Building the Business Technology Agora

With Capgemini’s TechnoVision
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The New Relationship Between Business and Technology

With the new millennium began a new era of Information Technology: It became part of our lives. It expands our brains, multiplies our relationships, moves with us.

Information Technology also started to become part of the lives of enterprises and administrations. No longer just an indispensable support function, but an expansion of the organization’s intelligence, a universal connector, the way to become adaptive, the generator of new ideas, new products, new services, new business models.

With executives, employees, partners, clients and customers experiencing Information Technology in a new way, with business making technology its own, we need a new way to deal, jointly, with business and technology.

The ambition of Capgemini’s TechnoVision is to trace this new approach. Introduced in October 2007 and undergoing continual development, Capgemini’s TechnoVision provides the tool for business and Information Technology to enter a new era of dialogue and united construction.

This new era is the era of Business Technology (a name proposed by independent research firm Forrester Research, Inc.)

Based on our work with many clients, Capgemini’s TechnoVision has evolved into a simple and powerful approach to understand Business Technology and discuss its consequences for enterprises and administrations.

This booklet describes TechnoVision’s state-of-the-art. It starts with the Agora – the place where business and technology meet. It shows how business and technology people prepare themselves for fruitful exchanges on the Agora, how the results are captured and how they lead to actions.

Of course, such a booklet can only show a general picture and give a taste for Business Technology. We at Capgemini are keen to engage with our readers to help them come to grips with the new world of Business Technology, and how to move there.

With business making technology its own, we need a new way to deal, jointly, with business and technology.

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The Necessary Dialogue

High, thick walls separated business and Information Technology. Different people, different languages, different time lines, different measurements. As a result, one had to throw “requirements” over these walls, and wait for the corresponding applications in return.

The advent of Business Technology requires a very different relationship. Business and technology people have to meet, understand each other, act in concert.

Capgemini recognizes this need and introduces the Agora.

We are familiar with the Greek Agora. This is where citizens gathered, discussed, disputed, concluded, transacted. The new Agora is where business and technology people gather, discuss, dispute, conclude, transact. They define what needs to be done, and distribute the work to the surrounding workplaces. Instead of manufacturing weapons, crafting amphoras and building bridges, the modern Agora’s workplaces manufacture processes, craft systems, build products and services.

Our Agora is the BusinessTechnology Agora. It is designed to make the meeting of business and technology minds happen. For this purpose, business and technology people must come to the Agora equipped with powerful tools, the tools of their trades.
The Necessary Tools
Discussing “freely” on the Agora would not produce smart results. It would only perpetuate the misunderstandings, maybe even deepen the gulf separating business and technology people. For a productive, targeted exchange, the participants need to prepare the tools of their respective trades.

The business people enter the Agora equipped with their BUSINESS DRIVERS. Not only do they know what they want to achieve, they also know how they want to achieve it.

Business drivers are not just business objectives or, worse, intentions – they are, as the name indicates, the levers used by business to change the business, going after opportunities or resolving issues. Each lever is a project, under way or under consideration, defined crisply and jargon-free. Taken together, the drivers describe the evolution and progress of the organization.

The technology people enter the Agora equipped with CAPGEMINI’S TECHNOLOGY CLUSTERS. Not only do they know how technology works today, they also know how technology is evolving.

The seven clusters build a clear landscape of technology and trace its expected evolution. Capgemini is ideally positioned to provide this clear and balanced picture. Our technical communities, notably the one networking our Chief Technology Officers, look at technology without prejudice, with the objectivity that Capgemini’s independence and dedication to services permit. To facilitate the Agora exchanges, the clusters are described in terms that make sense for everybody.

Thus equipped, business and technology people will be ready to meet on the Agora. Each dialogue, between one business driver “representative” and one technology cluster “representative,” will generate specific Business Technology insights. The sum of these dialogues will be a full picture of business and technology.
Business Drivers

What Is a Business Driver?
A business driver is a significant effort within an organization to execute a strategy, correct an issue, exploit an opportunity, boost an innovation, ensure compliance or cope with disruption. The driver finds the “pin code” of the organization, unlocks its energies and makes it operate at a higher level.

What Sorts of Business Drivers Do We See?
There are two major types of drivers: the generic ones, common to companies and organizations of a given segment or sector (such as retail banking, or a country’s local governments) and the specific ones, specific to one company or organization. It turns out we need the specific ones most.

We have identified a wide variety of drivers – over 300 – which can be grouped in a few categories:

1. Strategic business drivers – A TechnoVision without at least one of these is hard to imagine. They define the growth or differentiation strategy of an organization. They should not be confused with higher-level statements that express the mission and vision of an organization.

2. Translations of general trends (aging population, globalization, etc.) are important when they create a disruption or an opportunity, and therefore require a major company project.

3. Execution-related drivers focus on efficient and flexible execution within the organization or its supply chain.

4. Finally, there are drivers related to corporate behavior (doing things in a responsible manner) or to corporate hygiene, like avoidance of risk and compliance issues.

Business drivers are not static, they evolve over time and depending on the circumstances. Which implies that any list needs to be revised periodically.
What Makes a Good Business Driver and a Good List of Drivers?

A significant amount of effort needs to be invested to come up with well-formulated, shared and concrete enough drivers.

They should be distinct and crisp, with a defined effort, a clear end goal and timeline, and represent a workable and action-oriented statement about a desired future state. Drivers should not be too broad or too narrowly defined, such as something that only holds for a small group within the organization.

“Eternal truth” statements like “we are a people company” are of little value in a meaningful discussion about Business Technology. Examples of good concrete drivers include “being able to integrate over 50 acquisitions per year into the operations” or “being able to accommodate 1 million new mobile subscribers per month.”

