



The Journey of Software Integration: How Organizations Make the Leap from Copying Data to Cross-Company Integration

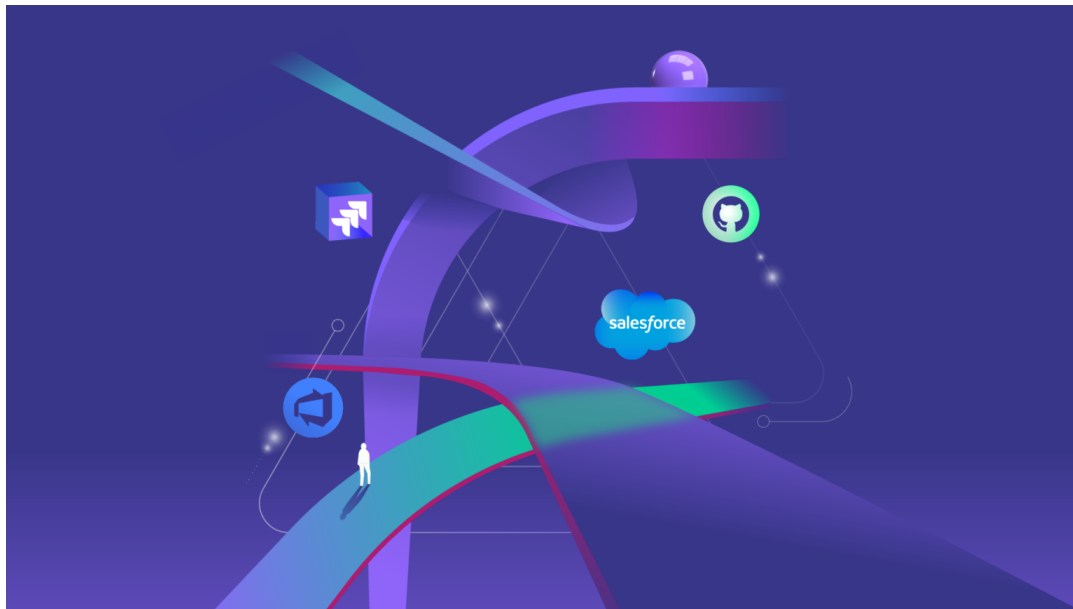


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There has always been a need for accurate and timely business-to-business information exchanges. However, with businesses evolving at the speed of thought, the need for such data has become even more essential. This need is actually the reason why work management systems were created in the first place.

Moreover, the proper integration of the underlying data guarantees the speed and security of sharing information and becomes a crucial part of data transformation.

But why do we need to tell the story? Well, because data integration, and more specifically [cross-company integration](#), is becoming more and more popular among companies. We envision more companies will start to interconnect creating a global network of linked companies.

This requires a structured approach to data integration. Moving from stand-alone computers to integrated networks is for sure an evolving journey. And each step in the journey has its own set of challenges.

Introduction

Less than 30 years ago, this was hardly an issue. Before the 1980s, only the largest corporations had computers powerful enough to process data using terminals. Most of this was pure data processing; very little information exchange was happening. Even the coming of the microcomputer and the affordability of standalone computers didn't change this much. Data flow and automated information exchanges occurred only within the borders of a corporation.

Information exchange wasn't even an issue for most companies until technology allowed the commercialization of the internet in the late 90s. Until then, this interconnection of computers via networks was somehow not even in the picture. It was hard enough to integrate data between departments within the same company. Data exchange between companies was somewhat fragmented, departmentalized, and challenging to use.

1. Work management systems are everywhere

As computers became more and more interconnected, innovative business thinkers began to see the advantages of developing automated work management systems. And because world economies began to move past industrialized economies, it all became even more knowledge-based. Hiring knowledge-based employees is an expensive proposition since knowledge workers can ill afford to be idle.

Our knowledge-based workforce has become empowered through workflow management processes. These automated processes provide structure to the movement of information as it passes through a company, streamlining and transforming data into meaningful data that can improve performance, enhance decision making, and optimize results.



