

Enterprise 2.0 Integrated Communication and Collaboration Platform

A Conceptual Viewpoint

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Abstract—The intensification of collaborative networking in the enterprises, wide adoption of mobile applications and other progressive IT technologies by businesses, influence enterprise development. Thus, we focus in this paper onto the evaluating the role and place of communication&collaborative platforms in new generation of enterprise management paradigm dependent onto the social collaboration tools. Explicitly, we consider here integration challenges of main collaboration strategies. Besides, we analyze the role of different advanced IT technologies in the enterprise social collaboration platform. Next, we define impact factors of social networking onto corporate world including placement of a social collaboration layer in new enterprise architecture. And finally, we conclude with presentation of our findings along with further research strategies discussion.

Keywords- *Communication&Collaboration Platform, Enterprise 2.0, Service Oriented Architecture (SOA), Social Networking, Web 2.0.*

I. INTRODUCTION

Contemporary competitive market-spheres have made business vital for individuals to access, create, share, refine, and distribute content rapidly on a worldwide scale in continuous performance improvement cycle. Different Internet-based applications and even portals can be composed quickly from the reusable services and promptly customized and deployed in business-specific solutions. All of those is delivered on an enterprise service-oriented management platform that not only manages a complete information lifecycle according to IT and business requirements, but also accelerates content integration and reuse across businesses [1, 2, 21, 30].

Besides, significant adoption of tools to take the unstructured information in blogs and wikis and mine them, major adoption of collective intelligence applications and decision support, and a push by IT for governance budget for Enterprise Web 2.0 systems and applications is widely observed as well (Fig. 1).

Currently, there have been few major new technologies that reach the level importance, like Cloud computing, mashups, and SOA. They can be considered as strategic business enablers as well as technologies.

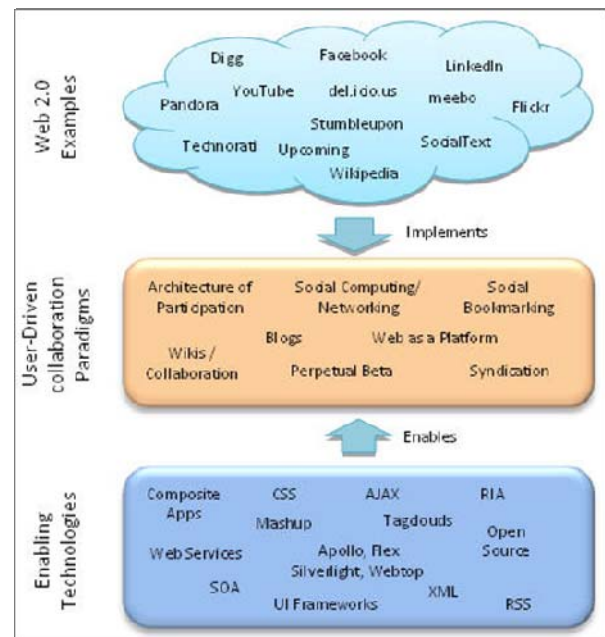


Figure 1. Enterprise 2.0 Collaborative Paradigm and its Technologies [21].

Thus, the stress to be done now on the partnering with the marketplace over the network (customer communities, cloud sourcing, and crowd-sourcing), looking for major new opportunities for low cost growth, and just doing more with less [1 ÷ 4, 22 ÷ 24].

II. NEXT-GENERATION ENTERPRISE COLLABORATION PLATFORM

Many organizations are seeking solutions that link their customers and partners with the suppliers and producers, and that smooth the flow of essential information across their value chain. The rapid growth of the social media marketplace promises to provide many opportunities to reduce information management costs, to improve the efficiency of specific operations, and to increase the quantity and richness of customer interactions [5, 26].

The right enterprise collaboration improves efficiency and productivity. But finding the proper technology solution for collaboration is a challenge. Current enterprise collaboration solutions, including standalone wikis, social software suites, and enterprise collaboration software, have serious limitations. In general, Web 2.0 technologies contribute to improved collaboration within enterprises, but they need to be tied together via a single interface to reach their full potential [4, 7, 25, 26].