A total of four to six drivers is the right number: some of them short-term oriented, some of them longer term; some focused on a specific important issue or opportunity, some more strategic. One or two should be truly disruptive for the organization.

In the end, each organization will have to make its own strategic choices and define its own drivers. We found, however, that guidance and inspiration is needed to create a good list of well-formulated drivers. References and examples, especially from other industry sectors, usually lead to stronger drivers.

Business drivers should be distinct and crisp, with a defined effort, a clear end goal and timeline, and represent a workable and action-oriented statement about a desired future state.
Capgemini’s TechnoVision asserts that the ongoing evolution of technology creates **freedom** for businesses, notably in two ways.

First, technology opens up vast opportunities for **new value and innovation**: It provides organizations with the freedom to choose where they want to focus their energies, thus helping them achieve their business objectives.

Second, and it is a prerequisite to unlocking new value and innovation, technology **liberates** organizations from the burden of having to manage assets that do not contribute to differentiating value, yet consume a disproportionate part of budget, time and resources. Technology helps us free ourselves from current constraints and obstacles through simplification and standardization.

**Identifying and Understanding Technology Trends**

Our analysis of technology developments led to 21 important technology trend areas that are likely to have a profound effect on business, now and in the forthcoming years.

We then structured these 21 building blocks into seven technology clusters (using color-coding). These clusters have the right granularity to be used in the dialogue between technology and business people, mapping the business drivers of an organization in a simple and effective way to the technology areas that may address them.
What is a Technology Building Block?
A technology building block is an important technology trend area that is likely to have a profound effect on business, now and in the forthcoming years.

One of the clusters – “LiberArchitecture” – underpins the other six operational clusters: As the “environmental” cluster, it binds together what brings the other clusters to life. Whenever we are confronted with the “what’s new” question about any of the technology clusters, we find that the emergence of true open standards, the principles of service orientation and the evolution of cloud-based delivery make the difference.

The “scroll wheel” at the top of the structure contains two clusters (“You Experience” and “We Collaborate”) that consist of fast-moving, highly dynamic technologies. They have a far-reaching impact on systems, solutions and entire business models. Opportunities to differentiate, innovate and create new value are found in the outside world. This is where predefined, predictable transactions evolve into a continually shifting, collaborative ecosystem or “smart business network” of interacting players. Many paradigm-changing technologies are found here.

The middle area contains two crucial clusters (“Process-on-the-Fly” and “Thriving on Data”) that help organizations to build new capabilities in flexible business process management and deep data insight. These are the capabilities companies need in order to flourish in the “network of everything” of today and tomorrow. They make organizations quickly and correctly respond to events as they occur, creating a truly “enabled” business.

However, innovation, flexibility and insight require a proper foundation. And this is what the bottom area (with the clusters “Sector-as-a-Service” and “Invisible Infostucture”) provides in terms of technology solutions that help organizations run the non-differentiating – or commodity – part of both IT and business in a simplified, standardized way.
What is a Technology Cluster?
A technology cluster is a coarse-grained grouping of related technology building blocks to facilitate the dialogue between technology and business people.

The evolving technologies in these two clusters help companies free themselves from spending too much time and resources building and managing non-differentiating solutions. They also help to enforce business control and to comply with rules and regulations.

On the following pages, the seven technology clusters are further explained, together with a description of the building blocks that are part of each cluster and a non-exhaustive list of examples. There is also an indication of the impact that each cluster may have on selected business drivers.
You Experience
The You Experience cluster points to a new generation of user-interface technologies and devices that provide a compelling, highly individualized experience. Through these technologies, users connect freely to the network of everything to act, interact, co-create, learn and share knowledge in exactly the way that suits their needs. “You, the people” are driving this change and it is through the personalized experience that the entire value chain of technology-enabled information and collaboration is ultimately experienced.

You Experience shifts the focus of development away from monolithic solutions that are designed and built beforehand. Instead, unique, tailored applications are quickly orchestrated with fine-grained components (services) from sources both inside and outside the organization.

This cluster describes capabilities that drastically improve the way we use information systems and help us to personalize and individualize our user experience. We are all consumers who experience technology and information in compelling ways when we are at home. Innovation tends to happen there first. This “consumerization” effect creates a pent-up demand: We expect nothing less than the same experience when using business applications at the office.

User interfaces thus become richer and more powerful, even when we are using a simple Internet browser. New devices bring us simplified mini-applications that we buy from an online “app store.” They often make us forget that we are even using technology. We mix and match components from multiple sources to create our own, individualized perspective in information and the network. All in all, our perceptions of application and user interface are quickly evolving towards a new, “You Experienced” world.

Relevant Business Drivers
Business drivers taking advantage of the You Experience cluster typically deal with personalization, differentiation, customization and multi-channel strategies.
### Rich Internet Applications

Rich Internet Applications provide an attractive, comprehensive and highly interactive user experience, which goes much further than classic browser-based applications. They represent a new generation of user interfaces, integrating dynamic functionality and multi-media content.

- Microsoft’s Silverlight platform: for highly visual, media-rich browser applications
- Macromedia Flex: user experiences with the well-known “Flash” flavor
- HTML5: emerging worldwide standard that embeds “rich application” behavior

### iPodification

More and more non computer-like devices are used as the primary access channels to information and the network of everything. Building and delivering applications through these devices poses formidable challenges as old ideas and practices around the user dialogue become obsolete.

- Portable mobile devices such as the iPod Touch, Microsoft’s Zune, the iPhone, Android phones and Windows Mobile phones
- Surface computing, iPad and other tablet computers, e-books, in-car devices, game computers, interactive television and “wearable devices”

### Human Mashup Interaction

Mashup applications quickly combine services and underlying applications from potentially many sources in- or outside the organization to create composite front-end applications. Increasingly, users are able to create these mashups themselves, due to the availability of advanced mashup building tools and role-based user portals.

