# INNOVATIVE COMMUNITY-BASED COMPUTING FOR ENTREPRENEURSHIP

**Ahmad Zaki Bin Abu Bakar**

*Universiti Teknologi Malaysia, Malaysia, zaki@utm.my*
*Qatar University, Qatar, profzaki@qu.edu.qa*

**ABSTRACT**. There are many reasons why people all over the world venture out to become entrepreneurs each year but many failed. One of the main reasons for failure is due to uninformed and lack of advice decisions and actions made by the inexperienced entrepreneurs. To support their inexperience, education, decision support systems and a virtual intelligence network could be established but these strategies have limitations. This paper discusses the possibility of using community-based computing to support entrepreneurship and how entrepreneurs could benefit from the collaboration.

**Keywords**: virtual intelligence, community informatics, entrepreneurship

## INTRODUCTION

There are many reasons why people around the world want to become an entrepreneur. It could be for financial reasons stemming from a necessity or an opportunity that spur them to create wealth that will be impossible to amass if they are working for somebody and earning a meager salary. It could be for career independence because they hate their boss and do not want their principles and life style to be dictated by someone else or the organization rules and regulations. It could be due to job scarcity or career satisfaction. It could also be for the challenge or the inspiration by the success of many other entrepreneurs.

Whatever the reasons, many hopefuls venture into business every year. According to the Global Entrepreneurship Monitor 2010 report (Kelly et al, 2011), 110 million people between the ages of 18–64 years old are actively engaged in starting a business while another 140 million are running new businesses they started less than 3 ½ years earlier. However, becoming an entrepreneur does not mean the need to own a business. *Entrepreneur* is an old French word meaning "one who undertakes an endeavor". Entrepreneurship is thus the act of being an entrepreneur. So who ever takes initiatives to create changes and innovation that causes a positive impact on an industry can be called an entrepreneur. This concept is actually used in the computer industry. In 1982, on the occasion of its thirtieth anniversary, the IEEE Computer Society established the Computer Entrepreneur Award to recognize and honor individuals whose entrepreneurial leadership is responsible for the growth of some segment of the computer industry. However, an entrepreneur is more precisely defined as an innovator and risk taker who strives to create products that will profitably satisfy the needs and wants of a particular segment of a market.

The computer or Information Communication Technology (ICT) sector certainly has many entrepreneurs. The Global Entrepreneurship Monitor states, "most policymakers and academics agree that entrepreneurship is critical to the development and well being of society. Entrepreneurs create jobs. They drive and shape innovation, speeding up structural changes in

the economy. By introducing new competition, they contribute indirectly to productivity. Entrepreneurship is thus a catalyst for economic growth and national competitiveness" (Kelly et al, 2011).

For such an important contributor to economy then the tools for entrepreneurship is expected to be well established. Unfortunately this is not the case and every year many entrepreneurs fail before being able to achieve their goals especially in the early formative years. Poor decisions making is one of the highest reasons of failure. The impact that each decision an entrepreneur makes may have on the ultimate survival of the business and how easily a new business can fail (Kampschroeder et al 2008). The issue at hand is how entrepreneurial decisions making be improved?

## IMPROVING ENTREPRENEURIAL DECISION MAKING

If you are an entrepreneur just starting to venture out then you will find yourself swarmed by many hard and pressing issues requiring quick and right decisions. The issues could relate to financial, procurement, human resource, technology, production, marketing, revenue generation and one million other things that you have no prior knowledge or experience to rely on. If you have been working in an organization before then these decisions were made collectively by the Decision Making Unit or by the higher authorities. Even if you used to be part of the decision making process it was a collective decision. Now, your decision to have freedom as an entrepreneur also means taking sole responsibility for your business decisions. The mistakes you make in a big organization does not have much effect due to its organizational strength but for a small startup it is disastrous and may lead to certain death. So throughout the ages, many attempts have been made to improve this decision making process.

