

PITTBUSINESS

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Independent Research Study

Applying Web 2.0 Technologies in Today's Business Organization

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1.0 EXECUTIVE SUMMARY

Web 2.0 technologies are continuing to evolve and are becoming effective tools in business organizations.

According to Tim O'Reilly, the founder and chief executive of O'Reilly Media, the computer book publisher, and an evangelist for open source technologies, creativity is no longer about which companies have the most visionary executives, but who has the most compelling "architecture of participation."¹⁹

This research paper discusses the following topics:

- Mass collaboration and the key concepts that are vital to its success.
- Current Web 2.0 technologies that are being used by organizations, along with some success stories.

Web 2.0 is more than just a new technology, it is about organizations changing their business models to be more competitive via collaboration and sharing. In the past the web and intranets in organizations have been used to share information in a read only format. Web 2.0 is all about participation and providing users the ability to collaborate.

This paper recommends five areas for improving Concurrent Technologies Corporation's (CTC) existing systems by utilizing Web 2.0 technology. They are as follows:

1. Implementing an internal corporate wiki to serve as a corporate encyclopedia.
2. Promoting internal blogging to share information and reduce mass corporate emails.
3. Implementing CTC Pages, an internal social network that allows individual employees to have internal MySpace like pages.
4. Implementing the CTC Innovation Market as an idea generation tool.
5. Implementing a real-time incentive based solution solving system.

Often times change is a result of some disruptive technology. The tools researched in this article represent disruptive technologies that have the ability to promote change in an organization and disrupt the status quo.

2.0 INTRODUCTION

In today's business environment, technology is changing at a rapid pace. While this can be attributed to a number of factors, one large contributor is the ability for individuals to collaborate and work together to solve common problems. The Internet is evolving at a rapid pace and what was originally thought as a content sharing system is becoming more and more useful as a collaborate framework. The term "Web 2.0" has been used as a buzzword recently and this research paper will take a deeper look at this new buzz in the industry.

2.1 Purpose

The main purpose of this paper is to provide an overview of Web 2.0. This includes defining what Web 2.0 is and the technologies that are associated to it. This paper will also discuss why these tools are useful. Lastly, the paper will identify some of the more common tools that are being utilized by organizations.

Upon reading this paper you will have a more detailed understanding of what Web 2.0 is, what tools are currently being used and what organizations are using them.

The paper will also address specific areas where these tools could be leveraged internally at organizations as a way to promote continuous improvement.

2.2 Scope

This paper will attempt to identify all of the known categories of Web 2.0 technologies; however it will not attempt to clearly define all of them in great detail. Instead this paper will provide a detailed description for those technologies that are more highly used and provide great potential to be affective internally to an organization.

Many Web 2.0 technologies have great relevance for the internet community at large, but this paper will focus on those technologies that provide benefits when used internally in an organization.

3.0 MASS COLLABORATION

The success and general exponential growth of recent capabilities can be attributed largely to mass collaboration. Simply put mass collaboration can be defined as a collective action when a large group of individuals work together on a single project³. The open source community is a great example of mass collaboration. However, one might ask why? Why are these projects successful? Why do individuals spend so much time with little to no financial reward?

Demographically the workforce is changing. Many of the new workers entering the workforce have grown up collaborating and utilizing shared spaces, such as MySpace. These individuals are often referred to as the Next Geners and will bring many new perspectives to the traditional workplace environment.

This section will identify some of the key characteristics that have been associated with successful collaborative projects.

3.1 Four Key Principles

To truly understand mass collaboration and why it works, we must first look at some key principles to its success. The book *Wikinomics* (Reference: 1) identifies four key principles utilized by successful collaborative projects. That is being **open** (open source technologies as an example), **peering** (collaboration example of Linux), **sharing** (opening up intellectual property, example Java), and **acting globally** (taking advantage of resources outside an organizations walls).

3.1.1 Openness

The concept of being open has evolved from the Open Source community. Openness in this context is being transparent and going outside the corporate knowledge pool to solve problems. Open source technology solutions have significantly evolved over the last five years. This can be contributed to evolution of technology, but more importantly it has shown a true model for collaboration. The Open Source community is growing and is very strong. This begs the question, why are so many developers willing to devote countless hours to an open source development projects.

There are a number of reason why developers devote the time they do, but lets discuss a few in a little more detail. First, many developers just have a passion for what they do. These individuals are very excited and passionate about a given technology or concept. The time they spend is considered enjoyable versus being traditional work. These individuals seek out the opportunity to get involved in projects that they enjoy.

