A Proposed Framework to Simplify Enterprise Network Management

Why Microsoft with LinkedIn Has the Right Elements to Deliver It

CIMdata Position Paper

Key takeaways:

- *Given the rapidly changing technology and business landscape, Enterprises should reevaluate their innovation and network management practices with new lenses. Especially it is critical that enterprises address the functional "data silo" problem which leads to inefficiencies in development of new products and services, and reduces their scale advantage.*
- *CIMdata's proposed digital framework described here links People, Organizations, Projects, and Applications/Tools through visible profiles. This framework aligns better with how a business deploys resources to achieve its innovation goals.*
- *Enterprises have significant opportunities to improve trust and engagement of their key stake holders by adopting CIMdata's proposed digital framework within a more open culture.*
- *With the recent acquisition of LinkedIn, Microsoft now has a "proven" approach to implement the network management framework that is proposed by CIMdata.*

There is no more debate. In today's accelerated and connected economy, turning an idea into product innovations that customers need requires integrative thinking and multi-disciplinary collaboration, often including industrial design, science and engineering, process engineering, and hardware and software engineering. Given the diversity of expertise and knowledge that must be integrated to create new innovative products and to introduce them successfully to the correct markets, collaborative innovation is a must—no one can do it alone. Enterprises must leverage collective intelligence in their ecosystems to continue to fuel their growth through innovation and new product development.

Collaboration is a basic human endeavor. We need to connect, communicate, and collaborate to meet our basic emotional and physical needs. To do so, we quickly adopt to those technologies and tools that make our connectivity, communication, and collaboration with others easier. Wide-spread adoption of mobile devices and social media platforms such as Facebook and LinkedIn in our personal lives is a testament to this fact. Yet, despite technology advancements, enterprises continue to suffer from inefficiencies in collaboration and network management. Often collaboration breaks down due to difficulties associated with managing relationships in geographically distributed teams, processes and tools that create data silos, and differences in cultural norms and personal practices. Intranets are full of stale knowledge capture spaces, be it MS SharePoint sites or Wikis, that were once part of "hot" knowledge management initiatives.

As more business decisions need to be made in real time based on data that is constantly streaming from all corners of the world—from consumers, partners, employees, and smart connected products and manufacturing systems—it is critical that enterprises overcome inefficiencies that prevent them to unlock value from their innovation networks. In today's digital age there is significant customer value creation opportunity for enterprise software providers who can help organizations streamline and simplify collaboration. In this paper, we propose a high-level enterprise innovation network management architecture that supports

this objective, as well as explain why CIMdata believes, with the acquisition of LinkedIn, Microsoft now has all the right elements to support the implementation of this framework for their enterprise customers.

Functional Processes and Practices Create Data Silos

While multi-functional team collaboration has become the norm for new product development, enterprises still depend on functions to develop and manage processes that are critical to achieving innovation. These fragmented processes and associated data silos can cause significant inefficiencies in the overall innovation and product development process, and network management. Here are a few examples:

- Externally submitted ideas are kept in a database by the organization that manages the external innovation portal.
- R&D manages collaboration with academic institutions and external labs, and often resulting learnings and insights remain in reports that are locked away in personal computers. With frequent personnel changes, which typically happen in large organizations, these learnings and insights may not be transferred and realized as innovations.
- Human resources sequesters employee skills and experience related information. As a result, people do not fully understand each other's backgrounds and talents.
- Purchasing manages supplier relationships and associated data that results in innovative ideas from suppliers that do not find their way to the right decision makers to be included in innovation planning.
- The legal department manages legal agreements and keeps them locked. People may not know that similar agreements exist with the same external partner.

Typically, there is no digital mechanism that links data across these functional silos for a given context. Given this reality, it is difficult for an enterprise to maintain a holistic corporate memory about what has been done or is being done. Even the simplest questions, such as "Has this idea or solution been shared with us before? What has been decided, and why? Have we worked with this company before? What was done with them? What was our experience like?" are hard to answer. People are the connectivity enablers and they are therefore consumed by a never-ending flood of emails and meetings. In today's fast moving digital world this is unacceptable.

Wasn't Social Media Software the "Answer?"

About a decade ago, when Web 2.0 social collaboration tools emerged and were packaged as Enterprise 2.0 for business, hopes were high. The argument was that by adopting these tools businesses would resolve their connectivity, communication and collaboration issues, streamline their processes, eliminate unnecessary meetings, easily capture and reuse knowledge and identify experts, find better ideas, and make better decisions. Indeed, some benefits were gained, but these often fell short of expectations. Lack of adoption, which is well characterized in a recent academic study,[1] is often cited as a reason. The question is:

[1] Enterprise collaboration systems: an analysis and classification of adoption challenges. Available online at http://www.sciencedirect.com/science/article/pii/S1877050916323079

"while the users are adopting social media in their personal lives, why are they having difficulty using these tools in their work environment?"

