Importance of Indigenous Software Development in Muslim Countries

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In the name of Allah the Merciful, the Compassionate
and Peace be upon Prophet Mohammed and his family and companions

1. **Introduction** :

It is my great pleasure to address this gathering of the researchers and scholars of the field of Information Technology in relation to Islam.

Within the last few decades, a very sophisticated technological advancement has been accomplished in the field of IT. Fundamentally, such progress has been achieved due to simultaneous developments taking place in the three basic requirement for IT, which are the hardware, software and communication systems. Obviously, the aim is to pave the way for improving the standard of civilization on earth, which is now referred to it as a global village. Indeed various activities can now been carried out adequately in very simple and cheap manners. Among such activities, a great improvement has already been accomplished in the exchange of kowledge and the presentation of various cultures. No doubt, knowledge and culture are considered as very fundamental issues not only for differentiating between mankind and other types of creatures, but also for indicating the type of culture attained by the particular community. Here culture is actually based on real valued ethics and not on preventive ethics as applied for civilization. In the respect of utilizing IT, for knowledge and exposure of culture, Islamic faith must flourish instead of getting further set back due to present standard of civilization attained by Muslim Ummah as a result of lacking technological knowledge. Specifically for this reason it is very important for Muslims to become interested in the field of IT and live in the age of IT in a positive way, i.e. to interact with it, rather than isolate themselves from the rest of the world they are sharing in living in.

For centuries Muslims were leading the world civilization. Muslim scholars contributed substantially to science in various fields. The decline of the Islamic civilization few centuries ago and the rise of the western present civilization, enforced great pressure on the Muslim Ummah in the present era to react towards facing the present challenges.

The up-rise in information age within the last few decades, presents a burden for Muslim intellectuals to face new challenges in their struggle to save the Ummah from various dangerous ethical matters, as well as keeping it to follow the correct track towards returning back to a proper location it deserves among other nations in the present age, living a descent life..

The role of progress in IT, which contributes to changes in science, technology and human sciences, is great. Moreover the contribution of technology to the day to day life of individual has become clearly noticable. This gave the software a special merit into all fileds of science. Research in software development and related areas, recently, have shown great interest in natural languages processing, voice recognition, and voice composition. OCR for various languages also was and still is an active field of research. Research at least in these fields is language oriented. Hence the researchers who speak a language, as their mother tongue, are the best who can contribute to it rather than others.

Artificial intelligence , automation, robotics and other recent advances have found tremendous areas of applications in industry, home appliances, and many other areas. Progress in hardware design is nowadays much related to progress in software.

Research in human and social sciences, also have found in the advances in AI a lot of applications. Further advances in IT fields, when reflected on research in human science, will show further progress and will reshape how people would look at social and human sciences in the future. Muslims can contribute a lot in these areas, as they can look at these sciences from an angle of perspective quite different from the angle they are looked at presently.

2. Importance of Software for Muslim Countries:

Muslim countries, are now among developing countries. They face, nowadays, the challenges of development in various aspect of life. With the fast progress in the developed countries, the gap between the developed countries and the Muslim countries is widening. This put on the shoulder of all concerned people in the Muslim countries, the burden of making their full effort to narrow this gap. Rate of development in Muslim countries is an important aspect in the results of the development. Software is one tool in doing that.

Software industry has become an important tool in the development of various nations. It would be of great value to concentrate effort in modernizing, poor and less fortunate communities in Muslim countries. Software can do a lot in this aspect. Although life in Muslim countries is not as sophisticated as in developed countries, less sophisticated systems are quite enough to run the day to day life of citizens in most cases. However the necessity of software needed for human development is of far reaching importance because the tasks are much more important, due to the greivity of the situation in many Muslim countries.