Secondly, some individuals are seeking recognition for there work. In today's competitive market, the open source community provides a playground for individuals to shine and show off their skills. This is a great opportunity for these individuals to open new doors for job opportunities. So for these individuals, there is some incentive.

Lastly, individuals participate to enhance existing solutions to meet their current needs. The open source promotes giving back. Utilizing these solutions often times gives a project a jump start, but may not meet their needs entirely. These individuals give back to enhance the current solutions and stimulate more ideas and feedback for improvement.

The open source community also provides sharing and collaborating. They have individuals from many backgrounds and areas that work on their projects. The open source community truly promotes continuous improvement and enhancements. Probably one of the most well known success stories is the Linux operating system.

3.1.2 Peering

Peering in this context is a form of horizontal organization that increases an organizations ability to create information-based products or services. Traditionally, most organizations have a rigid

hierarchy for information dissemination. The peering concept is simple, all of us together are stronger than best of us alone. Organizations typically focus on the individual and there is a strong shift toward focusing more and more on peering. There is a difference between peering and what you may be thinking of as a team. Teams often times are comprised of diverse groups of individuals from an organization, but in most cases have been appointed. Peering works well because these are self-organized teams.

When Linus Torvalds created Linux, he shared his new creation with other programmers via online messaging boards. The response was not hand picked; rather he obtained feedback from a number of passionate programmers that believed in his goal of developing a new UNIX based operating system. Think of the what a powerful operating system Linux has become, and it all started with a simple online messaging board in the early nineties.

Another great example of peering demonstrates a true change in traditional mindset. In the investment community, portfolio managers are highly regarded individuals. The key here is this community has been built around individuals. Marketocracy was an organization that was started in 2000 to challenge this traditional mindset for the better of all involved. They created a head to head competition for managing mutual funds, virtually of course. Any users can log on and they are allotted \$1 million virtual dollars to manage a portfolio. While this is not an idealistic peer to peer network, it demonstrates how other industries are thinking outside the box where conventional wisdom favors individual stock advisors.

Today, technology is growing rapidly and our ability to collaborate with others is become easier and more efficient. The peering concept requires two key principles for success: technology tools to facility collaboration and individuals with a passion for change. Peering succeeds because it leverages self-organization, which given certain tasks can be more effective than hierarchical management. Peering is most noted for its production of information goods, such as software and media. But why stop there? Many of the decisions made by an organization could leverage the interests and ideas of others throughout the firm.

3.1.3 Sharing

Organizational giants have arisen from key intellectual copyrights and patents. IBM is one of those firms whose business was built around intellectual property. In fact IBM holds more patents than any other US based Technology Company⁴. However, IBM is also a major player in the open source community and has completely revamped their business model to condone sharing versus prevent it.

IBM now invests a significant amount of money into the open source community. For example, IBM invests approximately \$100 million per year on general Linux development. If the Linux community puts forth roughly \$1 billion of development effort, half of which can be leveraged by IBM and its customers, then IBM is getting \$500 million worth of development for a \$100 million investment. IBM sees the ability to build products faster by utilizing the large open source communities' talent pool. They are a significant contributor to the Eclipse IDE, which is arguably the most widely used development platform.

So why would IBM and so many others start to change their model? Well many organizations are seeing that fighting intellectual property battles are often crippling to their ability to create value. The wikinomics book put it best by saying, “smart firms are treating intellectual property like a mutual fund – they manage a balanced portfolio of IP assets, some protected and some shared”. So sharing does not mean opening up your doors and letting the world sift through years of work, rather it is about strategically thinking differently. Organizations need to recognize where they can significantly benefit by pulling in the ideas of the community, versus what is truly a competitive advantage.

One of the more recent organizations to take on this mind set was Sun Microsystems. Sun has recently open sourced the majority of its java based development kits. Jonathan Schwartz announced this idea at the 2006 JavaOne conference, and said that we are now entering a collaboration era. Sun realizes that the Java community is strong and has many great ideas. They want to give the consumers the ability to give back, participate and lead in the evolution of Java based technology suites.

3.1.4 Acting Globally

Last, but certainly not least is the concept of acting globally. The evolution of technology and communication mechanisms has truly facilitated organizations in their ability to act more globally. Many organizations are international companies that have teams dispersed around the world. Technology allows these individuals to work as if they were working locally. These changes are allowing organizations to leverage larger global talent pools.