Enterprises often implement two types of social media software: general purpose and special purpose. General purpose software solutions are primarily implemented to support better communications and information sharing across teams, communities, and networks. Example solution providers in this category are Microsoft, IBM, Jive, Salesforce, Atlassian, and Google. Special purpose products are, on the other hand, aimed to improve a business activity such as ideation, innovation management, and product design collaboration. Many of these solutions have social features, e.g., discussion threads, likes, and comments, like the general-purpose solutions, but in addition they provide features that support their target activity, for example, analytics for idea evaluation and advancement. Special purpose social solutions cover a wide range of activities across the product development lifecycle, and covering them here with examples is beyond the purpose of this article. In regards to innovation and idea management, Brightidea, e-Zassi, Hype, Imaginatik, Planview, Sopheon, and Spigit are example solution providers. Leading PLM solution providers such as Siemens PLM Software, Dassault Systèmes, Aras, Arena Solutions, Oracle, and PTC provide secure social technology that can be used to enable visual design collaboration and allow design partners, suppliers, and external manufacturers to participate in online collaborative discussions.

When implemented with a strategic intent, enterprises gain benefits from social media software. However, these solutions do not address the fundamental problem of organizational and data silos. In fact, they often create their own silos.

CIMdata's Proposed Enterprise Network Management Architecture

Enterprise digital system architectures of today are a reflection of business management philosophies of the 20th century. A large organization is divided into functions that have responsibility for development and maintenance of expertise in their business area. Functions are often divided into departments to manage different aspect of the function's work. Each of these functions and organizations design their own processes and tools. The project teams are multi-functionally formed to deliver new innovation and product development. Their work is organized by program and project management functions. The net effect is individuals in large organizations wear multiple hats, and must deal with multiple fragmented processes and data sources in their daily work lives. They waste significant amounts of time searching for information and providing information to others.

We think that there is another way to architect the system for simpler and more efficient enterprise network management to maximize value from collective intelligence for innovation and product development. And, this architecture should not require designing new processes or moving data.

Enterprises deploy two key resources to achieve their innovation and new product development objectives: people and money (budget). Peoples' activities are the source of new knowledge and information that together define and realize new innovation. A budget enables peoples' new learning activities. Programs and projects are the vehicles for deployment of people and budget to do the work. People belong to organizations (i.e., to functions, departments, teams, communities, and/or networks), be they internal or external. And people use digital tools and applications to accomplish and communicate their work. Therefore, each of these elements—people, organizations, projects, and apps—should have

visibility in a digital innovation system and be connected as shown in Figure 1. This is the essence of CIMdata's proposed Enterprise Network Management Architecture.

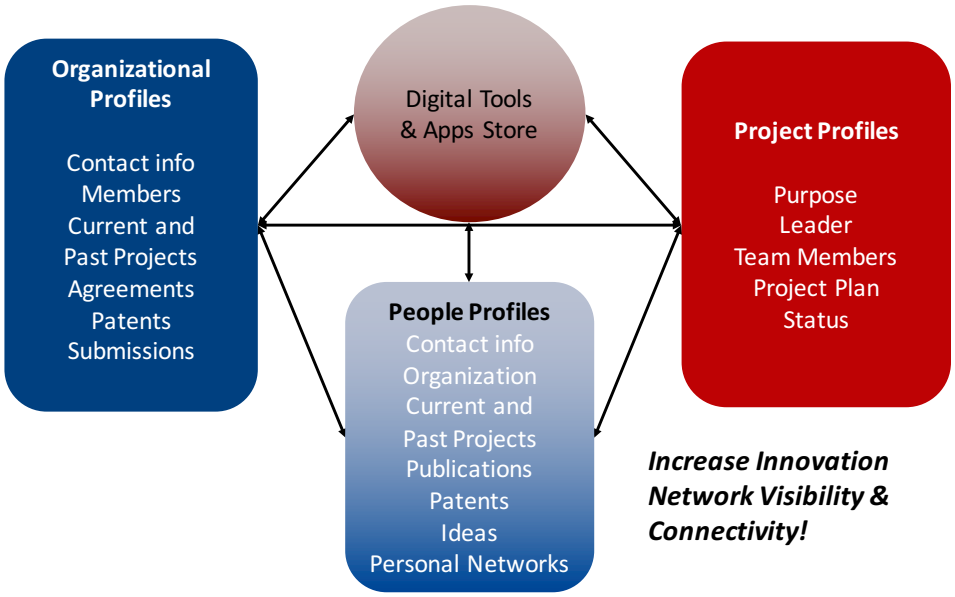

Figure 1—CIMdata's Proposed Enterprise Network Management Architecture
In which Profiles collect data automatically from various disjointed systems

Digital visibility of people, organizations, and projects can be achieved by creating profiles for each of these elements. Preferably, profiles are populated automatically with people's on-going activities, eliminating the need for manual entry. Some data could come from systems managed by functions such as HR and Legal. This will allow for data integrity. However, data exchange and interoperability between the systems should be enabled across an enterprise's business platform that enables its end-to-end processes and data connectivity. A smart search and recommendation engine should help users find information and connections when they needed them, as well as discover them at the right time.