Muslim countries, like many other developing countries, suffer from misinformation which leads consequently to misjudgment, and hence this in turn leads to mismanagement. The key to solve that should start from proper information; leading to proper judgment; hence proper management. With the complications in the modern life now, the IT offers the only tool available for proper information management. This should be accompanied with research in various aspects of life and commitment to scientific approach in solving the problems faced.

Muslims nowadays, after centuries of dark ages, suffer from being somehow far from practice of characters, behavior and living of true Muslims. With what remains of Islamic way of life Muslims still own lot of things to reintiate their proper Islamic life and to give a lot to the human kind. IT can help a lot in this aspect; i.e. they have also the duty of presenting Islam to the whole humanity in its true shape.

3. Imported Software versus Indigenous Software

Software is not merely nowadays a tool for performing certain jobs. It is in itself can carry philosophy, values, customs, way of thinking and social behavior in many cases.

Software is being integrated in educational system, mass media, production of films, TV series, comedy production, stories, way of management, how tasks are performed, etc.

Software development is similar in some aspects to film production industry. It contains lot of social and human values as well. Importing software with no doubt expose the nationals to ideals and values other than their owns.

Hence it is clear that indigenous software is the answer to imported software, which carry many unacceptable heritage values.

If a nation nowadays depends merely on imported food, materials, and systems, it will loose its initiative in the modern society and act merely as a receiver to the flow of ideas, goods and even way of thinking. It will loose its identity and behave in the way imposed upon her by others or by natural consequences of being an inactive in harsh environment. This will follow in shaping the growing generation in the direction of being second class citizens in the world community rather than masters of their destinies.

One of the most important fields of that is in training and education. Software now is becoming slowly and gradually, values dependent science. It includes in itself values of its originator willingly or otherwise. It is not like pure science e.g. mathematics or chemistry.
One may argue what is wrong in importing an educational program, which teaches the child the basic ideas of counting things? Of course many isolated programs may not contain obvious harm if you look at them as standing alone, but when you look at an integrated educational packages, one can easily see how values and way of thinking are being integrated in such software.

The other point view is the economical one. On one hand the indigenous software shall use local work force, which will in no doubt is reflected on national economies. Foreign software are imported using foreign exchange compared to indigenous software revenue, which shares in national economical development for the country in which it is originated.

The other point is that due to the intellectual property legislation in some countries, the foreign software is protected; and since these software are having big markets, they can be sold at much lower prices than indigenous software. Hence someway of protection indigenous software may be necessary.
Major software companies (e.g. Microsoft) have in the recent years, developed their different language editions of their major products. However, the sense of details, and proper solution

to the problems of various languages do not exist in many cases. Take for example the character sets in Arabic language set by Microsoft. Many character combinations with Arabic secondary characters (Tashkeel) cannot be visualized.

Although these software houses employ many of those who speak languages in which the software going to serve, however their tasks mainly fall in translation rather than major development of software.

The example of the progress in India in software industry is one which is to be considered as a good example. The building of software industry in Muslim countries shall prove that it is a good choice for highly competitive international market.

4. Challenges facing Muslim Ummah :

The problems facing Muslims as individuals, communities, and countries and as a whole as a one nation (Ummah) can be put into two main categories and how they are brought together:

4.1 Challenges of survival in terms of belief and religious matters:

Muslims are one nation as addressed by Almighty Allah in the Quran : **Indeed your nation is one nation and I am your Lord; therefore worship me.**

The survival of Muslims as one nation is challenged by a lot of problems. The core of the common belief, is targeted by a lot of misconceptions, misunderstandings and lack of strong pulling towards work for common goals. The behavior of Muslims as individuals and as societies, deviate a lot from many of the teachings of Islam. Unless Muslims correct these shortcomings, their nature as a one nation is challenged. Above all Muslims believe that the reason for their origin and lif on earth is, as   Allah stated in the Quran: **I haven't created Jin and human race except that they worship me**

Hence the Muslims ought to understand that duty, apply it enjoying its benefits and submit its sweet results to the humanity. Software can enhance these goals tremendously.