A. The Collaborative Platform Potential

Although all enterprise technologies make a contribution to the ability to share information with a purpose, to reach their full potential they need to be tied together via a single interface. The best interface for doing this is the wiki, the essence of the social collaboration movement. With their ease of deployment and ability to spread virally, wikis can transform how enterprise employees access the data in their existing systems and collaborate around intranets and file servers, knowledge bases, content and project management systems. A fully realized collaborative platform with a wiki interface can serve as an integration platform for applications and secure access to data integrated from siloed sources, improving productivity dramatically (Fig. 2).

And, despite the lack of understanding of the full potential of wikis, the desire to improve collaboration and business processes has generated significant interest and hundreds of thousands of wiki deployments.

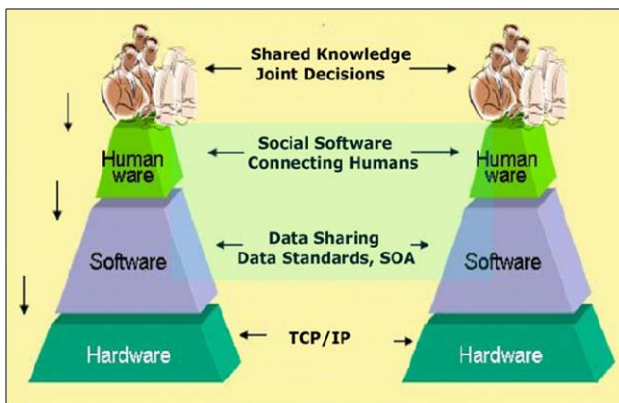


Figure 2. Enterprise 2.0 Information Interoperability Stack [27].

So, why are enterprises so interested in a technology they do not understand? - Because they know that enterprise collaboration will give them a competitive edge [7, 25, 30].

B. Integrated Business Platforms to Enable Intra- and Inter- Enterprise Collaboration

Today, collaboration has taken on a new and more sophisticated meaning. In [6], collaboration takes the form of integrated business platforms that must provide the seamless flows of information across organizational, departmental and geopolitical domains, regardless of which technologies or standards are in place. They must accommodate all of the following:

- multiple, regularly changing trading partners;

- multiple business processes;
- multiple legacy systems;
- multiple internal/external organizational domains;
- multiple message formats;
- multiple communication protocols.

To accomplish all this, today's distinct Web 2.0 technologies (e.g., blogs, micro-blogs, social forums, etc.) must be brought together under a single, efficient interface and integrated with existing enterprise systems [8, 26].

C. Wikis as the Foundation for a Collaborative Platform

On Wikipedia, anyone with the right permission can edit an entry. The advantage is that instead of working on a document in Microsoft Word on a single machine and then uploading it to the Website, and then having editors download and upload it every time they want to make changes, everyone collaborating on an entry can make changes to a single view of it, complete with conflict protection and revision history.

As a Web-centric collaboration platform (Fig. 2), even a crude and cumbersome wiki like Wikipedia removes time and distance as impediments to collaboration and facilitates the exchange of information within and between teams by making information available and usable anytime, anywhere. Everyone in an organization can capture, discover, edit and contribute content. Information is archived contextually in a logical order, ready for easy access and reuse. Beyond these simple benefits, however, wikis have the potential to add far greater value to the enterprise as the front end to a full-featured collaboration and integration platform [7, 27, 28].

D. Available Enterprise Collaboration Solutions

The enterprises can deploy few types of collaboration solutions today. Each type offers different capabilities and delivers a different level of value:

- *Standalone Wikis* - such as MediaWiki and Twiki. Many of these are based on the open-source development model.
- *Social Software Suites* - A relatively new class of solution is Enterprise 2.0 social software suites such as Jive Clearspace and Telligent, include many attractive social components, such as profiles, forums, blogs, and social networking [7 ÷ 10].

E. SOA Framework to Integrate Web 2.0 Technologies into Enterprise Applications

The majority of ERP (Enterprise Resource Planning) applications today are built using decade-old client/server technology. However, only a business application built from the ground up on top of a SOA platform is able to incorporate seamlessly Web 2.0 capabilities into a business environment.