Can Microsoft with LinkedIn be the Answer?

Microsoft Office products (e.g., Outlook, Word, Excel, PowerPoint, SharePoint) are widely adopted by enterprise users to accomplish their daily jobs. With hopes to accelerate adoption of their enterprise solutions, many other solution providers offer interoperability of their innovation management and product development software solutions with Microsoft Office. However, in many cases interoperability means users can input from or record outputs to Microsoft products. Otherwise, activities and therefore data, mostly remain in their own applications silos.

In an online article[2] published in October 2016, LinkedIn revealed how it uses machine learning techniques to build and manage a dynamic knowledge graph using the large amounts of user-generated content from their 400 million plus members, as well as data from the Web. The LinkedIn's knowledge graph composed of entities such as members, jobs, titles, skills, companies, geographical locations, schools, publications, etc., is shown in Figure 2. Imagine LinkedIn's approach being operationalized within an enterprise with the following examples:

[2] https://engineering.linkedin.com/blog/2016/10/building-the-linkedin-knowledge-graph

- Employee LinkedIn profiles show people's roles for projects linked to the knowledge artifacts they created for these projects, for example, models, reports, presentations, etc.
- Organizational profiles connect with their member profiles, as well as profiles of other organizations with which they are collaborating (or have collaborated).
- Project profiles are linked with profiles of the people who are working on the project, and their knowledge artifacts for the project.

Easy to adjust security rules allow people to make some parts of their profiles public, and restrict other areas that need to be protected. People continue to enrich their profiles with their ongoing work, and are able to exchange information with others in their daily workflow using social feeds. When they move to new projects or change roles they update their profiles. This automatically updates their connections and realigns the context of their work. Now imagine how this compares with today's connectivity depicted in Microsoft's graph in Figure 2—documents, emails, messages, contacts, calendar items, etc., are linked, but the context is missing (see the blog referenced above for a more detailed discussion on this topic).

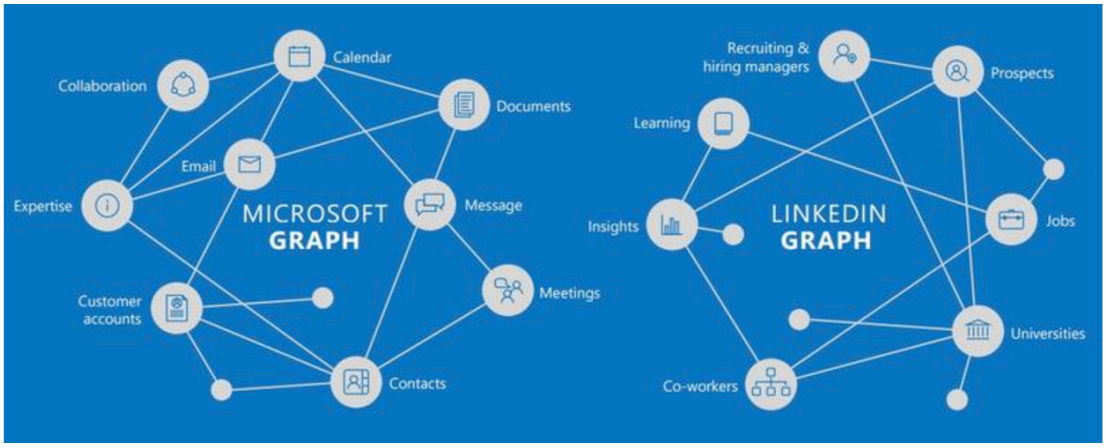

Figure 2—Depiction of the Microsoft Graph and LinkedIn Graph today (Ref: Building the LinkedIn Knowledge Graph Blog)

With the recent acquisition of LinkedIn, Microsoft now has the ability to help their enterprise customers to greatly simplify their Enterprise Network Management with benefits that LinkedIn users enjoy today. In other words, Microsoft has the right of way to create a 21st Century network management framework that is proposed by CIMdata. Let's hope that they pursue this sooner rather than later.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at http://www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.