The main problem in this aspect is the problem of implementation and practice rather than deviation from Islamic belief (Aqeedah). It is then important to bring about the proper circumstances, which help in practice of proper Islamic teachings rather than emphasis on pure spiritual worship only or arguments of detailed scholarly different points of views.

4.2 Challenges of development and raising the standard of living of citizens:

Muslims are now facing a major social, economical and educational challenges. It is the duties of intellectuals to face these challenges by whatever means they have in hand. Software can be one of these means. Islam has emphasized the use of materialistic means based on good reasoning in all problems related to Muslims life. As the great Prophet (p.b.u.h.) put it addressing his companions: You are more knowledgeable in the matters of your life. This is in addition to many verses in Quran praising scientist and use of good reasoning and logic.

The Quran also emphasized the proper use of materials: **We also sent down the iron in which there is immense strength as well as many utilities for people.**

The example of the prophet (p.b.u.h.) of using all means of human being in his life: good reasoning, shura, proper use of materials, etc. stresses this fact in Islam.

4.3 Challenges of integration of the above two wings of life in a balanced way:

The proper balance of the progress in Islamic religious demands and the development demands in the present era, is an important matter. The two wings should go side by side in a well balanced way. All the problems of western civilization nowadays are due to that severe imbalance of materialistic based philosophy with the full negligence of the spiritual needs of the human being.

The main aspect in that is to develop scientists, educators, managers and other intellectuals personal who hold both the two sides of background: High Islamic belief and commitment to that with determination to follow scientific and modern procedures in solving day to day life problems.

The balance is one of the unique characteristics of the Muslim Ummah as Allah says in the Quran: **We made you an intermediate nation ,** following middle path with no extremism in any one direction.

5. Development of Indigenous Software in Muslim Countries

5.1 How can Indigenous Software be developed:

Software industry can be built via series of steps to make successful indigenous industry. Imported software is only natural to be an important first step. Such software needs a period and effort to be digested. Local development would come after that. This may include translation and localization. The other step is to imitate and to build similar systems. Once the confidence in indigenous systems become real, spread to various areas of applications

become natural. The key to that is the determination of the responsible people to solve the local social, economical and development problems in proper scientifically based methods. All these should be based on local research to solve various problems facing the Muslim Ummah lead by sincere intellectuals armed with good belief in Islamic ideals and determination to serve their nation in the most scientific way.

5.2 How software can serve in facing these challenges:

As software is an advanced tool, which participate in all aspects of modern society, it is an important instrument in facing these challenges. The duty to apply this, lay on the shoulders of governments, private sectors, non governmental organizations and specialized individuals. Some of these aspects can be indicated in the following fields:

5.2.1 Indigenous Software can play a major role in the development of national languages of Muslim countries:

Language is not merely an instrument for communication. It is a pot for development of way of thinking for those speaking the same language. It has been proved that imported software cannot contain all specifics of languages other than the language in which originally written (mainly English). Hence local development of software dealing with languages spoken by Muslims is of great importance.

5.2.2 In the field of bringing the Muslim Ummah together, the direct translation between languages spoken by Muslims should have top priority. Such systems may not only serve the purpose of communication between people who speak one of the two languages with those speaking the other language, but they will enhance the processing knowledge of all the languages concerned.

It should be noted that majority of the languages spoken by Muslims have a lot of common terms, grammar and concepts. They have copied lot of things from Arabic, the language of the Holly Quran which is one of the richest languages on earth.

Research in these fields, the Script in which the Quran is recorded, the introduction of artificial intelligence techniques in this field etc. All these are examples of large number of projects need to be performed in the future.

5.2.3 Indigenous software can serve in solving local problems, which the Muslim societies suffer from, in much better forms compared to imported software. National experts are much better aware of local problems and the proper remedies. Imported software may be more professional and more general, however of less benefits in many circumstances.

