Collaborative Value Engineering:
Creating a Global VE Network using Wiki

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Abstract

Networking and collaborative work are very important in improving team performance since all kind of experiences can be shared by heterogeneous Value Engineering Practitioners with different needs and ideas. Journals and conferences are typical connecting nodes for these networks and wikis are also the new type of arena -available from Web 2.0- where VE related collaborative work can be improved. Here is a proposal of a platform that will be very useful for VE practitioners as well as the academia to share, discuss, improve and standardize the performance of VE Teams by having a platform containing collaborative information such as VE theory, savings records, lists of ideas used to improve functions and team performance experiences.

Keywords

Collaboration, Clusters, Collaborative Work, Wiki, Web 2.0, Collaborative Value Engineering,

Introduction

Telectroscope might be a relatively new word for the reader as it was for this me. The Telectroscope is a remarkable experience that is getting more and more attention than was expected. What started as a piece of art might become a symbolic social breakthrough in the way groups interact. The story tells that the Telectroscope is an optical device conceptualized by Alexander Stanhope St George in London during the last 15 years of the 19th century (the story is fictitious, it goes together with a piece of art). The idea was to develop a visual amplifier by means of a complex configuration of mirrors inside each of its two sides, allowing people to see through a tunnel of immense length, let's say, from one side of the world to the other (www.tiscali.co.uk/telectroscope/home.php). Some years ago, Alexander's great-grandson Paul St George, accidentally found the notes and sketches of this device. Since Paul is an artist who makes the viewer interact with his art, he decided to make the concept real.

Today Paul's Telectroscope is displayed (and working!) in both London and New York, connecting both sides of the globe just as his great-grandfather dreamed about. He certainly did not use "a complex configuration of mirrors", but satellites, cameras and electronics. The result has been really interesting, since the attractiveness of the device to the people was remarkable, and now large queues of people are waiting in the line to have an opportunity to interact in

real time with people on the other side of the planet. Schools are now scheduling to use it coordinately in both sides and even couples are asking for marriage by means of the "device for the suppression of absence", as his creator (Alexander) described it.

I selected the Telectroscope as a sample of what I want to introduce as "GIB" (*Gadget-Interaction Breakthrough*), meaning that an individual (or small group of people) create a new idea (the gadget) that may be a tangible good (The Telectroscope), an experience (like Starbucks), a web page (like Amazon.com and Youtube.com), or even a set of regulated activities that invite some other people to interact (like in American Idol); the key here is that the gadget will be used in collaboration (the interaction). The Telectroscope is the *gadget* that Paul St George and his sponsors created, and the *interaction* started just as the device was set beside the Thames (near the Tower Bridge) and on Fulton Ferry Landing (by the Brooklyn Bridge) in New York. Many interactive gadgets have resulted in an overwhelming participation of a group within society, and that response is what I call a breakthrough here.

These three paragraphs are the explanation of one among many similar events that are happening in the world today, showing that globalization and the increasingly fast evolution of technology have changed the face of the globe, not only in economics but also in the way people interact, as GIB's have shown over the past years.

In this document I will present a solution that is expected to become a gadget for Value Engineering Practitioners (VEP) to interact -similar to the Telectroscope users. This is called Collaborative Value Engineering (CVE). This is a new application of available standard tools for collaboration among Value Engineering Practitioners. In order to understand its value, concepts like *non-geographical clusters, collaborative improvement* and *Web 2.0* shall be introduced.

Geographical and Non-Geographical Clusters

Michael E. Porter introduces his 1998 article for the Harvard Business Review, *Clusters and the New Economics of Competition,* stating that "now companies can source capital, goods, information, and technology from around the world often with the click of a mouse". The result, as he states, is that "anything that can be efficiently sourced from a distance through global

markets and corporate networks is available *to any company*; therefore it is essentially nullified as a source of competitive advantage"; as a consequence, location itself will diminish its importance as a competitive advantage (Porter, 1998). As a token we can have the case of Hitachi Global Storage Technologies (HGST), located in el Salto, Mexico (about 15 miles away from Guadalajara). This was originally IBM's Storage Technology Division (STD) but Hitachi bought the sliders manufacturing facility on December 31st 2002 for 200 million dollars. Five years later, HGST announced in March 2007 that they will move the totality of their works in Mexico to the Philippines by 2008. The reason was simple; it is now very easy to source the sliders with the same quality, in a relatively acceptable lead time but with a remarkable difference in labor cost. Location was not a competitive factor for the Mexican facilities that produced about 60% of Hitachi's sliders worldwide. (Gutierrez, 2003)