For educational institutions around the world including Universiti Teknologi Malaysia (UTM), subjects and special programs on entrepreneurship are run to create more entrepreneurs or technology entrepreneurs (technopreneurs) in the belief that entrepreneurs can be bred versus the notion that entrepreneurs are born. ICT schools and faculties inspired by the success of well known ICT entrepreneurs like Kenneth Olsen, Steve Jobs, Bill Gates and Michael Dell have ICT Technopreneur or Cyberpreneur programs to create future Bill Gates and Steve Jobs. The idea here is to educate and expose the potential technopreneurs to the ICT business industry and for them to develop hardware and software prototype products for real markets but in sheltered and well supported incubators. When they graduated they are more equipped to face the challenges and harsh reality of the ICT business industry compared to those that took the brave but naïve step of jumping straight into business. Even with the extensive preparation, the technopreneur graduates were found to not able to handle the harsh realties. Many blunder through many decisions with disastrous consequences.

For many academics, researchers and ICT companies, if the educational track is not effective then technology seemed to be the most appropriate answer to the decision making issue. Decision Support Systems (DSS) with Artificial Intelligence engines have been developed in the past to assist in the decision making process in many organizations. So the assumption here is it should be relatively easy to port the DSS for big corporate organizations to small startups. Combined with several business productivity tools, we should be able to create a Small Office Home Office (SOHO) for entrepreneurs. But it was not the case. Compared to big and matured organizations where the decision making process are more defined and well understood as well as supported by the abundance of policy and regulations, small entrepreneurial organizations are not well understood. The issues confronted in small startups are normally complex, unstructured and in most cases totally new depending on the areas the venture is exploring. The decisions require creativity and innovation as well as very much dependant on the leading entrepreneur thinking style. Policies and regulations have not been setup and in most cases are regarded as not important in the early stage of the organization life cycle. All these undermines the basis of a rule-based DSS.

No doubt, DSS SOHO certainly has a promising future in the business startup market. Unfortunately it is still not available for the entrepreneur. Research and development efforts should be undertaken to create and develop robust and intelligent DSS to support entrepreneurship. Since entrepreneurship is a mystery for many ICT developers then a good start is to understand the entrepreneur self.

In my own professorial inaugural lecture on 24 May 2003 at UTM, I propose the concept of the Human Virtual Intelligence Framework (Abu Bakar, 2003). In this concept, I propose a framework for a leader to utilize his or her five intelligences. Humans throughout the ages have always stressed on the importance of the Intellectual Intelligence qualities to signify the cognitive capability of a person. We measure a person's intelligence through his or her Intelligence Quotient or IQ. Only recently, the concepts of Emotional Intelligence (Goldman, D., 1996, 1998, 2001, 2006, 2009) and Spiritual Intelligence (Zohar, D, 2000) have been identified to be as equally important to a person's cognitive capability. You too can measure a person's Emotional Intelligence by an Emotional Quotient (EQ) or Spritual Intelligence by a Spritual Quotient (SQ).

To support the inadequacies and limitations of his intelligences, human has resorted to providing Artificial Intelligence to machines or computers. There are many successes to this fourth intelligence endeavor and many intelligent systems with machine intelligence are already being used in our daily lives. Our discussion on the use of a DSS is inline with this belief. Even so, humans actually have a bigger and more powerful fifth intelligence at his disposal called Human Virtual Intelligence (HVI). This HVI has not been fuly understood and as such has not been fully unleashed and used as a crucial competitive cognitive advantage.

HVI is based on the concept of collaboration by knowledge agents in an intelligent learning organization and transcends virtual corporations. Knowledge agents are the human capital or community surrounding the human. They are family members, relatives, friends, business partners, consultants, employees, bankers, venture capitalist, legak advisors, suppliers, customers and even competitors. Each knowledge agent by themselves has HVIs. If this community of human agents can be networked virtually through face-to-face meetings, correspondence and ICT then an extensive collaborative network of human wth HVI is created. Imagine the possibility of this collective brain.

As its name implies, this intelligence does not physically exist but only exist virtually. If used wisely, the human or entrepreneur has this powerful virtual intelligence at his or her disposal to assist in business decision making and getting things done. The entrepreneur still has to make the final decision and take actions but they are now more informed and calculated risks. The probability of failure or a wrong choice is still there but it is better than jumping over a cliff with your eyes close. Recovery processes could quickly be initiated to minimize losses.

In the HVI, the knowledge agents in most cases are willing to assist the entrepreneur because of their personal relationship. The knowledge agents such as family members, relatives and close friends will assist the entrepreneur based on their love and close personal relationship. In a sense, they are motivated to support the entrepreneur based on their emotional intelligence. The non-personal knowledge agents on the other hand, are motivated by their intellectual intelligence to assist the entrepreneur. This could be due to their close business working relationship and experience so long as it is in line with their own business or personal agenda.