5.2.4 With the wide spread of the use of the world wide web, software in Muslims languages, can help in education and training of large spectrum of individuals to become more aware of the challenges facing them and to promote their abilities for betterment of their future life.

5.2.5 The plans for E-Government implementation propagated by some countries, is a way to increase the rate of modernization of Muslim countries. The application of these plans shall include many social consequences. The follow up of such social changes, need a lot of original research which can only be done through indigenous software.

5.2.6. The heritage of the Muslims can be better protected and saved for future generations by Muslims themselves. It is one thing to be a professional and another thing to have ideals to work, with whatever potential one have. The famous Arabic proverb: Your skin can never be itched like your Neil.

5.2.7 Muslim women need special plans and treatment to become more productive and to become more influential in the spiritual, social and economical development of the Ummah. At the same time they also need to be better protected from the influence of the unti-Islamic propaganda and misbehavior. One way to serve these two apparently conflicting purposes is by encouraging work at home via internet. Software to serve that purpose could be of great value.

Number of handwritten Islamic books, which are unpublished and are still in their original scripts, is huge. Great effort need to be put in serving this great heritage for the whole humanity.

6. Software to serve the cause of Islam :

Islam is the most misunderstood religion on earth. Why is that? And how to rectify the image of Islam in the eyes of non-Muslims ? Indeed it is a challenge to Muslim intellectuals and IT experts.

Proper presentation of Islam on the internet needs lot of work. Software are urgently needed to strengthen the unity of the Ummah, keeping away from issues which torn the nation into isolated islands. We need to strengthen what is common and get away from differences. Following are only some examples of what can be done in this respect:

6.1 Studies about Quran

What is available now on CD's and on the internet are good collection of texts related to Quranic text, books of tafseer (meaning) of Quran and some related books. All these (mainly in Arabic) were put in their original forms with no proper indexing nor they are suitable for data processing in most cases. There is a need for translation software for these texts to all the languages spoken by Muslims. The same can be said about the books of Hadith (tradition of prophet Mohammed p.b.u.h.) and other books of religion like Fiqh, Aqeeda , ..etc

Translation software, which is oriented towards religious texts, should be developed quickly.

6.2 Software related to verification of Islamic texts (mainly Quran and Sunnah) are not yet available. Much work need to be done. Tabulation of topics in Fiqh and fatwah are needed to be references for all Muslims and will serve in bringing Muslims together.

AI techniques need to be used deeply in this respect.

6.3 Presentation of the bright face of Islam:

Heritage of Muslims in science, technology, sociology and human science are unknown to many Muslims nor to the non Muslims. The art of Islamic civilization is still not properly addressed.

6.4 With the shortage of experts of high specialization in software, economics, and other challenging fields, why re-inventing the wheel over all the countries in the Muslim world? Take the example of Islamic Banking. All banks which are applying the Islamic no interest principles over the Muslim countries need sophisticated software for their day to day operation. Why not joining hands in supporting good universal software to serve them better? Such projects will be useful in exchanging experiences and helping the newly developed banks to grow up in a smooth way as well as better economical uses of resources. Educational software for economics based on Islamic principles need to be spread.

Othe examples for that are the Islamic insurance companies, companies based on Islamic principles of joining shares.

7. Software for serving the Muslim Ummah and Muslim countries:

There is a strong need for developing large scale of varieties of software for the purposes serving the development of the Muslim countries. Education is one of the most challenging fields. It is hard to find any field which does not need efforts in software for its development. Fields like economics, commerce, security, judicial system, human development, and many others are among fields where software is urgently needed for its development.

Software, which serve for effective development of relations between Muslim countries, is strongly needed too.

Here are some more aspects of software development which must be addressed:

7.1 Prohibited Software: One aspect, which Islam prohibits, is what result into prohibited services. An example for that: Software prepared for gambling for example is prohibited. This in accordance with the well known rule: "What leads to prohibited action is prohibited".