The key word here is “acting” globally. Many organization think globally in terms of there strategic direction, but do they truly act globally? Ralph Szygenda, CIO of General Motors says it best, “Most big companies are multinationals, not global, and increasingly that is a big problem for all of us”. This is truly a major challenge for GM. GM was built up from many major brands and each of which had their own set of procedures and ways of doing business. These silos prevented significant challenge for GM to act globally, as each brand supported its own human resources to manufacturing departments.

While technology and bandwidths were problematic for organizations to truly act globally, these issues are quickly become a distant memory. Many organizations have the ability today to communicate with employees all around the world via technology as simple as instant messaging. While technology continues to evolve and bandwidth becomes increasingly faster, organizations are finding that remote communications feel more and more like local communications.

3.2 Putting it all together

As we discussed above, collaboration happens through organizations being open, sharing information, peering and acting globally. The following is an example of successfully pulling all of these concepts together.

One of the most fascinating displays of collaboration has to be Wikipedia. Wikipedia utilizes the Wiki software platform to bring people around the world together to collaborate and create a true open encyclopedia. Wikipedia, like many open source technologies can be considered a disruptive technology. It has truly changed the way we share and collect information. Any individual can start producing and editing Wikipedia pages.

Disruptive technology is defined as a technological innovation, product, or service that eventually overturns the existing dominant technology or status quo product in the market¹⁷. Wikipedia evolved because there was a need to obtain and share information quickly. Wikis are becoming more and more popular among organizations as a way to collaborate and disseminate information throughout the company. When people share in the creations of content, they take a sense of ownership.

While Wikipedia is largely successful, there have been some definite growing pains. For example, when you have a completely open framework to share information, you also run the risk of sharing bad information. Wikipedia has felt this pain and is working through how to manage that. A small amount of pages, such as the Presidents page, have been locked and are only accessible by a limited number of users. Some pages are protected pages, such as the Wikipedia homepage, and require user to be members and carry certain privileges to edit. Wikipedia has done this to reduce the amount of vandalism to the home page. While this vulnerability exists, one of the key advantages exposed is that this information can quickly be corrected.

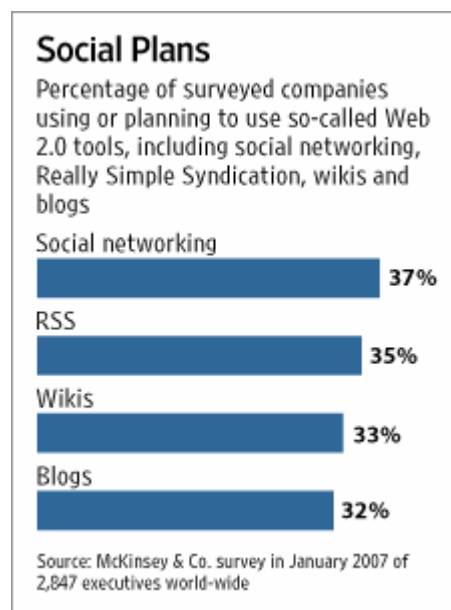
This model fits well for organizational information. Take for example the corporate world of acronyms. Often times you need a list of acronyms just to stay in tune during a meeting on a new project. While organizations attempt to keep acronym lists and such, it is a very daunting task and requires a lot of work to collect and disseminate this information. That is if you don't have a Wiki. Wikis provide an excellent tool for maintaining and obtaining acronyms. They empower the employees to contribute information and take ownership in the information.

4.0 COLLABORATIVE TOOLS

Web 2.0 is the term used to refer to the next generation of the web. While the web has not technically changed, the tools that utilize the web have evolved significantly. This section will identify and define a number of the most popular tools used today.

To this point we have discussed a lot of the theories and concepts behind collaboration, but have not called out the specific tools that facilitate this. Web 2.0 and its associated technologies are starting to play a key role in many organizations. IBM is one of the largest organizations that has jumped into the Web 2.0 craze full force.

The Wall Street Journal has hosted a number of Web 2.0 related articles. One of which asked a number of executive if they use or plan to use Web 2.0 tools in their organization. The results were as follows:



Source: Wall Street Journal 6/18/2007 ⁶

The four tools selected above are the most widely used by organizations. The following sections provide descriptions of the technologies identified above; how they are currently being used; by who and where you can find some of the latest topics.