- Microsoft SharePoint, IBM WebSphere portal, BEA WebLogic and AquaLogic portal, SAP NetWeaver portal, Oracle Fusion Middleware portal
- Mashup platforms like IBM’s Mashup Center, Corizon’s Enterprise Mashup platform and JackBe
We Collaborate
The We Collaborate cluster describes capabilities that help organizations tap the power of internal and external collaboration. By connecting to the outside world, fixed, predefined business transactions become ongoing relationships with clients and partners — all engaged in a continual cycle of learning, collaboration, innovation and co-creation of concepts, ideas, knowledge and tangible products. This is a “mesh network of everything” in which systems and information are shared by default, and new opportunities for collaboration — sometimes ad hoc or short-lived — arise over and over again.

Organizations continually create opportunistic “business mashups” in which they draw together combinations of their own services and those of other organizations to quickly respond to opportunities, events and challenges.

Social collaboration platforms (Web 2.0) mobilize the power of the crowd in many different ways. They let communities create and share knowledge in a highly collaborative way in which interacting with others is at least as important as the actual content that is being created. Openness is the norm and sharing of knowledge is a typical cultural asset. These social networks are relevant to organizations as they provide new ways to engage with customers and potential customers. Active communities exist on the web in which consumers co-create new products with the suppliers of these products. Mobilizing the potential of so many connected, collaborating resources leads to new economic models, referred to as “wikinomics,” “crowd-sourcing” and even “social CRM.”

Increasingly, organizations dynamically connect, triggered by events in the business ecosystem and then opportunistically exchange information and synchronize services to achieve their business objectives, typically targeting growth and innovation. These “mesh business networks” extend far beyond company borders, enabling real-time, on-the-fly processes and dynamic information-exchange configuration.

In such a mesh network of everything, events and information flows occur in very high volumes and in random order. Their actual occurrences are difficult to predict, and reading and reacting becomes a truly big challenge. Evolving technologies help smart business networks to catch, monitor and interpret events and information flows that occur frequently and randomly. Complex Event Processing tools play a major role here.

Relevant Business Drivers
Business drivers taking advantage of the We Collaborate cluster typically deal with client/consumer intimacy, innovation, alliance strategies, R&D and knowledge management.
### Wikinomics

Social collaboration platforms mobilize the “power of the crowd” in many different ways. They let communities create and share knowledge in a highly collaborative way in which interacting with others is at least as important as the actual content that is being created. Wikinomics can also be applied to intimately engage and collaborate with partners in the business ecosystem.

- Wikipedia and other wiki-based collaborative authoring tools
- Social networking platforms such as LinkedIn, Facebook and Twitter
- Procter & Gamble posts problems on InnoCentive.com, offering large cash rewards to more than 90,000 “solvers” who make up a network of “backyard” scientists.

### Mesh Execution

Increasingly, organizations will dynamically connect, triggered by events in the business ecosystem. These mesh business networks extend far beyond company borders, enabling real-time, on-the-fly processes and dynamic information exchange configuration.

- WebEx business collaboration platform, which allows for opportunistic, ad hoc collaboration among business partners
- Cordys’ MashApps enables business users to glue together their own, composed processes in a visual, non-technical way.

### Smart Business Networks

Technologies that enable smart business networks help catch, monitor and interpret events and information flows that seemingly occur too frequently and too randomly to be controlled.

- Pegasystems’ SmartBPM suite supports dynamic, event-driven processes.
- Tibco BusinessEvents supports “dynamic process management.”
- IBM’s WebSphere Business Events
Process-on-the-Fly
A new wave of service-oriented solutions enables business analysts to quickly simulate, describe, model, execute and manage business processes. This provides an unprecedented capability to change and improve a Process-on-the-Fly, responding to business-critical events the moment they occur. This flexibility increases even more with the availability of business rules systems that help to isolate the policies of the organization from the supporting information systems. In addition, “composite application” platforms provide flexibility through their ability to quickly compose supporting applications from fine-grained, loosely coupled services.

Business process management pertains to the design, modeling, execution, monitoring and optimization of processes in an organization. With the new generation of business process management suites, business process management becomes an activity that can be carried out virtually in real time and in near proximity to the actual business. Also, these tools help to define and manage process in the language of the business, rather than being dependent on IT tools and programming languages. This revives a strong focus on the process dimension of organizations.

Business rules management systems – or business rules engines – enable organizations to define, manage and execute their critical business policies externally, often with a language that is much closer to business speak.

Business rules are often considered to contain the most core business practices and knowledge of an organization, even more than process logic, hence often experts speak of separating the “know from the flow.” Extracting business rules from existing legacy systems – then defining and managing them in a business rules engine or business rules management system – is a proven approach to achieve more flexibility on the business side and to have simplified, more manageable core solutions at the same time.

Relevant Business Drivers
Business drivers taking advantage of the Process-on-the-Fly cluster typically deal with frequently changing rules and regulations, risk management, mergers and acquisitions, process and quality improvement, service management and workforce evolution.
### Real-Time Business Process Management

With the new generation of Business Process Management Suites (BPMS’s), business process management becomes an activity that can be carried out virtually in real time and in near proximity to the actual business. Also, these tools help to define and manage processes in the language of the business.


### Business Rules

Business rules management systems – or business rules engines – enable organizations to define, manage and execute their critical business policies outside of classical applications, often with a language that is much closer to business speak.