The reader may recall his/her own close encounters with similar cases in the last few years, this is happening all around the world because of globalization. But do not misread these lines, my intention is not to create an idea that globalization is leading economies to crash; on the contrary, I believe, as many do, that it is shaking stagnant regions and their economies to wake up and innovate.

Speaking about innovation, many geographical regions are successfully working to change the loss of recognition of their location -due to the efficient sourcing mentioned- by creating *clusters*. Clusters are "geographic concentrations of interconnected companies and institutions in a particular field" (Porter 1998). These do not only group companies from the same field, but also include suppliers, government, specialized labor available, universities and more. Las Vegas is a clear example of a cluster in which organizations are focused around casinos, or the Silicon Valley for electronics, Cancún or Rome for tourism, Toyota City or Detroit for automobile manufacturing, or the city of Tequila that gave the its name to the well known product manufactured there.

In the case of Tequila, just to use a local example this author happens to like, we will find several manufacturers for the different brands of Tequila: Sauza, Cuervo, Herradura, Cazadores, Don Julio, Jimador, Orendain, San Matías, among many more. But around these factories are several land owners and *jimadores* growing and harvesting *Agave Tequilana Weber,* the source from which tequila is distilled. (Jimadores are specialized men that cut the long and pointy leaves of the agave using a special cutting tool called *jima*). Agave takes seven years to grow so there are institutions specialized in forecasting long term demand, some others are promoting the consumption of tequila worldwide or doing research about better ways to grow agave more efficiently. There are also restaurants, bars, tours and museums in the city, all around the business of tequila. This is a very clear example of a given cluster in which collaboration among different types of organizations and government levels in the same region spots its location on the map.

A cluster is then an organized structure for collaboration. *Collaboration* is a process in which a group of autonomous stakeholders of an issue domain engage in an interactive process, using shared rules, norms, and structures to act or decide on issues related to that domain (Wood and Gray, 1991). Even though the definition of cluster is location-oriented more than collaboration-oriented, if the cluster is to strengthen and grow, collaboration among these stakeholders is a must-be for "interconnection" among them, even if they are competitors.

How a cluster affects competition is summarized in three ways: it will result in a continuous incremental productivity, also a continuous incremental innovation and finally result in an expansion and strengthening of the cluster itself (Porter, 1998). (I recommend the reader to get into Porter's work to go deeper into each of these three ways). These are the result of an evolution of the collaboration over time within many organizations (or stakeholders) from *intra-firm* processes of collaboration into *inter-firm* processes of collaboration (Boer and Fisher, 2006). Cagliano et al. name this *Collaborative Improvement,* and define it as "a purposeful inter-company interactive process that focuses on continuous incremental innovation aimed at enhancing the *Extended Manufacturing Enterprise* (EME) overall performance" (Cagliano et al., 2005). The reader may think of an EME as a manufacturing-oriented cluster if we follow the same vocabulary we have been using up to now in the document.

Another chain of facts will help us close the idea of this first section of the document: Value Engineering Practitioners (VEP) are scattered around the globe, working for very heterogeneous industries such as medicine, construction, manufacturing, academia or the military. Even, among those working within the same type of industry we may be competitors. From this point of view along with Wood and Gray's concept of collaboration, we can conclude that SAVE International is the cluster that engages global stakeholders (VEP's) for Value Engineering's Body of Knowledge and expertise (the issue domain) in an effort to boost interaction among them to act or decide on issues related to the Value Methodology.