To ensure this virtual intelligence is strong and operational, the entrepreneur must take a lot of efforts to maintain and service this network. This could be done by socializing and even by giving financial incentives. People are motivated differently and it is the task of the entrepreneur to understand each knowledge agent and know what their needs, requirements and wishes are, so that he can act accordingly.

Unfortunately, after a lot of effort, the size of the virtual network is very limited and confined to the entrepreneur socializing capabilities, motivational skills and incentives. The quality of the decisions made too depends on the quality of advice or information given by the knowledge agents in this personal virtual network. Quality and well-informed advices come from quality agents and this is a big issue for budding entrepreneurs who does not have the time, contacts, finance and other resources to get quality knowledge agents like business, lega and technology advisots or consultants to work for them. Interestingly, development in mass collaboration, Wikinomics and the rise of the social media could solve this issue.

## WIKINOMICS CROWD SOURCING

Mass collaboration was proposed by Don Tapscott and Anthony D. Williams in their book titled, *Wikinomics: How Mass Collaboration Changes Everything*, published in December 2006 (Tapscott and Williams, 2007). The title of the book, Wikinomics derives from the concept of a wiki or Hawaiian word for 'quick' in which individuals participate to co-create a product. Wikinomics explores how some companies in the early 21st century have used mass collaboration or peer production and open-source technology or wikis, to be successful. The most notable example of a wiki is the Wikipedia where more than eight million writers around the world participated in creating the biggest online encyclopedia. The four principles of Wikinomics are openness, peering, sharing and acting globally. Tapscott and Williams have recently released a follow-up book to Wikinomics, entitled *Macrowikinomics: Rebooting Business and the World*, which was released on September 28, 2010 (Tapscott and Williams, 2010). .

One of the strong elements advocated in Wikinomics is the concept of mass collaboration that includes crowdsourcing. Crowdsourcing is the act of outsourcing tasks, traditionally performed by an employee or contractor, to an undefined, large group of people or community (a crowd), through an open call over social media. The use of the term has spread to include models where discrete work is distributed to individuals within the crowd. Social media are media for social interaction, using highly accessible and scalable web-based and mobile technologies to turn communication into interactive dialogue.

Jeff Howe (2006), one of the first authors to employ the term, established that the concept of crowdsourcing depends essentially on the fact that because it is an open call to an undefined group of people, it gathers those who are most fit to perform tasks, solve complex problems and contribute with the most relevant and fresh ideas. There are several perceived benefits of crowdsourcing. With crowdsourcing, problems can be explored at comparatively little cost, and often very quickly. Financial incentives or rewards are by competition or results. In most cases there are no financial returns promised. By crowdsourcing, the organization has access to a wider range of talent and ideas that are beyond the confines of the organization and even country. Crowdsourcing gives opportunity to get views from the public and customers needs that can be used in marketing. Crowdsourcing are also good for building and fostering brand names and loyalty.

There were of course many skeptics. How could this phenomena be happening? Can a crowd of unconnected people from various locations in the world produce great works that could not be solved by a dedicated team? James Surowiecki (2004), in his book *The Wisdom of Crowds*, examines several cases of crowd wisdom at work, where the very success of a solution is dependent on its emergence from a large body of solvers. So the phenomena is real and we are actually experiencing it every time we surf the Internet. If you see a request for a poll then that is crowdsourcing in action.

## ENTREPRENEURIAL CROWDSOURCING

Back to the issue of finding quality knowledge agents for entrepreneurship, the answers seemed to lay in utilizing social media for crowdsourcing entrepreneurial decisions. To enhance the personal and closed human virtual intelligence of the entrepreneur and get creative and quality solutions to a difficult business issue, an open appeal can be made through the popular social media like Facebook, Linkedit, etc. The call is to entice anyone in cyberspace to contribute in providing advice, recommendation and even solutions faced by the entrepreneur. You will be surprised by the response. It seems that there are many people out there that care. The interesting thing about this strategy is that the knowledge agents from this process could come from anywhere in the world and normally without any cost to the entrepreneur.