4.1 Wikis

A wiki is a web application designed to allow multiple authors to add, remove, and edit content⁷. Organizations are quickly adopting this new way of creating and collaborating on corporate topics. IBM is leading the way with its wide spread application of Web 2.0 technologies. IBM's Wiki Central was started to manage the internal company wikis. As of early this year, IBM now has more than 20,000 wikis with more than 100,000 users. This is a pretty impressive number for an organization.

Wikis at IBM have been used to document many different corporate topics. Most recently IBM has been using wikis to provide information regarding projects. The Wikis provide a simple way for managers to obtain a status for the various projects across the organization, versus contacting each project lead individually. IBM also utilizes plug-ins for their wikis called widgets. Widgets are plug-ins that provide additional functionality for a wiki. IBM uses a polling widget which allows team members to vote on issues, such as the length of a field in a database or the size of a data file used in a program. They also use a rating widget that allows team members to rate various proposals⁸.

IBM is one of a list of organizations that are utilizing wikis. The use of wikis range from managing projects to capturing key organizational knowledge. Wikis are well suited and have many applications for business problems. Walt Disney Co.'s Pixar studio is using wikis to coordinate the animations tools for an upcoming film.⁶ Intel Corporation is another larger organization that is utilizing wikis in the workplace. The Intel Wiki has been edited 100,000 times and viewed more than 27 millions times!

While many of the organizations are using wiki to share and collect information internally, SAP has opened its wiki up to customers and software developers that interact with SAP software. SAP has used its wiki to replace an older forum system where users would post and ask the same questions over and over. With the wiki, employees, developers and customers are working together to provide information that is becoming an invaluable resource for the organization.

There's a popular concept in the online world called the 1% Rule: That is, on a site that relies on content from its users, only 1% of those users actually contribute the content, while the other 99% passively consume it⁹. What this means for an organizations is that you need a few leaders to kick this off. Most of the users will consume the information, which is a great way to communicate and educate your employees.

There are a number of wiki software solutions out there, but this research paper will focus on a few of the most widely used.

- **MediaWiki** - <http://www.mediawiki.org/wiki/MediaWiki>
Media Wiki is the open source solution that Wikipedia.org is built around. This is arguably the most widely used wiki system. It is easy to setup and is configurable. The overall look and feel of the wiki emulates that of wikipedia.org, so it represents a friendly interface for those familiar with Wikipedia. As of June of 2007, MediaWiki has been downloaded 1,268,898 times¹⁰.
- **Social Text** - <http://www.socialtext.com/>
A Socialtext wiki is a secure, group-editable website. Instead of sending emails and attachments, Socialtext customers use private web pages to work together.
- **Confluence Wiki** - <http://www.atlassian.com/software/confluence/>
The confluence wiki is the self proclaimed largest commercial wiki with 3200 organizations around the world. The confluence wiki software is feature rich, but this comes at a price. An enterprise license with unlimited users costs \$8000.00.

While wikis have many positive attributes, it is important to understand the limitations and risks. Wikis provide any individual with the ability to post and modify information. Most critics of Wikipedia argue that there is not guarantee that the information is correct. This concept holds true to organizational wikis. Organizations have attempted to limit the risk of an open communication tool by developing usage policies that all users must accept. In true collaborative fashion they used the wiki to have the users contribute to define the usage policy. Wikis are document focused and bring less attention to the individuals contributing on the Wiki.

4.2 Blogs

Blogs (or weblogs) are website entries that are written in chronological order¹¹. Blogs really took off across the web as users provided their particular insight on various topics. Blogs have been used internally in organizations to communicate information. A number of industry leading organizations such as Sun Microsystems, Procter & Gamble Co., Northwestern Mutual Life Insurance Co., TBWA Worldwide, and IBM are currently utilizing blogs to disseminate information and provide employees the ability to voice their opinions. While blogs are traditionally tied to an individual, they can also be used to disseminate information from groups such as Human Resources or an organizations Quality group.

Blogs provide a way for employees and managers to discuss important industry trends. They have been used as a way to bring new employees or new project team members up to speed, as they provide a history of how a project or activity has evolved. Blogging has been used as a way for employees to vent about recent changes in an organization.

Some critics of using blogs internally state that there is potential for employees to leak information or blog on offensive information. The organizations mentioned above have not had any problems with this. IBM empowered their employees to help develop the policies for their blogging systems. One key is that there are no anonymous users to these systems. All users must be registered and acknowledge the rules and policies for blogging.