- Oracle Policy Automation
- IBM’s ILIG JRules
- SAP NetWeaver Business Rules Management suite
- Pegasystems’ PegaRULES engine

### Composite Applications

Composite applications are a stepping stone on the way to a more dynamic control over business processes. Many end-to-end processes currently require interaction with different silo systems. Composite applications create an integrated environment to which changes can be applied, without intruding on the underlying systems too much.

- SAP NetWeaver Composite Application Framework (CAF) and xApps (cross-apps)
- Oracle Fusion Middleware
- IBM WebSphere BPM/SOA platform
**Thriving on Data**

Detailed insight into crucial data and events is a necessity for organizations that want to navigate a constantly changing, information-rich environment. Organizations that know how to connect the use of data to their strategic business objectives are Thriving on Data, constantly reading, analyzing and reacting to information inside and outside the company boundaries. Intelligence becomes a real-time, integrated part of whatever system or device we are using. It supports real-life decisions on the spot wherever and whenever they are needed but it also provides the deep insight to continually improve business performance and be prepared for the future. The power of data becomes even more apparent when it is made available to the outside world and leveraged there in many unexpected ways.

However, Thriving on Data requires a solid grip on the governance of data. This includes meta-definitions, ownership and synchronization. It will lead to true “mastered” data management in which advanced technology solutions and proper data stewardship go hand in hand.

Real-time, integrated Business Intelligence supports decisions on strategic, tactical and operational levels with ubiquitous insight into events and information inside and outside the organization. Intelligence is provided at the right point in time and context, often embedded in other applications. For example, the new generation of Microsoft Corporate Performance Management tools presents information integrated into Office suite applications. And SAP intelligence is likewise embedded in Outlook through the DUET service interface.

Furthermore, on the wings of the success of Web 2.0, organizations start to explore the potential of making business data freely available without restrictions from copyrights, patents or other mechanisms of control. Thus leveraging the innovative and creative powers of the community on one hand and increasing corporate transparency on the other hand. This effect becomes even stronger with the “Googlification” of data, in which structured and unstructured data – from internal and external sources – becomes available for simple, powerful search.

**Relevant Business Drivers**

More business drivers take advantage of Thriving on Data than any other cluster. Many of these aim to bring differentiation and growth potential to the market-facing parts of the organization. They also typically deal with decision making, business portfolio management, performance and risk management, client/customer intimacy, competitive analysis, knowledge management, regulatory compliance, fraud detection and, in general, control and efficiency.
### Real-Time Intelligence

Real-time, integrated business intelligence supports decisions on strategic, tactical and operational levels with ubiquitous insight into events and information inside and far outside the organization. More and more, the market-facing departments will be the main consumers of business intelligence.

- SAP Business Objects, Oracle Hyperion, IBM Cognos, SAS
- Pentaho, a leading open-source Business Intelligence platform
- Good Data, an emerging supplier of collaborative, cloud-based BI

### Advanced Analytics

Using statistical analysis in order to discover and understand historical patterns with an eye to predicting and improving business performance in the future. Analytics closely resembles statistical analysis and data mining, but tends to be based on modeling involving powerful, extensive computation.

- Cognos TM1 (financial performance analytics)
- Palantir (advanced analytics for government, security, etc.)
- Oracle CRM analytics
- SAP in-memory analytics
- IBM Entity Analytics Solutions

### Open Data

On the wings of the success of open source and Web 2.0, organizations start to explore the potential of making business data freely available without restrictions, leveraging the innovative and creative powers of the community on one hand and increasing corporate transparency on the other. This involves the use of open standards and the support of structured and unstructured search.

- Good Data (cloud-based solution to publish data and collaborate on improving it)
- Data.gov aims to increase public access to datasets generated by the executive branch of the federal government of the U.S.
- Google and Bing search engines

### Mastered Data Management

A set of processes and tools that consistently defines and manages the non-transactional data entities of an organization.

- Oracle, SAP NetWeaver and IBM InfoSphere MDM
- Microsoft SQL Server 2008 R2 Master Data Services
Sector-as-a-Service

“Commodity” business solutions are more often delivered as little-customized, package-based software. These solutions pertain to horizontal services like office automation, CRM, HRM and finance, but increasingly also to sector-specific services. This frees organizations from spending the bulk of their time, budget and resources on building and maintaining systems that do not deliver differentiating value.

Standard sector solutions will increasingly replace legacy systems, even in sectors (like public and financial services) where package-based solutions are less common. By keeping the services as close as possible to a “vanilla” standard, package-based solutions are delivered in an accelerated way, using predefined templates and deep, built-in sector knowledge.

Eventually, many of these sector services will be delivered through cloud-based infrastructures (Software-as-a-Service), simplifying the management and distribution of applications. Alternatively, legacy systems – both custom-built and package-based – may be kept, stabilized and provided with service-oriented interfaces without intruding on their inner functions and structure.

Moving to an industry-standard, packaged application with deep sector content – and refraining from intensive customization – can have a considerable impact on processes and organizational structures, as they will have to be tuned to synchronize with the application. A key message is that differentiation and flexibility are to be found in the higher layers of TechnoVision, through flexible process management, real-time intelligence, collaborative solutions and individualized user experiences. Sticking to the standard for core business services can have a healthy effect on organizations that struggle with distributed, unaligned processes and systems.

More and more application services will be delivered through the Software-as-a-Service (SaaS) cloud model, a model of software deployment where an application is hosted as a service provided to users across the Internet. The emergence of new browsers (like Google’s Chrome) that are particularly aimed at running Internet-based applications illustrates this point. More organizations will see an opportunity to strip the non-value-adding services from their IT operation and use SaaS, or even outsource the process altogether.