A smaller community of avid contributors will eventually emerge from the crowd after several appeals. This small community could then be utilized discretely for more specific tasks with of course some financial incentives. From this exercise, different communities could be identified and utilized for different issues and tasks. In essence the size and nature of the virtual intelligence network will fluctuates with time and tasks. Basically the problem of getting quality advice for the entrepreneur is hence solved. All you need to have is access to a social media site and be part of the community.

## CHALLENGES OF CROWDSOURCING

If you think everything is fine then please reconsider because there are actually many issues related to crowdsourcing. Crowdsourcing like other strategies has its own weaknesses. Eric Schonfield in his article in TechCrunch (Schonfield E., 2008) said, “Crowdsourcing sounds good in theory—pull together a bunch of smart, motivated individuals from across the Web to create a new product or business—but in practice it is not so easy to pull off”. His article described a crowdsourcing company in Canada that failed because the output from the outsourcing initiative relied heavily on a few community members and this made them very diffused.

They are certainly many issues and challenges. Let me list ten. One, many crowdsourcing initiators assume that their community or the crowd will automatically care about their cause and willingly assist their plight. While there is some interest in the problem, in most cases there have to be more substance, compelling reason or urgency for a community to want to act on the issue. Two, the problem must be clearly defined, focused or trivial for the crowd to effectively respond. Crowd mentality is simple with a short attention span. Three, difficult or complex problems require many hours of hard work and dedicated resources that the crowd is not willing to commit unless there is a clear tangible reward. With no clear incentives, the crowd can quickly sense a cheap attempt to exploit them. Four, how do you know whether the idea given by the crowd is good? The quality of the solution is dependant on the quality of the problem solvers. In crowdsourcing, you do not know the real identity and credentials of the crowd because it is common practice to have pseudo identities or avatars to represent yourself in cyberspace. Five, the crowd might not have the correct technical background or subject matter expertise to solve the problem effectively. Six, there is also a possibility of a group think phenomena in action and they falling to the Condorcet's jury theorem. This is a political science theorem about the relative probability of a given group of individuals arriving at a correct decision. Seven, how do you maintain secrecy or control of your idea over a public or open network? Your business competitor might be on of the crowd. Eight, crowdsourcing like all trends or fads will fade when the novelty wears off. So creativity and innovation has to be employed to maintain the crowd’s interest. Stale ideas or already solved problems will put many people off. But what is the crowd current interest? Nine, there are too many sites employing crowdsourcing that made the crowd diffused and extremely picky. Ten, building trust and a strong community require time, patience and innovative strategies that many

entrepreneurs do not have.

So are we back at square one? Certainly not, one realization of working on enhancing the virtual intelligence is that the entrepreneurs should not be working alone but must work as a community. Hence, community entrepreneurship should be the norm. Since ICT is a necessary tool for the success of the entrepreneurship then Community Informatics too is an area to be explored.

## ENTREPRENEURIAL COMMUNITY INFORMATICS

Responding to the nature of communities in the innovation era, a new knowledge discipline has emerged. According to its journal, "Community Informatics (CI), also known as community networking, electronic community networking, community-based technologies or community technology refers to an emerging field of investigation and practice concerned with principles and norms related to information and communication technology (ICT) with a focus on the personal, social, cultural or economic development of, within and by communities. It is formally located as an academic discipline within a variety of academic faculties including Information Science, Information Systems, Computer Science, Planning, Development Studies, and Library Science among others and draws on insights on community development from a range of social sciences disciplines. It is a cross- or interdisciplinary approach interested in the utilization of ICTs for different forms of community action, as distinct from pure academic study or research about ICT effects" Gurstein, M. (2007).

I believe Community Informatics research will provide more solutions to answer the issues in implementing a computing system for a virtual intelligence for entrepreneurship. In this field the various aspects of the virtual and physical communities are studied in depth to provide insights into the nature of the communities. We need to understand more about community dynamics before we can make effective systems for them and the future is certainly more towards working in communities.

## DREAM SYSTEM

I have a vision for an intelligent DSS SOHO community-based computing system for entrepreneurship. The computing system should have connectivity to traditional and social media sites. With business productivity tools, the entrepreneur can get work such as sending quotations and invoices to be done in a short span of time. When in need of quick advice, the entrepreneur can directly call or e-mail his personal virtual intelligence community. For harder issues, the crowdsourcing method will be used. However, crowdsourcing appeals could only be made after a through search has been done by a data mining system to find and ensure that the problem has not been answered before.