One of the key differences that a blog brings to the table versus a wiki is that blogs promote individuality. Individuals are clearly the front and center of the information being discussed or provided. This gives an employee an opportunity to branch out and share interests or thoughts that may be outside the scope of their current position. This also provides a great opportunity to share knowledge or tips and tricks found on the job.

Another great feature of blogs are the ability to comment on an article. This provides consumers of the blog the ability to leave comments, both positive and constructive criticism. Blogs can also be archived, so they can stay around for awhile. Most blogs also support RSS, which provides away for consumers to be notified when a blog has been updated.

RSS



RSS (Really Simple Syndication) is a format used to publish frequently updated content, such as blogs. An RSS document (often called a feed) will contain either a summary of content from an associated web site or the full text.

RSS content is read using a feed reader. Users will subscribe to feed, via a link or entering the feed's link. The reader then checks the feed regularly for new content and will download any updates it finds (Reference: 23).

There are a number of blogging software solutions out there, but this research paper will focus on a few of the most widely used.

- **WordPress:** <http://wordpress.org/>
WordPress is a powerful personal publishing platform, and it comes with a great set of features designed to make your experience as a publisher on the Internet as easy, pleasant and appealing as possible.
- **Apache Roller:** <http://roller.apache.org/>
Roller is a Java web application that will run on any Java EE server utilizing any relational database. Roller is best supported on Tomcat and MySQL.

Blogs are a great way to share information and are particularly good for recognizing the individual contributors. One weakness to blogs is that if they are not updated frequently, and they often are forgotten. RSS feeds help with this problem, as blogs that may not be updated frequently have the ability to reach interested users via an automated feed.

4.3 Social Networks

Social networking internally in an organization is growing more and more. IBM as mentioned before is utilizing various Web 2.0 technologies, one of which is Social Networking. In fact, IBM owns 50 islands in SecondLife. IBM has been using SecondLife to hold meetings and facilitate group discussions. This gives users from disparate locations the ability to have a virtual presence in a meeting. Users have the ability to create Avatars that can be used to provide some visual reflection of them.

Other organizations have been adopting a more traditional social network like one from LinkedIn Corp. LinkedIn is increasingly being adopted by organizations as a way to recruit staff and make sales contacts. LinkedIn provides a network of individuals who are Linked together to form larger networks. LinkedIn makes me think of the six degrees of separation rule, in that you may be closely linked to a position or new hire through current contacts.

The GeekSquad, which is the computer services giant that is now owned by BestBuy, used a non-traditional form of social networking. One of the keys to the success of the GeekSquad was the quality of services, which in a large part came from the knowledge of the individual agents as they are called. The GeekSquad followed a first observe then implement strategy. They utilized their agent's knowledge for new ideas because they were in the field interacting with customers. Involving the agents helped to breakdown traditional hierarchies to build a more collaborative atmosphere.

SecondLife

www.secondlife.com/



SecondLife (SL) is a th dimensional virtual world. Second Life is a 3-D virtual world entirely built and owned by its residents.

Since opening to the public in 2003, it has grown explosively and today is inhabited by a total of 7,521,484 people from around the globe.

SecondLife is being used by organizations to host meeting, hold presentations and market new products and services.

While many of the GeekSquad agents were interacting with each other, there was some concern about the agents in Alaska. In an office conversation, the Robert Stephens asked how things were going in the field and specifically how the agents from Anchorage Alaska were doing in keeping up with the GeekSquad mission. The deputy directory of counterintelligence assured him they are ok, because he interacts with them regularly. Stephens asked how and found out that a majority of his agents play the online game Battlefield 2. Curious, Stephens joined in from time to time and what he found was that in between the taunting and fun, his agents were actually talking shop about various topics such as revenues to the latest issues to arise. What Stephens learned was that while he was trying to build the perfect collaboration platform, the agents already had it and were utilizing it! The key concept from this story is that instead of setting the agenda, sometimes you have to step back and discover the agenda that is already there and serve it.

Internal social networks (such as a corporate MySpace), which may be used to locate specialists on certain topics has been slower to take off in the industry. IBM does however utilize an internal MySpace called BluePages. IBM links all content that an employee contributes to their personal BluePage. The BluePage allow individual to upload photos of them, not limited to the employees badge picture. Employees have often put pictures of themselves with their family, animals or enjoying a hobby. While the BluePages contain the usual Human Resources information, such as Name, Title, Location, Email, etc. They also allow the individual employee to post additional information, such as highlights from resumes, current interest areas, individual awards, etc. The BluePage become an employee's opportunity to market his or herself to other.