Relevant Business Drivers

Business drivers taking advantage of the Sector-as-a-Service cluster typically deal with mergers and acquisitions (thanks to its unifying effects), cost cutting, simplicity, efficiency, economy of scale and industrialization.
### Packaged Sector Solutions

Suppliers of package-based solutions bundle more deep sector knowledge in their products. Package-based software now even enters market sectors that historically have been dominated by bespoke solutions, such as government, banking and insurance. An alternative to packaged solutions is still “model-driven development” in which software is generated from high-level, reference business models.

- SAP or Oracle standard ERP solutions
- More specific sector solutions, for example point-of-sale systems or credit card handling
- Model-driven development, for example in the insurance industry
- Template-driven solutions, for example in the telco industry

### Software-as-a-Service

A growing number of basic application services are delivered through the Software-as-a-Service (SaaS) cloud model, a model of software deployment where an application is hosted as a service provided to users via the Internet. This may even be through “application stores” in which applications are simple, standardized commodities that can be purchased just as easily as songs or books.

- Google Apps for “horizontal” cloud applications such as e-mail, word processing, etc.
- Microsoft’s Azure, Force.com and Google’s App Engine provide platforms for cloud-based applications development and running.
- Salesforce.com is one of the premium examples of cloud-based CRM software. Its AppExchange is a typical “application store.”
- SaaS versions of ERP solutions, like SAP Business ByDesign and Oracle On Demand applications
Invisible Infostructure
Infrastructure evolves into a utility-style Invisible Infostructure, supplying all the services that an organization needs to responsibly and securely run its business on, including application, information, exchange and collaboration services and — sooner or later — core commodity business services. Organizations will liberate themselves from having to run infrastructural services such as computing, storage, networking, desktop clients, security and identity. Infostructural services increasingly will be supplied from the Internet cloud, which hides the details of suppliers, technologies and systems.

The path towards a true “on-tap” infrastructure that supports business operations must have a focus on simplicity, extreme standardization and manageability. Server, storage and desktop virtualization quickly becomes the default platform to achieve this and many organizations will consolidate (and then optimize) their existing infrastructure based on this.

This evolution of the cloud provides an important push towards achieving an Invisible Infostructure. Infrastructure-as-a-Service (IaaS) thus pertains to the delivery of computer infrastructure (typically a platform virtualization environment) as a utility service through the Internet. Rather than purchasing servers, software, data center space or network equipment, organizations buy those resources as a service from the Internet.

The huge explosion in business use of networks renders the traditional firewalled approach to securing an organization ineffective. Information flows between organizations over open networks, so that ultimately the only reliable security strategy is to protect the information itself, rather than the network and the IT infrastructure. This trend is called de-perimeterization or “Jericho-style” security.

External events are brought into the infostructure through sensing networks (RFID, GPS, etc.). These networks link the “Internet of things” to the organization, building on the fact that processors are becoming so cheap that they can literally be built into anything.

Relevant Business Drivers
Business drivers taking advantage of the Invisible Infostructure cluster typically deal with cost cutting, fighting complexity, increasing effectiveness and corporate responsibility.
### Utility Business Infrastructure

Virtualization is the powerful key to reducing the number of servers and storage units, thus decreasing complexity and power consumption.

Service management platforms provide the tools to manage all components of an infostructure as standardized services, which can be defined, executed, monitored and managed.

Service-Oriented Architecture (SOA) integration platforms are used to support all aspects of information capturing, storage, processing and exchange across the network.

The use of cloud-based infostructure will increase.

- VMWare, Citrix (XENServer, based on the open-source product XEN), Microsoft (Windows Server 2008 Hyper-V)
- IBM Tivoli Process Management, HP SOA Manager, Software AG
- IBM, Microsoft, Oracle, Software AG, SAP
- Amazon, Rackspace, EMC2, Google, Microsoft, HP

### Jericho -Style Security

Every information component protects itself, without relying on the corporate “perimeter” or firewall. Also known as “de-perimeterized” security.

- Digital Rights Management, encryption, authentication and identity management solutions from several specialized suppliers

### Sensing Networks

The “Internet of things” applies various sensor technologies (including location-based technology) to connect devices in a highly interactive, context-sensitive mode.

- GPS, RFID and many other sensor technologies to monitor light, pressure, movement, temperature, etc.
**LiberArchitecture**

This seventh cluster contains the enabling principles that underpin the other technology clusters. It is a “virtual” cluster in the sense that it is not likely to be used as direct solutions. Instead, it describes the elements of an architectural approach to take full advantage of the emerging technologies in the other clusters; we consider these elements throughout our work with the six other clusters. Also, this cluster tends to answer the “what’s different” question. Whenever we ask ourselves what the changes are in creating solutions for infrastructure, core applications, business intelligence, process management, collaboration and user interface design, we find that crucial advances are made in:

- Open standards
- Service orientation
- The cloud

Applying the elements of LiberArchitecture creates the level of freedom that we describe in TechnoVision, not only in opening up our systems and information flows to the outside world, but also in liberating ourselves from the inflexible solutions of the past. This is an architecture that truly supports freedom, boundaryless information flow and collaboration, hence the concept of LiberArchitecture.

**Speaking the Same Language**

Open Standards are an important part of LiberArchitecture, because organizations can only collaborate effectively and achieve a boundaryless information flow if they speak the same, widely accepted and recognized language. Proprietary standards – even when solid and established – fail when more parties are involved; therefore the only way forward for organizations is to adopt global, open standards.

Open standards do not pertain only to horizontal, infrastructural standards (like the well-known and now quickly stabilizing stack of XML/SOA standards for exchanging information through web services, and Open Document Format for the exchange and storage of office documents). They also address vertical market- and industry-specific requirements for information exchange and collaboration.
Open standardization is also crucial in the area of shared methodologies, frameworks, tools and even certification of skills and competencies, as it is often the human factor that eventually decides the success of collaboration.