Here, it seems obvious that the definition of cluster will not allow considering SAVE International (or any other global group of experts) to be a cluster if we literally read the words "geographic concentrations" from it. Nevertheless, new technology has made communication among peers very simple and effective, regardless of location. Speaking of the Value Methodology Body of Knowledge, it is obvious that no VEP is expecting one single town (geographically speaking) to be the cluster for VE. It is against one of the goals of every VEP group: to promote the use of the Value Methodology worldwide.

These non-geographical clusters exist in fact, but their results in achieving the three competitive improvements -incremental productivity, innovation or the strengthening and expansion of the non-geographical cluster- have not been as successful as for those location-oriented clusters. I've been part of some of these special type of clusters even before I think of them as clusters; and felt -together with some colleagues- that something was missing to achieve the results we where expecting from the interaction processes. Starting on March 2007, I volunteered to become part of the Board of Directors in a newly formed professional chapter of the Institute of Industrial Engineers (IIE), and the possibility of reduced team-

performance problem was the idea that kept the mind of the four founders very busy. It was important for us to be aware that there was a risk in creating a group with a limited result from the interaction among its members. About three months later I read Ginger Adams' letter to the editor at the Interactions magazine in June 2007 and concluded that also VEPs had the same feeling and urge about it.

Location -geographically speaking- simplifies the interconnections among stakeholders, and as a result collaboration is more effective. This is not the case for non-geographical clusters since the members of the cluster might be physically distant, in many occasions in different countries. This limits the frequency and effectiveness of collaboration. Magazines and journals are a typical frequent communication channel for these groups, but they are one-way communication, limiting interaction –key to collaboration-. On the other hand, conferences and meetings are good for interaction, but they are limited in frequency in this type of clusters due to distances and members' agenda. In conclusion, efficiency and effectiveness of non-geographical clusters is limited because they lack an adequate platform for distant stakeholders to collaborate. Nevertheless, globalization itself has developed new tools useful to create effective platforms for collaboration. Web 2.0 and its tools are one of these sets of solutions available.

"The W-word": Understanding the Web 2.0 and Wiki

Fumero and Roca define Web 2.0 as the Net (Internet) transformed into a social space that embraces all social agents, capable of supplying support and being part of a new communication, knowledge and information society" (Fumero et al, 2007).

Web 2.0 is not to be understood as an "upgrade" from Web 1.0, but as the creator of the Web 2.0 concept Tim O'Reilly said, it is the web becoming a platform. It is no longer a place to find information but a platform for people to publish and interact around those published things (Hodder, 2007). No librarian would allow their visitors to edit the books on the shelves, right? Well, that would be the idea of Web 1.0, where people just read what some experts wrote and some other expert librarians decided to put on those shelves. In this environment changes in knowledge happened in very slow motion. In other words, Web 1.0 is the *static web*. On the other hand, one of the Web 2.0's distinguishing features from other internet websites is this frequency of updating -often daily- (Sandars, 2007). So, Web 2.0 is also called the *Social Web*; here the Net is only the platform for everybody to broadcast and interact among each other. Many tools from Web 2.0 are widely known (even though the reader might have never heard about Web 2.0): Blogs, instant messaging, wikis, RSS feed are some examples.

Wikis are collections of Internet Web based pages that are linked together, and they can be created or edited collaboratively by anyone who has access to them without having to learn HTML -hypertext markup language (Farmer 2006). Collaborators can add new content, edit existing content, add links to known Web sites on the Internet, and create and link to new pages within the wiki. They also can add graphics, video and audio files, calendars, and chat features (Siegle, 2008).

The first wiki was created by Ward Cunnningham in 1995. He named it "Wiki Wiki Web" after the Hawaiian work "wiki" that means "quick". Wikis are now one of the most important and powerful collaboration tools available at Web 2.0. Nevertheless, it is misused and misunderstood by most of the Internet users. Roszkievwicz claims that "wiki has an identity problem" because of two reasons: first "The underlying technology is available as an open source and without a strong company-backed marketing effort to tell the wiki story over and over". The second reason is "Wikipedia and its overwhelming popularity". He argues that "the Wikipedia application has co-opted the wiki technology and it is strongly identified with it" (Roszkievwicz, 2008).