Work management systems are a set of software products and services that are developed to automate and enhance workflow management. Through the integration of data in a company, they create efficiencies for knowledge workers that compress cycle times, clarify statuses, and allow for timely escalations as needed. The need for wasteful meetings is consequently reduced as managers now have a host of meaningful information at their fingertips.

2. Efficiency stops at the door

Unfortunately, these efficiencies usually stop at the borders of a company. Although companies might be internally organized in a very efficient way, these efficiencies are generally lost the moment that a company needs to work with another team from another company.

Because systems between companies are not integrated, these inefficiencies often cause friction between partners resulting in:

- Lost time
- Misunderstood information
- Unclear statuses
- Wrong escalations
- Missed Service Levels
- Numerous meetings

In an effort to resolve these issues, companies begin a journey to integrate systems to maximize information exchanges between them.

Although the objective is promising, the challenge is to integrate these systems without interrupting the internal workflows. Achieving that goal is what we call the integration journey.

3. The Integration Journey

Integrations between companies mostly happen indifferent to the underlying technology. The need for timely and accurate information exchanges drives the need for some type of data integration. So companies begin this integration journey out of necessity. The natural progression of this journey usually starts with the simple but very inefficient method of manual data transfer. And it ends with a realization that cross-company integration is best accomplished through the use of some flexible integration tools.

3.1. Manual Data Copying

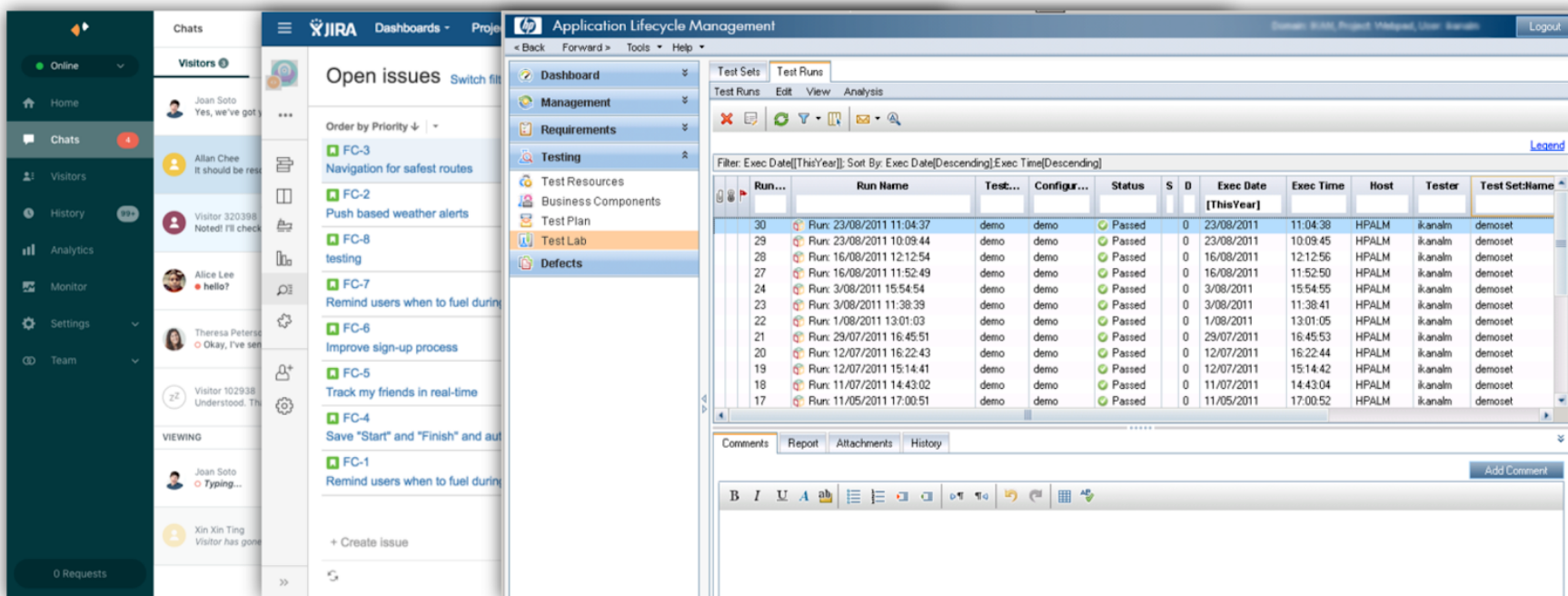
Manual data transfer is usually among the first attempts many companies make to integrate data. This is often something as simple as a cut, copy, and paste of exchanged emails from one company to another. Initially, this might seem like the only method of data exchange. While very inefficient, companies may see it as their only viable way because of inadequate understanding of data needs, unwillingness to invest in technology strategies, data security concerns, or governance issues.