Unifying Business Processes
As a ubiquitous design principle, service orientation itself is only enabled through widely accepted, open standards. Service orientation is an architectural style in which existing or new functionalities are grouped into atomic services. These services communicate with each other by passing data from one service to another, or by coordinating an activity between services.

A flexible, standardized architecture is required to support the connection of various applications and the sharing of data, as described in this TechnoVision. SOA unifies business processes by structuring large applications as an ad hoc collection of smaller modules called services. These applications can be used by different groups of people both inside and outside the company, and new applications built from a mix of services from the global pool exhibit greater flexibility and uniformity.

An Ideal End State
Building further on the concepts of open standards and SOA, the Cloud illustrates an ideal end state of evolving technology, as it maintains all the advantages of a solution without suffering from any of the disadvantages.

After all, cloud computing is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the “cloud” that supports them. The cloud extends to infrastructural services but also to applications and the platform facilities to build and run cloud-based applications.

The cloud provides all the services that are needed, yet with the lightest footprint possible and without uncovering any of the implementation details. Throughout the clusters of TechnoVision, we find that “cloud-think” provides an additional dimension that further enhances the level of freedom in the solutions that are chosen, both in terms of cost control but also in terms of manageability and flexibility (moving from fixed costs to usage-based costs).

LiberArchitecture, the freedom-creating environmental cluster, enables the evolution of the six operational clusters and their harmonious interactions.
When the representative of a business driver meets the representative of a technology cluster, what do they discuss? Clearly not the weather. Clearly not generalities.

The business side announces its needs: “If I truly want to fix our service issue, I need to equip our people in the field with mobile technology, some form of tablet computer. But we have a big security issue; we need to give them all the details on our products including the software that supports them! Without good security, no way can we do it.”

The technology side advertises the capabilities of their cluster: “With the recent developments in Invisible Infostructure, we can offer a security solution that will be wrapped around each of your downloads in the field, thanks to the building block called Jericho-style security. Here is how it works…”

And so the dialogue continues, up to its conclusion. Business: “I do need your solution for my driver. When can we include it in our project?” Technology: “It will be our first implementation of this pretty new technology. Better to start with a pilot. Let’s create a joint team and install this pilot in the next couple of months. Based on the learnings, we can expand it to your whole driver.” And so they agree on the right actions.

During this dialogue, two things happen.

1. The Agora is where people understand each other. Drivers are defined concretely – there is no doubt as to what is needed. Technology, thanks to the crisp definitions and unambiguous language of building blocks and clusters, becomes meaningful.

2. Business and technology are no longer separate fields, enclosed behind high walls. The business solution is technology-based, the technology finds its meaning in the business need. Once separate, they become like the fingers in one hand, or the two legs needed to win the competitive race – or even the two sides of a Moebius strip – it has only one!

As a result, business and technology become Business Technology. And the Capgemini Agora is justifiably called the BusinessTechnology Agora.
Creating the Full Picture
On the Agora, each business driver representative speaks with each technology cluster representative. From their dialogues will emerge a complete picture of the relationships between drivers and clusters.

Let’s first summarize each conversation: Either the cluster is a “must” for the business driver, or it is not. And the cluster can be put to work now if the technology and the capability to use it are available, or only later.

Let’s then build a matrix with the business drivers as rows and the clusters as columns. The cells summarize the dialogues as indicated above. “M” will indicate the must correlation, and color dots will show the timing: green for right now, yellow within six months (for example), red for later.

Here is the resulting matrix:

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**TechnoVision Matrix**
What does the matrix tell us? How can we read it, to draw conclusions in the form of actions – beyond the ones resulting from the individual dialogue?

Like every matrix, this one lends itself to vertical and horizontal reading.

Looking at one of the rows, we can count the must relationships and draw conclusions about the driver itself, its feasibility, its timing, the organization of the project, the level of technical orientation.

Looking at one of the columns, we can count the must relationships (instances where the technology cluster is a must to address the business driver), and draw conclusions on resources, organization, priorities. Timing considerations will show how quickly cluster actions need to be taken.

Looking across drivers, one can judge if they give the right picture of the ambitions of management, if the priorities are correct, if the executive plate is too full.

Looking across the clusters, one can see priorities in Business Technology, the weight of infrastructure and ERP developments, compared with the drive for innovation at the user and social network level (the green clusters). One can also evaluate the role of data in the company projects or determine if the organization will become more agile thanks to Process-on-the-Fly.

From a distance, the matrix can deliver critical indications on the “technology density” of the organization or its strategic balance.

Let’s now look at the various kinds of actions that can be derived from each of these views.

The TechnoVision matrix is the map of business and technology relationships.
**Business Driver Actions**
The actions for a given business driver derive from the sum of the correlations with the technology clusters.

With two or more musts, the driver shows a level of Business Technology dependency that calls for a full understanding of the way it is managed: Is the integration with technology good enough? Is the project design balancing business and technology in the right way? If one cluster is not available now and requires a circumvention solution, is the overall design still correct or should the driver be split into two more easily managed projects?

**Example:** A business driver with complex technology dependencies relates to the IT department through a single person at a junior level. Is this sufficient?

If the driver shows no dependency on evolving technologies (an increasingly rare case), this raises a very different set of questions: How could the driver better serve the purposes of the business with a better use of technology? Has the driver been developed with a sufficient understanding of the technology’s potential?

**Example:** This driver includes a substantial redefinition of the role of the sales force. It does not include new mobility solutions. Can this be right?