Not few schools and universities have banned the use of Wikipedia as a reference for research because of the *all-may-edit* characteristic of this democratized encyclopedia. The fact that any person with access to the Web can edit Columbus' biography and state that he was a descendant from the Tlaxcalteca Indian Tribe (as an academic known to this author actually did, as part of an informal experiment), makes professors and researchers hesitate on its reliability. Keen Andrew wrote a book named "The Cult of the Amateur" criticizing this situation and stating that quality of knowledge is at risk because of this democratically written Encyclopedia. He argues that precision of information may be at risk and that serious subjects will receive less attention than superfluous popular themes. On the other hand, Ori Brafman wrote "The Starfish" in which he states the potential benefits of Web 2.0 tools arguing that non centralized collaboration may boost the development of content and refine it. An interesting discussion panel presenting both points of view was moderated by Mary Hodder at Berkley in 2007, and it is a good sample of the actual diverse opinions on this matter.

In defense of Wikipedia some state that user's errors will be corrected by other users, even if these errors are intentional. It is like the *broken windows theory of crime* –"if you keep replacing the shattered Windows, eventually the vandals will quit tossing rocks at them" (Miller, 2008). Besides, in the overcoming of the uncertainty academics and experts feel about the community-created material, Meredith Farkas states that "The crowd isn't always right but neither is the expert" (Seigle, 2008). All this arguments are the reason I named this section "*The W-Word",* since so many people feel uncomfortable with the idea of wiki.

Even though Wikipedia is not the whole concept of wiki but just a single application of the wiki technology to construct one encyclopedia, and that it is not the object of study for this paper, it is important to learn the arguments in favor or not around it before considering the use of wiki for any other function. The same arguments may arise if the reader gets into the idea of using them as a platform for any project –I will do it so in this work. Michael Stephens did some questioning when he was doing his doctoral research on why librarians blog (blogs are another collaboration tool from Web 2.0). He found four main reasons: 1) It is an easy-to-use tool that improves communication among

librarians 2) it allows open comments that would allow discussion –human interaction- 3) you can tell your story because you'll certainly have "cool" things to say 4) the voice of individuals is important (Stephens, 2007). These are human needs that seem to find some sort of satisfaction by means of Web 2.0 in these internet-based communications available today.

The main idea for this paper is that if a wiki is correctly managed it will be a powerful tool for collaborative work, and the wiki itself will become a "shared depository of knowledge" (Siegle, 2008) where everybody can post and share the parts and bits of information each possesses, resulting in a wonderful set of knowledge shared by those who have access to it. About the benefits of using wikis in organizations, Jimmy Wales – the founder of Wikipedia- states that "one advantage is that it lets innovation spread by overcoming the fundamental problem of getting information to people who need it across an organization" (Cone, 2005). But, how to overcome the risks stated by critics? There are a couple of solutions for this purpose I will present.

In his document "Working with Wikis", Siegel excellently summarizes some standard site management settings that would be an initial solution to the problem:

1. When a wiki site is created, the user is asked to *set a security leve*l. Three participation levels are usually available: **public** -everybody can view and edit the pages, **protected** -everyone can view the pages, but editing is restricted to certain individuals; and **private** -only selected individuals can view and edit the pages.
2. Wiki software *tracks when members visit the wiki* and *what actions* they take.
3. One impressive feature of wikis is that every version of the page is saved, and a record is kept of who made what changes. With this, deviant behavior can be tracked through the archival record, and the wiki can be returned to its *premalicious* state.

There is another interesting study related on assuring the trustfulness of knowledge based on wiki based articles. Dondio and Barret developed a mathematical model followed by an experiment on the trustfulness of the content within Wikipedia. The results are out of the scope of this paper since Wikipedia is not the object under study, but wikis. Nevertheless, in their publication they presented a set of rules for achieving articles' trustworthiness that became a must-be in the Collaborative Value Engineering proposal to follow. Here I present a set of ten prepositions that state that trustfulness increases if an article…

1. was written by expert and identifiable authors
   (The problem of authorship uncertainty is easily solved with this)
2. has similar features or it is complaint to a standard in its category
   (To overcome the problem of accuracy of information)
3. there is a clear leadership/direction in the group directing the editing processes and acting as a reference
4. there is no dictatorship effect, that means that most of the editing reflects one person's view.