Social networks continue to grow at an alarming rate. The following list highlights a number of the most popular social networking sites.

- **LinkedIn: www.linkedin.com**
LinkedIn is an industry network that allows users to connect with current and past colleagues, search or post job offering, and also collaborate with industry experts on topics of interest. LinkedIn currently has approximately 11 million users from 150 different industries.
- **MeetUp: <http://www.meetup.com/>**
Meetup.com helps people find others who share their interest or cause, and form lasting, influential, local community groups that regularly meet face-to-face. Meetup range from knitting, book clubs and political party meetups.

The following is a list of the most frequently used Social Networking software platforms.

- **Sparta: <http://www.spartasocialnetworks.com/index.php>**
Sparta Social Networks is the leading provider of Social Network Software to major consumer brands, websites, groups, clubs, organizations and universities. Our products are used widely by companies like Swirve, AskMen, SteakandCheese, FreeTimes and more, and have been featured on CNN and TechTV.
- **IntroNetworks: <http://www.intronetworks.com/>**
IntroNetworks Inc. provides hosted and customized solutions for corporations, organizations, event planners, trade associations, and publishers. Create an innovative

online community for a product launch, a user group, an annual sales meeting, a global all-hands, or a special event to bring together customers and employees. The possibilities are limitless!

- **ELGG:** <http://elgg.org/index.php>

Elgg is an open source social platform based around choice, flexibility and openness: a system that firmly places individuals at the centre of their activities.

Your users have the freedom to incorporate all their favorite tools within one environment and showcase their content with as many or as few people as they choose, all within a social networking site that you control.

4.4 Social Bookmarking

Social Bookmarking is a new way to organize and browse the internet. While traditional bookmarking stores a webpage so it may be recalled from a single machine, social bookmarking allows users to store and share bookmarks with other from a central location.

IBM again seems to be leading the way for incorporating social bookmarking into the enterprise. IBM developed the Dogear project to develop a social bookmarking solution for their enterprise. This system allows users to bookmark intranet pages in a central repository. One goal of the project was to allow users to search for experts in certain topic areas within the organization. An example would be finding an expert in Java. The users can search the dogear java tag to see who in the organization has been bookmarking pages on Java. When the user finds an expert they can see all of their bookmarks. In addition this project also links the user to the experts contact information and personal blog. This project helps to promote collaboration among the many resources in the organization.¹²

Some users of the Dogear system were apprehensive about sharing all of their bookmarks. Users stated that some of their bookmarks were personal. Instead of forcing users to maintain two sets of bookmarks, the dogear system allows for private tagging of bookmarks.¹³

The Dogear system has been very successful and popular at IBM. The RSS capabilities allow users to stay up to date with newly added bookmarks. This has been a great resource for communicating the latest and greatest technologies across the organization. Dogear also augments the traditional searching mechanism. Users may have trouble finding exactly what they are looking for via the internal search engines, but using Dogear as another alternative, were able to find direct links to what they were looking for.

- **BibSonomy:** <http://www.bibsonomy.org/>

BibSonomy is a Web-based social resource sharing system that allows users to organize and share bookmarks and publications collaboratively.

4.4.1 Collective Tagging/Folksonomy

Folksonomy is the name for many of the informal social categories evolving today on the web¹⁴. A folksonomy can be thought of as a dynamic ontology. Users create tags to associate various

information, such as photographs. Flickr is one site that leverages collective tagging where users define the tags to associate to their picture.

One of the pros involved with Folksonomy is that they allow individuals the freedom to tag information as they see it, leaving out the complexities of learning a rigid ontology format. Individual users can also search and view various tags of other users who may view information they see in a similar way¹⁵. Tagging in this way allows individuals to share their own personal information architecture socially.

Some of the criticisms of folksonomy are that they lack synonymous searching, there is some ambiguity in one word tags that may have multiple meanings, and they do not have a hierarchy associated to them.

4.5 Predictive Markets

Predictive Markets are speculative markets created for making predictions.¹⁶ While prediction markets have been around for sometime, they are becoming more and more applicable in the workplace. A well known predictive market is the Iowa Electronic Market, which is used to predict presidential elections. Since 1988, it has predicted the results of American presidential elections more accurately than traditional polls 75 percent of the time.