The Business Technology dialogues of the Agora often shed a new light on the driver itself – independently of technology. Some of them will appear overly timid. Others overly ambitious. Or too difficult to manage. They will have to be redefined or redesigned.

Some business drivers, typically one or two out of five or six, are so critical or challenging that they call for different management than the daily lot of executives. They are too strategic to be managed operationally, too multi-faceted to be managed as separate projects. They call for the management tools and techniques of business transformation endeavors.

**Business driver actions result from technology considerations, or from other Agora-generated insights.**
Technology Cluster Actions
For each of the clusters, the actions are the result of how often, and when, this technology is needed to implement the business drivers.

You Experience and We Collaborate
Taken together, these clusters accumulate an impressive number of musts. While the technology itself is usually seen as suitable, the capabilities’ depth and firepower are not sufficient to serve the sum of the business drivers’ needs. This triggers build-up and pilot actions.

Process-on-the-Fly
The Process-on-the-Fly cluster is often acknowledged as being an important part of the solution, but the technology is pretty new and therefore little known, and it scores low in terms of most companies’ capabilities. However, the developments go fast and tooling progresses rapidly. The changes that need to take place are at the heart of the systems, and it feels like open-heart surgery. Experiments and pilots will be needed.

Thriving on Data
This cluster is the key to many drivers, but typically the technology is ahead of the organization’s capabilities. Most organizations know they can and need to do better on this, and there is little that stands in the way of doing so. Thriving on Data is quite directly linked to Business Intelligence (BI) and content management capabilities, even though the mastered data management topic is also closely linked with the different ERP solutions. Organizational and staffing actions are frequent.

Sector-as-a-Service
This is typically an area where a lot of investments – primarily in ERPs – have already been made, and it is sometimes not clear what needs to happen next. The detailed analysis of the matrix often shows that the basic services need redesign to release the full potential of the Process-on-the-Fly and Thriving on Data clusters.

Invisible Infostructure
The Invisible Infostructure is also well represented in most matrices, as companies understand that they need to improve in the area of connectivity and security. Detailed studies are required to define actions with the right balance of innovation and continuity of operations.

Technology actions cover a wide range – from sourcing and training to organization via experimentations and pilots.
On the BusinessTechnology Agora, the technology magnifying glass shows the business landscape with a new level of accuracy.

**Looking Across Drivers**

On the Agora, the discussions with technology representatives go well beyond technology and the individual business driver. It is as if the technology magnifying glass shows the business landscape with a new level of accuracy, and provides new angles of observation, judgment and action.

**Example:** Is the organization leveraging technology powerfully enough, especially when compared with its competitors?

**Example:** Are the new ways of supplying, servicing and dealing with customers in tune with our networked society?

**Example:** The list of drivers, thoroughly discussed on the Agora, needs to be pared down and phased over 24 months rather than 18 months.

Looking at the matrix from a distance, a company’s top management can raise questions worthy of their level and commission the corresponding work: Is the strategy, as reflected by the drivers, adequate? Is the governance of the drivers strong enough? Are the executive roles well distributed? Is our level of investment adequate? How can we accelerate our modernization?
Looking across clusters, the CIO can set up a basis and direction for a company’s Business Technology strategy.

**Looking Across Clusters**
The TechnoVision matrix provides an accurate picture of what Business Technology’s program has to be – defined by business and technology representatives working hand in hand, brain in brain. Looking across the clusters is but the first way to translate this program into the right strategy for execution – a major step towards a proper Business Technology strategy.

The Chief Information Officer will be able to further study and draw conclusions, notably in terms of:

- **Organization**: Does the present set-up deal adequately with the technology clusters? Is it Business Technology-ready?

- **Priorities**: Which clusters deserve the highest priority, which ones should be put on the back burner? Where should the high-level resources focus?

- **Innovation management**: Where do we need to launch experiments – to learn about the new technology capabilities? Or tests, to verify their fit with the business ambitions?

- **Resource deployment**: Can we cope with the musts of the drivers? Should we move resources from the blue clusters towards the green ones? Should we recruit new people for some of the more advanced building blocks?

- **Capability development**: Are the training programs adequate? How do we acquire the new capabilities in due time?
Towards Business Technology

We need to move towards Business Technology because, after their wedding, business and technology are no longer the same.

From Information Technology to Business Technology. So what? What is the big deal?

The big deal is that, after its wedding with technology, business is no longer the same.

It will take years to fully understand the consequences, and even longer to see them fully deployed. Technology changes every aspect of the enterprise – from strategic planning to budgeting, from structures to processes, from client, customer and partner relations to the supply chain, from R&D to market innovation, from offerings to services, from people management to facilities.

The big deal is that, after its wedding with business, technology is no longer the same.

As technology’s role is different, its people need to be different – the systems architect must understand the business in depth. As its role is different, its capabilities need to be different – to serve both the foundations of the organization and its needs for high market reactivity. As its role is different, its management needs to be different – to reflect the new services orientation, services to business and services to clients.

With so much to do, how should we proceed? Let’s share a selection of the dominant themes in our experiences to date, discuss how to start and how Capgemini can provide support.
Our Experiences to Date

During the great recession, it was difficult for the IT function in many organizations to focus on more than reducing the unit cost of delivering Information Technology itself. Often there were only a few cycles left to assess the possibilities of using technology to reduce costs in the business or optimize business outcomes. Short-term considerations often had to prevail.

Reducing the unit costs of IT will always remain important and the opportunities for industrialization of the delivery by proper lifecycle management, open standardization, platform rationalization and virtualization into a private cloud have by far not been exhausted. The wave of industrialization is focused precisely on this. We need “radical simplification” with innovations in how we manage applications over their lifecycle (we call it Application Lifecycle Services), the way we migrate IT landscapes from one phase to another (Controlled Migration), or the way we improve the quality of the application portfolio with, for instance, Managed Testing Services.