With SOA a business process expert can link and sequence services to create new business applications. Underlying and enabling this is metadata that describes the characteristics of these services and also the data that drives them. XML has been used extensively in SOA to create data that is that is exhaustively described.

Many vendors today are transforming existing client/server ERPs into services by creating XML wrappers around them. This enables easier application-to-application and B2B connectivity. But, applications built natively on top of an SOA platform benefit from a more adaptable, process-based and real-time platform that's built for change. For example, SOA based applications have Business Process Management (BPM) capabilities at their core that allow business people, rather than programmers to re-configure and model business rules and business processes at a business level without customization or change to source code.

Thus, a business application built from the ground up on an SOA platform is able to incorporate Web 2.0 capabilities such as enterprise search, mashups and is easier to deploy, manage, upgrade and use for the following reasons:

- *Improving information findability* - SOA simplifies the process of integrating all of an organization's data sources to enable search of all enterprise data in a single search.
- *SOA simplifies mashups* - Services are designed specifically to offer functionality for reuse and for use in composite applications.
- *SOA-based applications are easy to deploy, manage, upgrade, and use* - Since the client is abstracted from the application, the architecture enables the use of any smart client against the interface, including Web browsers, PDAs and Web services (e.g., eXtensible Markup Language (XML) based on the business logic embedded in them and exchange XML using the Simple Object Access Protocol (SOAP).

Enterprise search capabilities make it easier for users to find relevant information wherever it is located on the Intranet or Internet. Collaborative Presence technologies allow organizations to harness knowledge and to work more effectively. Mashup technologies simplify integration to get the right applications into end users hands quickly. And web based technologies are easier for end users to use and for IT to maintain, administer and update enterprise applications. As a result, organizations can improve efficiency and productivity, harness knowledge through collaboration, and reduce IT costs [11 ÷ 14, 31].

III. SOCIAL NETWORKING AND CORPORATE WORLD

The social networking is a concept that federates both personal and professional environment changes, and it is at the center of this transformation. The tools and behaviors those unbounded from the consumer area are now making the transition to the corporate world with diverse implications for businesses.

The main question is how corporations are impacted and how they make the most of the collaboration-related opportunities:

1. *Corporations change the way they communicate* - social networking is bringing a broad new range of technology innovations to communications: multimedia, presence, interactivity, etc.

2. *Corporations change their vision* - As businesses become more transparent thanks to the increasing volume of information available online, employees rely more on the enterprise culture. In parallel, stakeholders seek proof of corporate social responsibility awareness, made inevitable by the growing transparency.
3. *Corporations change their organization* - Many businesses debate how they can flatten the pyramid, to gain the benefits of startups with their associated adaptability and fast growth models.
4. *Collective intelligence and customer experience lead innovation* - Many different ways to innovate are being piloted recently, all of which include collective thinking, most often through contests, but also via a regular process of gathering together employees, customers and partners from the value chain.
5. *Networking as a key to employee excellence* - People pay attention to what their online contacts mention, and use social network features to gain greater depth of knowledge in their areas of interest.

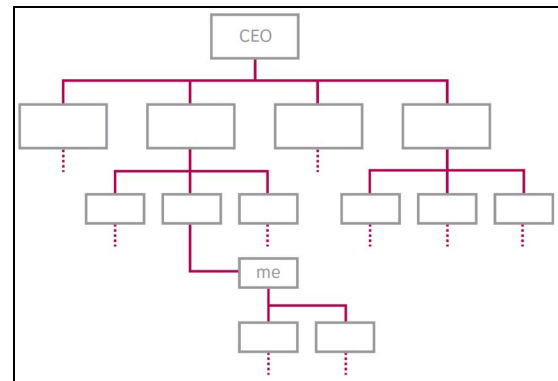


Figure 3. Hierarchical Organization Chart [15].

Additionally, social networking may allow companies to find and address new markets, creating a new branch of their strategy as well as marketing and sales practices that we could call “niche management”.