The manual copying of data is also prone to issues of accuracy, timeliness, and security. That's why most companies will quickly move away from this process. It puts a human in the middle of the process, which makes it liable to error. The manual transcription of data from one system to another requires a person to timely transcribe the data, accurately copying it from one system to another. Every step of this manual process has the potential to introduce critical errors or excessive delays, which fly in the face of any efficient workflow management.

3.2. Sharing Your Environment

The next logical step that many companies take in data integration is by sharing one environment with the other company.

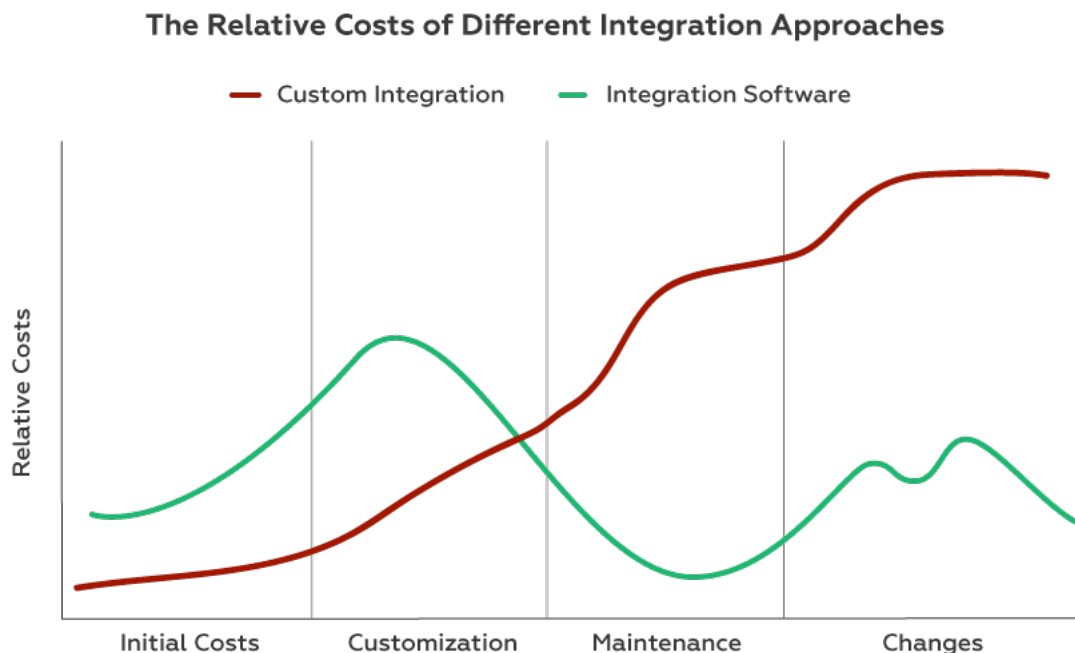
While seemingly an improvement over the manual copying of data, sharing your system with other companies can be cumbersome. It can put the host's security at risk, and the unfamiliar environment is a disadvantage for the guest. These shared work management systems may also expose critical proprietary data that is unintended for partnered companies. And GDPR considerations are another potential pitfall.