5. the fragmentation of the contributions is limited: there is more cohesion than dissonance among authors
6. has good balance among its sections, the right degree of details, it contains images if needed, it has a varied sentence structure, rhythm and length.
7. it is constantly visited and reviewed by authors.
8. is stable
9. uses a neutral point of view
10. the article is well referenced

By setting the right parameters when designing the collaboration rules and parameters in any wiki, as well as restricting editing rights in it would allow a collaborative site to be a reliable source of information to VEPs and the world. This paper's purpose is to present a wiki-based platform that will allow VEPs to collaborate taking into consideration what has been mentioned up to now in this document. This idea's name was already introduced: Collaborative Value Engineering or CVE.

Collaborative Value Engineering

Collaborative Value Engineering CVE is a platform for Value Engineering Practitioners VEP to collaboratively interact on issues related to Value Engineering as well as sharing their individual expertise, in order to enrich VE's Body of Knowledge while it promotes the use of Value Engineering worldwide. Its goals are (as published on the site):

1. *Save time generating ideas:* Even though the process of generating new ideas at the Creative Phase is very powerful to set up the mind for innovative solutions, there might be some situations where spending time to find out how to do something someone else has already done before does not payoff. For this, CVE should be a time saver when looking for information.

2. *Enrich Value Engineering Body of Knowledge:* Everybody has his (her) own bits of unique experiences and points of view about VE theory. This is also true for the achieved performance in the application of the Value Methodology. By means of this platform we wish to add up all of these bits into the great VE Body of Knowledge.

3. *Promotion of VE world wide and to the Academia:* A body of knowledge that is being revised and updated in real time by actual VE practitioners will be a trusted up-to-date source of information for the academia that includes VE in their curricula, or just want to research about it.

4. *Real time networking*: Even though journals and conferences can really do a good job in sharing information and experiences among VE Practitioners, there is always some sort of limitation due to the frequency and strict agenda of a conference. In the case of journals there is also a time limitation because its frequency as well as space limitation (limited amount of articles included per volume). CVE is intended for VEP to upload any information onto the platform at anytime, even if it is only a word. CVE also has an

instant messaging tool for its users, giving more value to the meaning of "real time networking"

5. *Improve VE team performance.* CVE should be a must-visit site for any VE team looking for tips or information regarding the applications and experiences of the Value Methodology. The information of the body of knowledge, other VEP expertise, open discussion groups as well as the instant messaging tool will help teams find solutions for improving their performance during the job plan.

Since VEP's are geographically spread and will remain that way, this platform is developed on the Web 2.0 so there is a virtual place where VEP may collaborate among each other regardless of location, time zone or agenda. The use of Web 2.0 tools allows the users to collaborate even if the agenda of stakeholders makes it difficult to meet, since information for collaboration is posted online in different independent moments.

CVE is mostly constructed with a combination of web pages and wikis. Web sites contain information about CVE and wikis are the platform for collaboratively constructing the VE body of knowledge. There is a set of supporting tools like email, blogs, instant messaging tools, online spreadsheets, documents or presentations, online calendars and more; supporting communication, organization and collaboration among CVE members, all this under the same domain www.collaborativeve.org.

For CVE to be a reliable and attractive source of information on Value Engineering, it was created with *protected security level*, meaning that anybody in the world will be able to read from it, but editing will be restricted only to SAVE international active members *that apply* to edit this site. This level of security happens to be a way to promote VE –by letting anyone read posted information-, as well as assuring trustworthiness of the material contained –by limiting editor rights to SAVE members. This is because we may assume that anyone that is a current member of SAVE international shares a standard minimum knowledge and care about the Value Methodology that will fulfill the first and second prepositions presented by Dondio and Barret on article trustworthiness. Besides, since the application to participate as an editor in the site is completely volunteered, we may presume that the probabilities of having inexperienced and unenthusiastic editors will be minimized. And even in the case that this situation happened, *the broken windows crime theory* will apply and the experienced VEP editors will have the ability to correct this on the site.

