"Privacy" is a key term in this paradigm model. According to this model, where the privacy of the people damages the public sphere of society, management intervention becomes necessary. In other words, this matter is in parallel with the national interests and belongs to the public sphere. Intervention in this regard is not an intervention in private space. According to the government system, technology is related to national identity. So humans have limited free will to use technology.

One of the strategies for engaging with technology is enhancing knowledge about it. Islamic culture is opposed to harmful satellite programs and websites. Here, human cultural ability is emphasized and the extent of human freedom depends on it. The more humans are culturally and ideologically strong, the more they will be free. In this regard, intellectual maturity is a strategy which can determine the right use of technology. In order to properly use the technology, it is important to enhance the cultural level. A fit cultural ground should be prepared as a strategy.

It is the deterministic development of technology that breaks the limitations and makes temporal the filtering. Governments cannot always resist public demand. In fact, proxies and modern equipment make it difficult to limit technology. The positive impacts of censorship are greater than its negative impacts, because few people are able to lift the limitations imposed on cyberspace. In this view, the machine is seen as a human artifact and

human free will is stronger than technology. Humans are able to dominate technology and change it. In this view, the admission of technology does not mean surrendering to it. Activity and agency of technology are basic concepts in this model, in the sense that technology has swept across our lives.

Table 1 compares the four paradigm models.

CONCLUSION AND RECOMMENDATION

In this article, the various approaches of the Qom seminary clerics toward technology have been investigated using the qualitative method of grounded theory. The study is aimed at shedding light on the approach of the clerics through building a theoretical model. The elements of this model arise from the research data obtained from the interviews and documents. No already defined concept or hypothesis was imposed on the data. An attempt was made to make a theory based on the data. The data were obtained through conducting interviews with the clerics of the Qom seminary.

In summary, it is concluded that there are four general approaches toward technology among the clerics of the Qom seminary. These are (1) paradigm model for instrumental necessity and technological limitation, (2) paradigm model for instrumental necessity and illumination, (3) paradigm model for software-based and pessimistic definition, and (4) paradigm model for development of science and skill. Ultimately, two general models and approaches emerged, optimistic and pessimistic. The two models represent two general orientations in the Qom seminary, though there may be in-between orientations as well.

In the end, an "appropriate technology" approach is recommended based on this research. The industrialized world should continue producing technologies which are appropriate for the needs of developing countries. In this approach, the view that the technologies of the industrialized countries are at present appropriate for developing countries is rejected. The core argument for the appropriate technology is that the technologies of the developed countries are not suitable for countries with religious and traditional cultures. This approach does not have a merely economic view of technology, but is looking for suitable solutions to engage the technology with an emphasis on a socio cultural approach. In this approach, technology development should be aimed at two objectives: maximizing the positive impacts and minimizing the negative impacts. This approach is not totally pessimistic about the results of technology, but neither does it totally yield itself to the achievements of technology and does not totally believe in it. The appropriate technology is based on two approaches: (1) an anthropomorphic approach, which sees technology as a mediator for understanding the humanities or some other sides of life influenced by

Table 1. A comparison of the four paradigm models of the Qom seminary clerics

Paradigm model	Deterministic technology development	The use of human experience	Constructive and positive attitude to technology	Concern about the deterioration of values	Compliance and coordination	Will and human freedom	Technology progress	Control and monitoring
First	−	+/−	+/−	+	+/−	−	+/−	+
Second	+	+	+	−	+	+	+	−
Third	−	−	−	+	−	−	−	+
Fourth	+	+	+	+/−	+	+	+	+/−

Paradigm model	Appropriate technologies	Awareness	Management of technology	Pessimistic attitude	Necessity of technology	Maximum use	Software definition	The difference between the technology and media industries
First	+	−	+	+/−	+	−	−	+
Second	+	+/−	−	−	+	+	−	−
Third	+	+/−	+	+	+	−	+	−
Fourth	+	+	+/−	−	+	+	+	−

technology, and (2) a sociological approach, which seeks to understand how technology settles proportionately in society. Appropriate technology is thus a presentation of a conceptual model of technology which is appropriate for Iran's values of religion and tradition. In this model, technology development is emphasized while religious and cultural sensitivities are taken into consideration.

APPENDIX: QUESTIONNAIRE

Date: _____

Participant name: _____

Job title: _____

Interviewer name: _____

Introductory. This research is based on your opinion about the function of the research, which is made possible by marking your points and recording your sounds. Your responses will help the researcher to consider your point of view and work on all its dimensions. We will ask you to record your interview.

My dissertation research focuses on examining the views of Islamic scholars about the development of modern technologies. Participants in this study include Qom seminary scholars in Iran such as yourself. The interview will include a series of open-ended questions, and is expected to take approximately one hour. Thank you for agreeing to participate in this research study.

To assist with my data collection and interview note taking, I would like to video or audio record your interview. There is no intent to inflict harm, and the research does not involve more than minimal risk to participants. Your participation in this study is voluntary and you can choose to withdraw from the study at any time. You may choose not to answer any question during the interview.

Interview Questions.

(1)   How would you describe technology? Please explain.
(2)   The transfer of technology from the West has had negative and positive consequences. What is your opinion about these consequences?
(3)   What do you think about developments in communications, Internet, satellite, and TV?
(4)   What is your approach toward the behavior control of citizens' access to media such as censorship or a lack of control and lack of censorship by governments?

(5)   What is your view on controlling citizens' behavior in utilizing mass media and the censorship and noncensorship from government during human liberty and life privacy? Do you believe in noticing technology sedition to people or managing the others' life and censor them? If the government makes use of censoring, isn't it kind of backward from technology in the society? How do the developing countries—such as Iran—can lead the community to increase using technology? What are the effective ways for changing the plan of utilizing technology in our country?

(6)   In your opinion, does technology cause social change, or do social factors shape technology?

(7)   What do you think is the connection between technology and values? Does technology raise questions relating to values or ethical considerations?

(8)   If you imagine future technology and its potential impact on society, are you inclined to be an optimist, a pessimist, neither, or some combination of the two?

Conclusion of Interview.   Thank you so much for taking the time to share with me your responses to the interview questions. I would be happy to answer any question you may have about the study, so please feel free to contact me. When my dissertation research is complete, I will be happy to provide you with information about its findings.

NOTE

1.   The clerics interviewed for this study are Naser Makarem Shirazi, Musa Shobeiri Zanjani, Lotfollh Safi Golpayeghani, Abdolkarim Musavi Ardebili, Javadi Amoli, Yousef Sane'I, Mohammad Hashtrudi, Seyyed Ahmad Madadi, Mohammad Mahdi Shab Zendedar, Ali Mohammadi Khorasani, Mohsen Vahid, Mohammad Ali Gerami, Mohsen Gharavian, Ali al-Qurani al-Ameli, Seyyed Mohammad Mahdi Mirbaghery, Alireza Piroozmand, Ahmad Akuchikian, Mahdi Taeb, Alavi, Mahdi Hadavi, Abolqasem Alidust, and Gharavi.

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