So can predictive markets be applicable to the enterprise. Starwoods hotels thinks so. They used predictive markets to develop new marketing campaigns. Their marketing department generated some of the new ideas and released them to their employees. Employees were then able to participate by making changes or adding new ideas. They then used incentive based prediction markets to select the best marketing campaign. Starwoods used a prediction market place provided by InnovateUs.¹⁷

Google is another organization that is taking to predictive markets. Google released on The Official Google Blog¹⁸, that they have been using predictive markets for strategic decisions within Google. Their predictive market is focused around personal recognition and points when the employees are correct. More traditional predictive markets offer financial awards.

Rite Solutions is a software company that build command and control systems for the Navy.¹⁹ At Rite Solutions, they have developed an internal market for proposal. They focused the market around fun and each employee gets \$10,000 in what they call “opinion money”. When an employee has a new proposal idea, they list it on the internal market, named Mutual Fun. The stock starts at a price of \$10. Executives can get a feel for what the employees think will be the next hottest item based on the investment in the stock and, better yet, employees volunteering to work on the project. Volunteers are rewarded with real money if the stock becomes a product or delivers earnings for Rite Solutions.

While the above organizations are utilizing predictive markets internally, there is also a great opportunity to leverage outside involvement as well. InnoCentive is a website that has literally become an idea marketplace. Procter & Gamble, Boeing and DuPont are among the many

organizations that are currently utilizing InnoCentive to help solve some of the difficult technical challenges they are facing in their research labs. The site is made up of two types of users: seekers and solvers. Seekers represent organizations that have problems that they need ideas for. They will post challenges that contain a detailed description, deadline and award value. Award values range anywhere from a few thousand dollars to upward of 100,000 dollars. Solvers can then view a listing of challenges to participate in. The solvers can then submit ideas for a given challenge.

These systems give organizations a way to connect the organization in a new and fun way. Executives are realizing that organizations have hidden talent pools that need to be unleashed. Predictive markets are a fun and exciting way to engage your employees in the company and products or services it provides. A few of the leading software providers are listed here:

- **Consensus Point Inc.:** <http://www.consensuspoint.com/products.php>
Consensus Point offers prediction market software that can be hosted internally by an organizations or hosted by Consensus Point.
- **Zocalo:** <http://sourceforge.net/projects/zocalo/>
Zocalo is a toolkit for building Prediction Markets, markets in securities that pay out depending on outcomes of future events. They provide estimates of the likelihood of specific outcomes that are more reliable than other sources of predictions.

4.6 Human Computation

Human Computation is a process used by computational processes to retrieve human interaction for common sense data. Currently computers cannot process information like the human mind. An example is making common sense associations. Currently most pictures are searched via the image name and/or its textual description. This often times leads to image search results that are not exactly what a user is looking for. A recent example would be to search for the word “dog”. The first page of a Google image search has a few images that do not make sense, such as a frog and a man in a tuxedo. This is because either the name or the description contained the word dog.

Luis Von Ahn's who is a professor in the Computer Science Department at Carnegie Mellon University is doing a lot of research and work in this field. A recent presentation he gave on Human Consumption brought up some interesting concepts²⁰. He and his team have developed a few games to help make capturing information related to images more fun and exciting. Luis found that humans spend 9 billions hours a year playing solitaire.

There is a significant amount of time spent by humans playing simple games that they enjoy. Here is where The ESP Game has brought an interesting new model to the net. They developed a simple game where you are randomly paired with another online user. An image is displayed and each user must try to match the word or phrase the other user is using to describe the image. When the two match, each player gets points and they move onto another picture. This is allowing Luis and his team to collect information that is better suited for tagging the photo.

While Human Computation is not a mainstream effort in most organizations, its capabilities are something to be considered. If an organization has daunting tasks that require human interaction for definition, the use of gaming systems could help in the collection of this data.



The ESP Game
As seen on CNN and
newspapers around the world!
beta

The ESP Game is an experiment in human computation originally conceived by Luis von Ahn of Carnegie Mellon University. The idea behind the game is to use the computational power of humans to perform a task that computers cannot yet do (in this case, labeling images) by packaging the task as a game. (Reference: 22)

5.0 CONCLUSION

The goal of this paper was to communicate the Web 2.0 tools available, specifically those being utilized by other organizations. These solutions do not require an all or nothing approach to implementation. Quite often the right approach is to start small and pilot the tools with a small group of individuals. Let the tools sell themselves as most users will share the information with their colleagues.