In the case of any type of misuse, there is the chance to report it –assuring Dondio and Barret's third preposition- by creating a clear channel to make the report of the event to the site manager. If there is a communication that generates a conflict among the group or a clear misuse of the Value Methodology is uploaded, it will be possible to report the situation to the site manager, get the wiki to an older version –previous to the misuse- or even to cancel participation rights to the editor that caused the problem.

Figure 1 shows the basic FAST diagram summarizing the main functions performed by CVE in order to achieve the enrichment of Value Engineering's Body of Knowledge. The high order function is the enrichment of Value Engineering's Body of Knowledge, and this will be achieved by setting up a platform that eases collaboration. The nature of Wikis, allowing several users to edit the information on the Web will certainly do the task. Besides, because the information is displayed on the web so anybody can see it, it will also work as a promotion tool for the up-to-date Value Methodology practice.

Quality of the content is assured by sharing editing rights with those actually performing VE activities or that own some recognized knowledge about it.

Fig. 1. Collaborative Value Engineering FAST Model
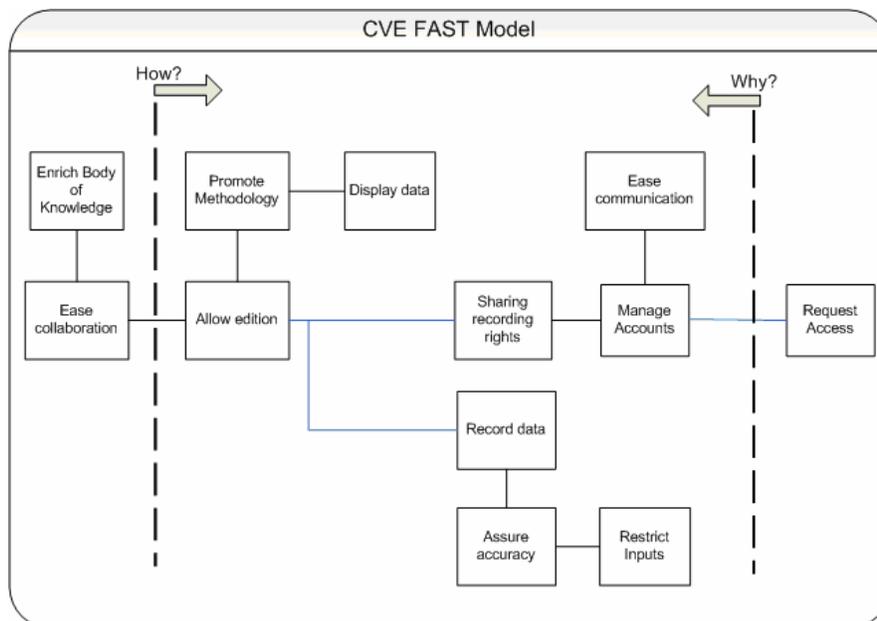
Conclusion

The formation of non-geographical clusters is basic to boost the development of the body of knowledge from experts on any field. The global nature of knowledge and difficulty for globally scattered experts to collaborate demand new interaction platforms to ease this effective collaboration. Web 2.0 presents a set of solutions easy to understand by people with no experience or knowledge on HTML or web edition software. By creating an easy to use Web 2.0 platform specially dedicated to Value Engineering, it is expected that the collaboration among expert authors will enrich its Body of Knowledge as well as strengthening the promotion and improvement of the Value Methodology.

The original abstract I wrote when the idea for this proposal came to my mind included some specific subjects to be included as part of CVE contents. But while doing my documental research I found a comment made by Adrianna Kezar when she wrote about collaboration and its process among collaborators: "In order to be considered collaboration, it is key that the process entail an interactive process (relationship over time) and that groups develop shared rules, norms and structures, *which often become their first work together*". (Kezar, 2005). I have to totally coincide with her on the idea that the rules and goals over the time for CVE are not to be presented by this author, but collaboratively defined by those who wish to be part of this group.

It is my believe that after reading this paper, collaborative work and Web 2.0 are better understood by the VEP reader, as well as s/he feels more comfortable and enthusiastic about wikis. Much better, enthusiastic about VE's specialized wiki: Collaborative Value Engineering.

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