7.2 Software serving the intellectual products of Muslims directed towards the whole world should attract good attention. Muslims are living in this age and should interact with it in a positive way.

7.3 Software, which serve in accelerating active research in Muslim countries, need a lot of attention. Implementation of results of local research is a key solution to all problems faced by Muslims. Hence acceleration of work in these areas is of multiple value.

8. Problems facing the development of Indigenous Software and proposed solutions:

Indigenous software development faces lot of difficulties; among which are the following:

8.1 Quality of local software

Unless local software becomes of good standard, confidence in it will stay low. Hence all aspects related to indigenous software quality and reliability should carry very high priority. Software quality depends upon many factors. Some of which are:

8.1.1 Good educational and training background of programmers and software specialists are very important. This needs a good look after universities and other educational and training

institutions. Fair pay and suitable working conditions for IT specialists would also be necessary. Shortage of IT specialists has to be addressed by Governments.

8.1.2 Up to date of standard software tools

This needs good flow of up to date information to and from locations where international software are produced.

8.1.3 Good traditions in system programming

This include suitable sizes of software enterprises, indigenous software institutions corporation and relations to governments and international institutions.

Establishment of national professional societies and institutions and strong ties with similar international bodies is strongly required.

8.2 problems of piracy and copy right protection

This includes necessity to build traditions, in respect of copy right protection, development of legislation and software development for protection and software safety.

Proper follow up and implementation of legislation is important.

However, the accurate definition and the legal aspects in the field, were not properly addressed, yet, by Muslim religion scholars. Good understanding of the background by religious scholars is essential to help in this respect.

8.3 Limited market:

The market for software in most of Muslim countries is limited. Hence integration of markets of nearby countries or those speaking same language is a useful way of marketing. Muslim countries have a lot of common interests hence software exchange will solve the market limitations. Common market for Muslim countries could be one answer to that.

8.4 Immigration of specialists to the west

Brain drain is one of the big problems facing Muslim countries and other developing nations. It is facing various software enterprises as well other scientific fields. Finding solutions to this problem is very important.

8.5 High competition between indigenous software and imported software.

The cheap, high quality, and well established, software of international venders pose a threat to indigenous software. Some way of protection or local advertisements for indigenous software shall become necessary.

9. Software to serve humanity:

It is a duty of Muslims to serve not only themselves, but to serve the whole humanity. The whole world, as a result of globalization, should be looked at by specialists, as a yard for presenting to the whole humanity, what is good, and fighting what is evil.

The good presentation of Islamic principles to the whole world includes the building of software to present the good characters such as truth, patience, steadying fast, family values, balance between spiritual and materialistic needs of human being, and Islamic standard behavior in various professions.

The presentation of the values of the Islamic Civilization in all its aspects as a mean to enhance the present civilization with the missing values we are suffering from, is an important task

Among the directions, which the Muslims can contribute is the way of dealing with problems used by scientists nowadays. It is noticed that the philosophy of tackling problems in the present civilization, is by dividing it to minute pieces. The recognition of any category usually is built up from these minute pieces. This is the usual way of treating many problems including problems related to art, sociology, psychology and other human science.

Muslim scholars used to deal with such problems in different way. They used to recognize problems starting from an overall picture going to the minute parts. This is a substantial difference which need tremendous amount of basic research in mathematics, physics, social science, etc. I argue that software can serve in this direction.

In conclusion I should say that, Indigenous software development is a must both for religious purposes and for national development and means for development of such software lay on the burden of specialists in Muslim countries.

Ethics based on Islamic teachings have to be propagated by Muslims. Thy have to present these teachings also to the whole humanity.

This topic shall be addressed in further details in a paper which shall be presented later in this conference.

Finally may I extend my thank to all of you for your patience and wish to the conference all the success wassalamu alaikum warahmatullahi wabarakatuhu.