As corporations move to more collaborative activity and collective intelligence, the traditional organizational model (Fig. 3) also evolves: social networking challenges the roles and responsibilities in place today.

The Enterprise 2.0 startups often have a flat organization (the Google model) with few management layers, large groups under each manager-mentor, informal work relationships based on synergistic teamwork; their structures are adaptive and able to process information quickly enough to make daily meaty business decisions; personal connections predisposed to community work are facilitated by physical closeness and focus on projects rather than on hierarchical relationship (Fig. 4).

The second family who meets structural changes in its role and mission is the knowledge management organization (Fig. 5). The knowledge management discipline was set-up in the mid-90's to improve organizational efficiency, address critical adaptation and prevent know-how and practice

vanishing. Now that social networking boosts the establishment of links between people, sharing information and using collective thinking, the challenges for knowledge managers change.

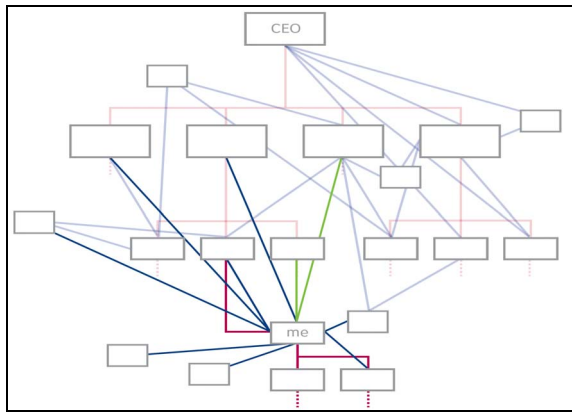


Figure 4. Future Organization Chart [15].

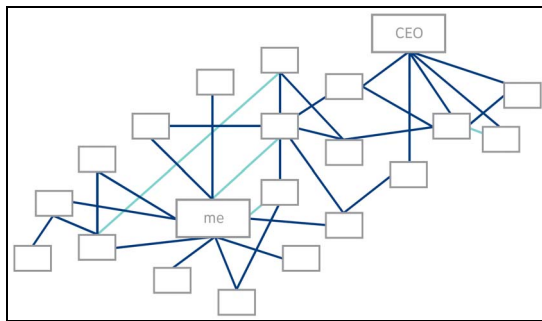


Figure 5. Network Map for Business Relationships [15].

The knowledge managers become social networking architects. Although with a shepherd style rather than a one based on compulsion: research together with the potential IT tools, survey their piloting by the business people, lead awareness information and communication. This new role definition offers a more operational footing, and is necessary for the corporation to address the increasingly discontinuous environment changes [13 ÷ 15, 28, 30].

A. Social Collaboration Layer in New Enterprise Architecture

The Social Collaboration Layer (SCL) in the enterprise architecture stack is situated under the Presentation Layer and above the so-called “Middle-Tier or Integration Layer” upon which the Enterprise Service Bus (ESB) and other messaging services like web services, JMS, etc. (Fig. 6).

The SCL contains features like Wikis, Blogs, comments and conversations, ratings and reviews, voting up and down, and other Web 2.0 functions. It renders information from various legacy applications normalizing data and flattening data architectures thus simplifying everyone’s access to information as David Wienberger so eloquently explains in his recent work, “Everything is Miscellaneous” [16, 26]. It is a Meta-Layer because its purpose is to expose information to

end users as and when they need it. Moreover, it captures the meta-data created through User Generated Content (UGC).

The Social Collaboration Layer must be capable of leveraging standards based enterprise technology assets like LDAP, SOA, Web Services, Registries, ERP, CRM, BI, etc. It improves the use and reuse of information increasing the value of corporate information assets.

Clearly, Wiki’s, Blogs, ratings and reviews, RIA, AJAX and other techno-gadgetry does not a SCL make; these are simply features that facilitate user interaction the platform that stimulates collaboration.