3.3. Building your own Integration

At some point during these early integration attempts, companies eventually come to realize that the manual data transfer or even the use of shared environments does not meet business needs for confidentiality, integrity, availability, and timeliness. At some point, there is a realization that there should be a better approach to the integration of data between different companies.

This is when companies explore a 'build versus buy' comparison of developing or acquiring an integration software. Companies with a large in-house programming staff are often tempted to build their own custom integration. However, as the relative cost charts show below, creating your own data integration software is most often a rather expensive proposition compared to buying a third-party solution.

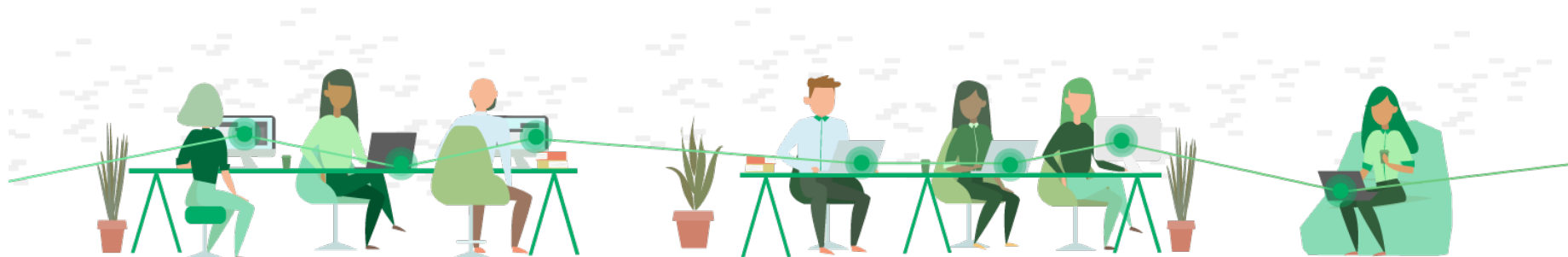


While the initial costs and customizations may be relatively inexpensive by using an internal development team, the ongoing cost of maintaining the customizations and implementing changes is significantly higher over time. The initial maintenance may not seem too problematic, but it can become difficult over time. Maintaining the expertise on an in-house customized system also proves costly. Moreover, internal teams are not usually diligent enough to maintain the proper software documentation. So when the key talent leaves, these systems become unwieldy to continue.

On the other hand, although the startup costs of integration based on a third-party solution might be more expensive, these costs will decrease significantly over time once the initial integrations are completed. The companies behind these software integration solutions also provide levels of expertise, training, and documentation.