The use of the Web 2.0 technologies described in the previous section is continuing to grow. Industry leaders have adopted these tools because of the changing dynamics of the workforce. Many of the new hires entering the workforce today have grown up in a world of collaboration and are familiar with using these tools.

Organizations have a great deal of knowledge internally, but often times this information is not shared or accessible for consumption by the employees of the organization. A surveyed conducted by Forrester Research Inc. in 2005 showed that only 44% of the 2,000 business users surveyed said they could easily find what they were looking for on their intranets²¹. A survey of 1,000 middle managers of large corporations in the United States and United Kingdom was performed by Accenture Ltd. in January of this year. That surveyed revealed that 59% of respondents stated they miss information that may be valuable to their jobs almost everyday because it exists somewhere else in the organization or they just cannot find it.

For any of the topics to be successful, there are a few guidelines that should be addressed. In general, the broad success of these products requires support from management. Employees should be encouraged to participate. It is also very important to select the right tools to meet your goal. For example, blogs and wikis are often viewed as interchangeable solutions. These tools are similar, but do have some significant differences. Blogs work best for time-sensitive information and when the information should be tied to a single author. Consider an update on an individual's role in a project. While wikis work best for information that will be frequently updated and where the information is more important than knowing who contributed it.

Being open is a giant leap for many organizations. When making the transition to a more collaborative and open environment for information exchange, remember to trust your employees but to also have policies in place. Northwestern Mutual has been around for 150 years and may seem to be an unlikely advocate of open blogging. However, it has provided open blogging to employees with minimal restrictions. When an employee registers with the system, he or she simply has to agree to the company's policies and guidelines for blogging.

The industry as a whole seems to agree that it is imperative to have clearly expressed policies and procedures for open information exchange within an organization. You want people to understand that they should not write anything that they wouldn't be willing to share with the entire organization.

The participation age is among us. Web 2.0 offers new avenues for business success that were not present years ago.

6.0 REFERENCES

This research paper relied heavily on current industry trends and publications. The following resources were used in the writing of this paper.

6.1 Books:

1. Tapscott, Don and Williams, Anthony D. Wikinomics: How Mass Collaboration Changes Everything.

6.2 Websites:

2. <http://www.educause.edu/ir/library/pdf/ELI7001.pdf>
3. http://en.wikipedia.org/wiki/Mass_collaboration
4. <http://en.wikipedia.org/wiki/IBM>
5. http://en.wikipedia.org/wiki/Disruptive_technology
6. <http://online.wsj.com/article/SB118194454386837188-search.html?KEYWORDS=wiki&COLLECTION=wsjie/6month>
7. <http://en.wikipedia.org/wiki/Wiki>
8. <http://online.wsj.com/article/SB118194536298737221-search.html?KEYWORDS=wiki&COLLECTION=wsjie/6month>
9. <http://online.wsj.com/article/SB118194629405937232-search.html?KEYWORDS=wiki&COLLECTION=wsjie/6month>
10. http://sourceforge.net/project/showfiles.php?group_id=34373
11. <http://en.wikipedia.org/wiki/Blogs>
12. <http://domino.watson.ibm.com/cambridge/research.nsf/242252765710c19485256979004d289c/1c181ee5fbcf59fb852570fc0052ad75>
13. <http://acmqueue.com/modules.php?name=Content&pa=showpage&pid=344&page=1>
14. <http://en.wikipedia.org/wiki/Folksonomy>
15. http://atomiq.org/archives/2004/08/folksonomy_social_classification.html
16. http://en.wikipedia.org/wiki/Prediction_market
17. <http://www.innovateus.net/>
18. <http://googleblog.blogspot.com/2005/09/putting-crowd-wisdom-to-work.html>
19. <http://www.nytimes.com/2006/03/26/business/yourmoney/26mgmt.html?ei=5090&en=0d90ed5116e769d0&ex=1301029200>
20. <http://video.google.com/videoplay?docid=-8246463980976635143>
21. <http://online.wsj.com/article/SB117873739494197490-search.html?KEYWORDS=collaborative+tools&COLLECTION=wsjie/6month>
22. http://en.wikipedia.org/wiki/ESP_Game
23. <http://en.wikipedia.org/wiki/RSS>