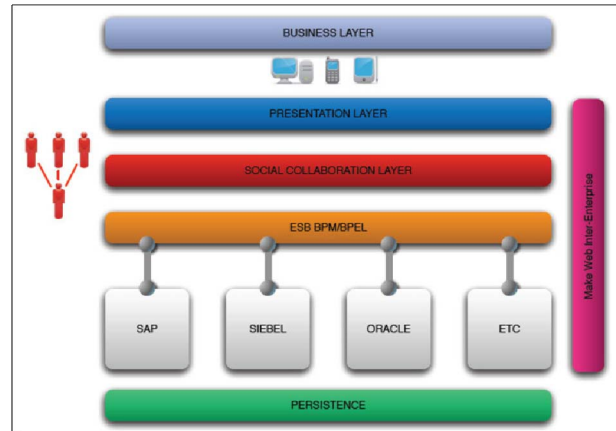


Figure 6. New Enterprise Architecture [17].

Social Collaboration platforms and applications are designed from inception for social collaboration. The SCL provides organizations with a layer that handles and manages social and informal interactions created in the new Enterprise (e.g., Enterprise 2.0). Conceptualizing the SCL allows to understand and deal with the issues of security, authorization, access control, identity management, registries, content, and multi-channel delivery through the presentation layer. It puts social collaboration and Web 2.0 into context with Service Oriented Architecture. It is also a way to introduce Web Oriented Architecture into an enterprise environment spanning information access and content creation across the firewall. It provides users with explicit self-management capabilities.

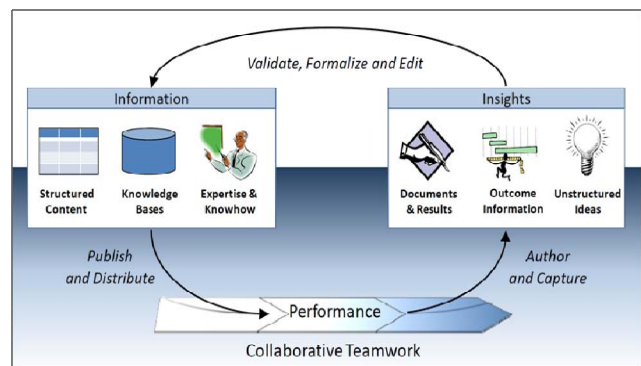


Figure 7. An example of Collaborative Environment [29].

Most importantly, it exposes information into a layer in which existing corporate information can be consumed by the end user, the knowledge worker, through any device to collaborate.

Collaboration is at the center of many businesses future vision and strategy. It enables to link information (video, data, voice, mobility) from any technology network to any human network – anytime, anyplace, through any device supports businesses catching the transition of human-to-computer interaction from individuals to PCs, and organizations to host systems; to groups of people collaborating with each other about sports teams, events and celebrities (Fig. 7). As a technology abstraction, the social collaboration layer provides the technical perspective on how to integrate existing technologies and assets into the social collaboration [17, 18, 28, 31].

B. Syndication-Oriented Architecture or Middleware for Connecting Applications to Users

The core element in the Service-Oriented Architecture concept is an Enterprise Service Bus. It routes messages and notifications between any services, whether developed in-house, purchased from a third-party, or hosted over the Internet. A comparable concept exists for integrating the complete workflow between people and applications. Routing messages and notifications between applications and their users is defined as a Syndication-Oriented Architecture.

If company deploys Service-Oriented Architecture for connecting the various stages of the service process, it becomes a lot easier to inspect messages and notifications and collect new statistics that are not readily measurable by any one component. However, every of those components also has a user interface, and the unstructured data they pass along in comment fields, in email updates, in error messages, and in all of the other ways applications connect to their users suggests an equally intriguing new concept, e.g., the Syndication-Oriented Architecture.

The syndication is new communication pattern for the Internet that lies between client/server and peer-to-peer. In its broadest sense, syndication is a business model where content (e.g. TV shows, columns, or comics) is systematically made available for re-use. On the Web, the most common way of expressing the portions of a site intended for re-use is a feed format such as RSS or Atom that lists the headlines, authors, and links currently available. The specific sense in which syndication becomes the basis for software architecture, though, is how those feeds are subsequently advertised and aggregated: a pattern of communication where senders do not necessarily know who the receivers will be, but does not broadcast to every potential receiver, either.