4. Towards a Worldwide Network of Connected Companies

4.1. Peer to Peer Integrations

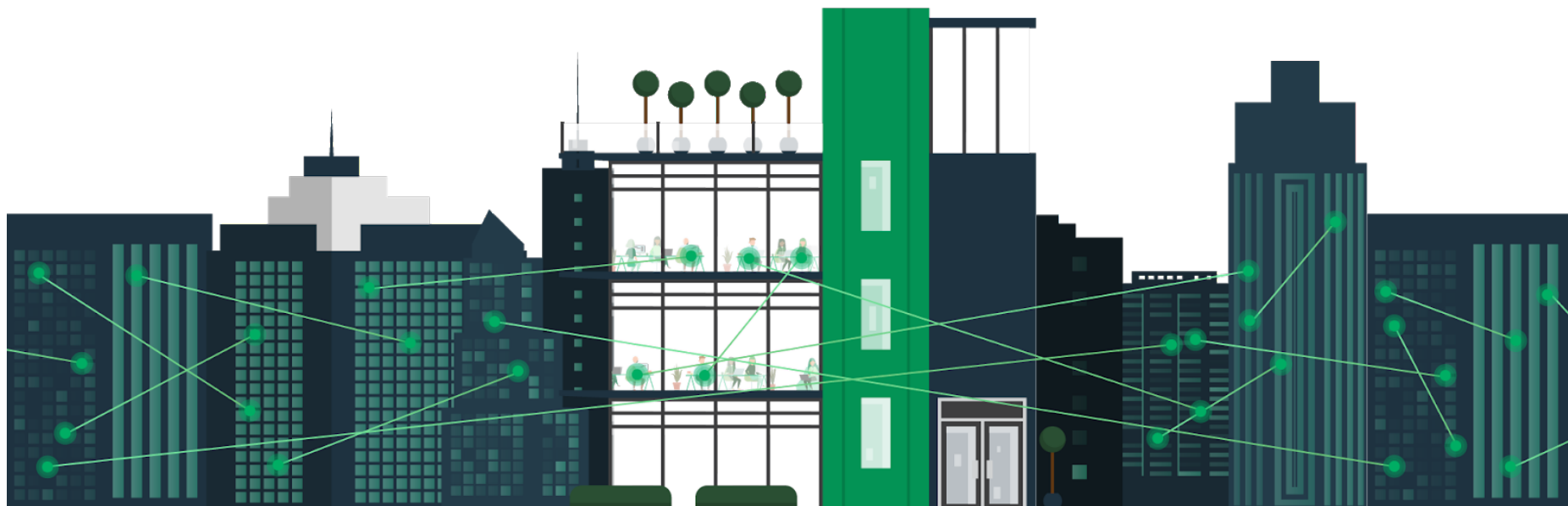


A peer-to-peer integration is the first step whenever companies consider integrating beyond the company borders

These peer-to-peer integrations involve defining specific integration requirements like looking at the use cases and specific data values, orchestrating the data into all the proper workflows, planning for side effects, and ensuring all system integrators.

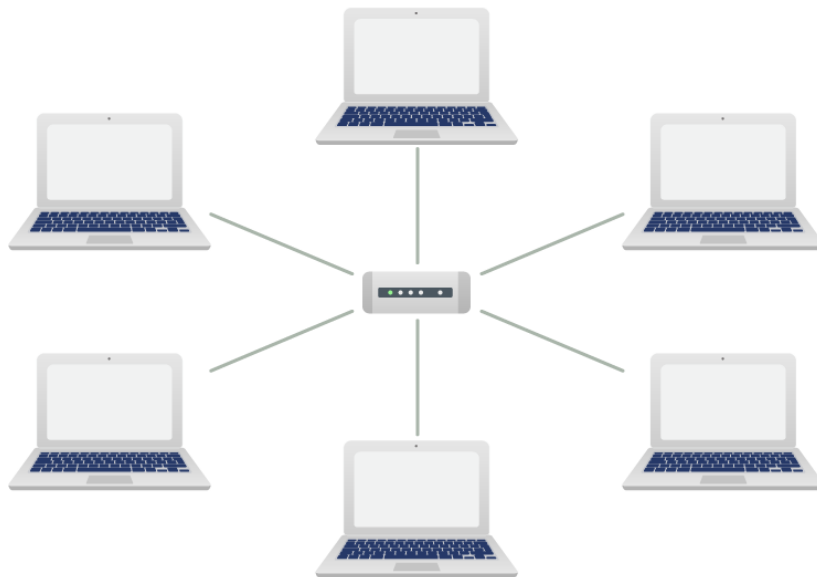
4.2. Clusters of Companies

Seeing the benefits and efficiencies of this peer-to-peer integration will encourage companies to move from peer to peer to forming clusters of connected companies that will work in a structured manner.