Problems, answers, actions and experiences should be stored and managed by a knowledge management system. The problem too should be defined more clearly by a problem composition system. The draft problem can then be sent to a smaller community identified by the system for advice and recommendations. The final appeal would then be sent to a social media site indentified by the system based on certain criteria. This will ensure a higher response from the knowledge agents from the crowdsourcing exercise.

The knowledge management system component will have profiles of knowledge agents and classify them into various categories. The system will remind the entrepreneur on his responsibility and actions to maintain and motivate his knowledge agents. In essence this could be functioning similarly to what is happening in a multilevel marketing system where finally a personal touch is needed. With such as system at his disposal, the entrepreneur could then focus on his or her business and make more intelligent decisions. Imagine the possibilities.

## CONCLUSION

Entrepreneurship is an important element in the growth of an economy but does not have many support systems. In this paper the idea of an innovative community-based computing system for entrepreneurship is proposed utilizing works and ideas the author has personally been involved. It is up to the reader to ponder on the idea and maybe attempt to develop such a system. It won't be easy but the possibilities are enormous.

## REFERENCES


Abu Bakar, A. Z. (2003). Virtual Intelligence and Knowledge Management: The Key to Success in the Knowledge-Based Economy, Monograph, Universiti Teknologi Malaysia Professorial Inaugural Lecture –Series-8, Penerbit UTM Press.

Goleman, D. (1996). Emotional Intelligence: Why It Can Matter More Than IQ, Bantam Books. ISBN 978-0553383713.

Goleman, D. (1998). Working with Emotional Intelligence, Bantam Books. ISBN 978-0553378580.

Goleman, D. (2001). The Emotionally Intelligent Workplace, Jossey-Bass. ISBN 978-0787956905.

Goleman, D. (2006). Social Intelligence: The New Science of Social Relationships, Bantam Books. ISBN 978-0553803525

Goleman, D. (2009).Ecological Intelligence: How Knowing the Hidden Impacts of What We Buy Can Change Everything, Broadway Business. ISBN 0385527829, ISBN 978-0385527828.

Gurstein, M. (2007). What is Community informatics? (And Why Does It Matter), Polimetrica, Milan.

Howe, J. (2006). "The Rise of Crowdsourcing". Wired. Retrieved 2011-02-19. http://www.wired.com/wired/archive/14.06/crowds.html.

Kampschroeder, K F. Ludwing, N., Murray, M. A., Padmanabhan, P. (2008). The Stitch House: A Case Of Entrepreneurial Failure, Journal of the International Academy of Case Studies, Retrieved from http://findarticles.com/p/articles/mi_qa5452/is_200803/ai_n27899944/.

Kelley, D. J. Bosma, N., Amorós, J. E. and Global Entrepreneurship Research Association (GERA) (2011). Global Entrepreneurship Monitor 2101 Global Report, Retrieved from http://www.gemconsortium.org/download/1298220216523/GEM%20GLOBAL%20REPORT%202010rev.pdf

Schonfield, E. (2008). When Crowdsourcing Fails: Cambrian House Headed to the Deadpool, TechCrunch. Retrieved from http://techcrunch.com/2008/05/12/when-crowdsourcing-fails-cambrian-house-headed-to-the-deadpool/

Stillman, L. and H. Linger (2009). Community Informatics and Information Systems: how can they be better connected? The Information Society 25(4).

Surowiecki, J. (2004) The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations. New York: Doubleday.

Tapscott, D & Williams. A. D. (2007). Wikinomics; How Mass Collaboration Changes Everything. New York: Portfolio Pub. Co. ISBN: 1591841380.

Tapscott, D & Williams. A. D. (2010). Macrowikinomics: Rebooting Business and the World. New York: Portfolio Pub. Co. ISBN: 978-1591843566.

Zohar, D. (2000). SQ: Connecting with Our Spiritual Intelligence, London: Bloomsbury Publishing PLC. ISBN 1-58234-044-7

Zohar, D. (2000). SQ: Spiritual Intelligence, the Ultimate Intelligence, London: Bloomsbury Publishing PLC. ISBN: 9780747536444.