The key benefit of a SynOA is analogous to a SOA’s: rather than hard-coding integration hooks from one stage of a workflow that explicitly invoke the next, separating out the messages allows workflows to be choreographed externally and enhanced incrementally. It is not needed to decide in advance who needs to know; users who do can establish their own rules for staying side by side of enterprise events.

The RSS and Atom syndication and aggregation, in conjunction with instant messaging and presence tools, can enable a standards-oriented syndication service to deliver such notifications to the right users, at the right time, on the right device, all without rewriting individual applications.

SynOA guides the deployment of a wide range of ancillary services that can better manage information overload:

1. *Publication* - adopting a single syndication schema.
2. *Subscription* - adopting a single subscription interface for matching new content that allows multiple query languages.
3. *Distribution* - adopting a single distribution interface for all of a user’s notifications that support a wide range of protocols and devices.
4. *Personalization* – the “fine-tuning” information streams for each end-user.
5. *Collaboration* - can power entirely new social-network analysis of readership, detecting the spread of new ideas, and enhancing how teams share knowledge inside and outside the enterprise.

The broader potential of the SynOA concept is that it can help orient architects among the plethora of syndication tools and platforms already on the market by classifying the sorts of features and customizable components to expect. Each of the five concerns described below can be viewed as layered of both complexity (cost/benefit) and functionality (feature dependency), as summarized in Table 1.

TABLE I. SYNDICATION-ORIENTED ARCHITECTURE – FEATURES AND BENEFITS [19].

Concern	Features	Benefit
Publication	Upgrading all human-readable messages to use standard formats; and converting existing ‘pull’ systems to ‘push’.	Ensures flexibility, security, and unifies real-time monitoring of all systems.
Subscription	Simple ‘envelope’ filtering of article headers as well as richer queries against XML ‘bodies’; and customizable rules for de-duplication and trend detection.	Empowers end-users as well as developers with ‘self-service’ access to enterprise knowledge.
Distribution	Unifying a single distribution interface that spans multiple protocols & devices; and ‘track-and-trace’ to guarantee delivery or escalate.	Assures users that the alerts are pushed according to their online presence.
Personalization	Keeping track of every alert delivered to enable relevance-feedback analysis, detect duplicates, and bookmark/tag past events. UI Customization.	Increases efficiency by minimizing interruption, without compromising discovery of new information sources.
Collaboration	Keeping track of the relationships between events and people, to enable social-network graph analysis and detect trends as information spreads.	Continuously optimizes the entire organization’s attention to its internal and external stakeholder communities.

Enterprise application integration has made great trends with Service-Oriented Architecture toward managing all the

“hard” data flows between operational systems. Syndication-Oriented Architecture is a blueprint for managing all of the “soft” data that flows from applications to users and between users as well. In this light, syndication standards can enable “information agility” for all of the knowledge assets flowing inside and outside an enterprise [19, 20, 23, 26, 28].

IV. CONCLUSION

The businesses have been going on now in a particularly cruel economic climate. For many companies and industries it is almost as hard to see how things get worse as it is to understand how things can get better. To survive and thrive, organizations are looking to make the most of what they already have while gearing up to the conditions of an unknown landscape of challenges. These concerns impact the majority of the Enterprise Web 2.0 forecasts, though not all [1, 2, 22, 23, 30].

On the other side, the rise of collaborative networking in the enterprises, wide adoption of mobile applications and other progressive IT technologies by businesses, influence enterprise development progressively.

Thus, the aim of this paper was evaluating the role and place of collaborative platforms in new generation of enterprise management paradigm dependent onto the social collaboration tools, e.g., how they can challenge but also impact positively.

Additionally, we have outlined the impact factors of social networking onto corporate world including placement of a social collaboration layer in new enterprise architecture.

Our future research plans are lying into the investigation of adaptation challenges and evolutionary processes of social networking and tools by the enterprise business collaboration along with developing a view/prediction - what can be expected further.

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