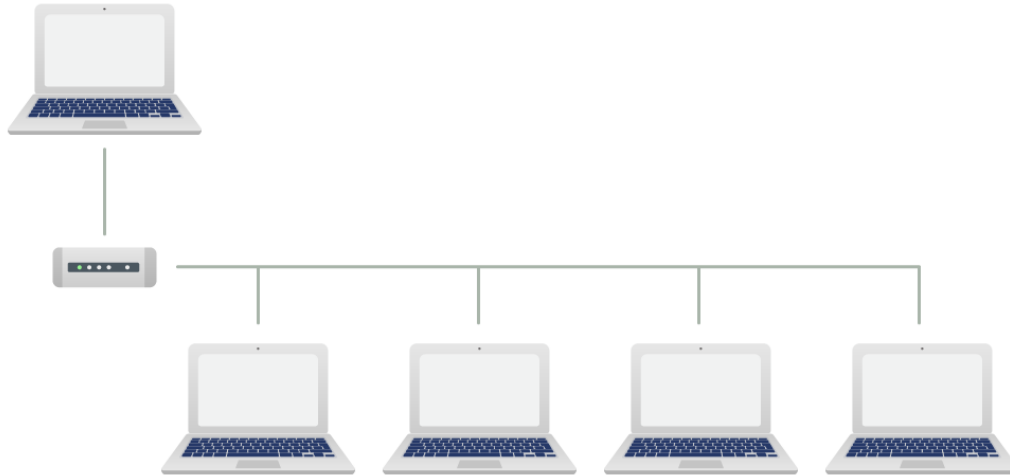
Take a logistics supply chain as an example. A physical retailer typically deals with many different suppliers of products, who, in turn, may rely on several different independent shippers. All of these companies need to work seamlessly together to move products and services from predicted demand to the retail customers who need products or services. By integrating the quality management system with the issue tracking systems of the suppliers, tracking delivery issues can be done with a lot less friction.

4.2.1 Some examples of clustered company networks

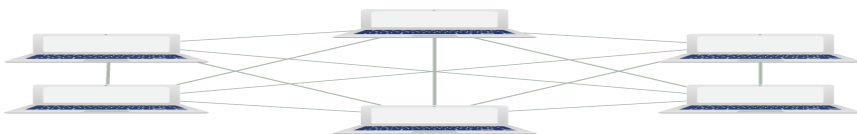


A common peer-to-peer integration is based on a 'star' concept. This integration is developed from a central company out to external peers, as needed. Its pairings are all linked in peering relationships to a primary company, and each point in the star represents an

individual peering only with the central company. This type of data integration assumes that no other relationships are needed except those with the company in the center of the star.



Several different types of peer-to-peer integrations are possible. The graphic above illustrates a serial type of integration, where companies would develop peer-to-peer integrations in a 'train' concept. Developing 'train' or serial peer-to-peer combinations may prove to add inefficiencies and complexities in management workflows. Nevertheless, where workflows happen between companies sequentially, these serial peer-to-peer integrations may prove useful.



The most sophisticated type of peering is a 'mesh' peering, where companies move past individual peer-to-peer integration relationships and move to mesh relationships. As shown in the graphic, some companies can have more than one integration relationship with other companies. We see that each one of the companies has four other peering relationships. While these integrations might seem complex, they can hold out the promise of optimal work management, both inside and outside of the company.

4.3. The Global Network of Companies - the Integration Network

Will these clusters be the final stage in the integration journey? Or do we dare dream bigger? Is there a 'global integration grid' of companies that seamlessly integrate with each other?



There are many issues to consider in the ethical, regulatory, business, and technology domains. However, we believe the future promises the prospect of a [global network of connected companies](#). In this futuristic vision, companies will be able to connect their internal system to a worldwide network of related companies and start information exchanges at the flip of a switch.

Conclusion

What is the ultimate goal of this integration journey? The holy grail of this long journey of data integration and seamless information exchanges may indeed be a global network of 'on-demand' integration. Integration where the business factors of cross-company integration are the driving force, not technology. In such an environment, companies would be able to connect to the global grid of interconnected companies and start information exchanges in the blink of an eye.

Nirvana? Perhaps. But companies that specialize in developing software integration have made tremendous strides in making cross-company integration a reality. Challenges still remain. However, the more these companies facilitate the movement to a seamless global grid of interconnected companies, the higher the promise of optimizing workflows within your company, without worrying about how it will affect your partners. It will indeed allow goods and services to be delivered on-demand, at the speed of thought.