Nevertheless, it is becoming important now to leave the crisis in the dust and move on. Again, the question comes to the forefront: How can we leverage technology to really innovate and improve the business, create new business processes or even complete new lines of business?

Innovation Themes on the Agora

Earlier we referenced the intertwining of business and technology, which one can compare with the sides of a Moebius strip that make up a single surface. To win in the innovation marathon, we must look at both sides, virtually at the same time. Business Technology supports business innovation, but at the same time it generates and inspires business innovation.

So what are the recurrent conversations and dominant themes on the Agora today as organizations start to look further again – beyond their traditional investment areas like ERP?

Here are four examples of major innovation spaces:

1. Mastering the skill of deriving information and insight out of the vast ocean of internal and external data. Significant investments are being prepared and made in improving the analytical capabilities of the organization, the way it manages structured information and unstructured enterprise content. Often a factory environment is created to handle all the emerging requests, equipped with the proper staffing and tooling. Business Information Management is a hot topic on the Agora.

2. Improvement of the electronic access of the organization to and from the outside world, and of its ability to interact and collaborate in a dynamic ecosystem. In short, improving the “web presence” of an organization, making
full use of the Cloud. This now becomes a priority for many organizations in almost any sector, private as well as public.

The portal needs to be firmly integrated with the information hidden in the operational systems of the organization. Consumers and citizens want access to real up-to-date information about their specific and individual case, for example, an allowance or tax credit or a consignment status.

Also, they want it at the moment and on the device they choose, leading to new ways of access computing. Being present as an organization via as many channels and in as many mash-up environments as possible becomes an essential survival skill. The cloud becomes the place to be in order to win the differentiation sprint.

4. The way we organize work for our employees will significantly change.
It’s a new era, where elements like work-life balance, flexible timing and flexible capacities, plus congestion that often limits access to the traditional office space force a “new way of working.” A mix of technology clusters enables and creates a different office and working environment. Flexible workspaces, digital workflows and unified communications are changing the way we think about and organize our work. By doing so, organizations can become better and more attractive employers making optimal use of scarce talent.

3. The need for more organizational flexibility and process agility. Certainly for large administrative organizations, like government or insurance companies, a breakthrough has taken place. A potent mix of tools in areas like business process modeling and management, business rules engines, case management and workflow management drives unprecedented levels of adaptability to the new and ever-changing rules. This creates the ability to translate and apply those rules consistently in the millions of individual cases these organizations need to handle.

After dealing with the downturn, we need to look at Business Technology to enable innovation as well as to help create and inspire innovations. Never before has technology been so important not only in winning the efficiency race but in winning the growth race. For many organizations, the BusinessTechnology Agora has become an essential Petri dish of innovation.
Declare Business Technology to be the way the organization will look at the combination of business and technology.

**How to Start the Journey?**

A full implementation of the Business Technology thinking will take time. The longer the journey, the earlier one should start – but how?

The **first step** is to declare Business Technology to be the way the organization will look at the combination of business and technology. Change the name from Information Technology and explain why you changed it.

The **second step** is to create the conditions favoring the dialogue, or rather the dialogues, between business and technology. Having an Agora is a must, building the institution will send a powerful signal. All the more so as the Agora, once built, once used, can and should be put to work multiple times: repeating the dialogue, but also changing the Agora topic – taking a functional view, on marketing and sales for example, or focusing on a broad, complex enterprise ambition like “Creating a new customer experience.”

The **third step** is to deal with the business drivers as the tools to manage the evolution of the business. By designing them together, business and technology people will not only identify dependencies on technology earlier, but also make the design of the driver project stronger thanks to technology opportunities.

If joint work has started at the design phase of the drivers, it will naturally continue in their implementation. “Joint ventures” between business and technology will be seen as the best way to progress, for example to jointly manage the deluge of marketing data – paving the way for more Business Technology initiatives.

**Other steps** of course vary. For example, when the time comes to budget, why not look at the investments in business and the investments in technology at the same time, in the same overall perspective?

And when it is time to discuss strategy, use the Agora for that purpose – Business Technology will then be yours, a key competitive advantage.
Simple in principle, the Business Technology Agora works best when well prepared and built and used carefully.

Capgemini’s Support: Building YOUR Agora
The Agora is a simple concept. Maybe deceptively simple: Building it, using it, taking full advantage of the matrices requires know-how, a know-how Capgemini as the creator of the Agora is developing daily. Beyond the general concepts, five areas of experience are critical.

1. The technology clusters need to be understood in depth. Often, the critical element to the business is not the cluster in general, not even one of its building blocks, but only one component of that building block. Furthermore, the representatives of technology on the Agora have to see the path between today – the state-of-the-art in the enterprise – and tomorrow – where technology will lead us in a couple of years.

2. Business drivers are not a matter of course. For some executives, it is a natural way of thinking. For others, it requires inquiry and translation – a process that brings benefits in itself. Not only is the work on the drivers the occasion to clarify and streamline what the executives want to do, it is also a first opportunity to enrich the thinking: with memory banks of existing drivers, and with ideas and references from other sectors of industry.

3. The Agora dialogues need facilitation. Business and technology representatives benefit from the support of a third party with previous experience, from questions putting a new light on their undertaking, and sometimes from a friendly arbitration.

4. The TechnoVision matrix, produced on the Agora, is a picture in need of an interpretation. Experience helps draw the right conclusions. Comparisons with other matrices produces major additional insights.

5. Insights will be of interest, but relevant only when translated into the right actions. This might well be the most critical step on the Agora, or after it. Some are obvious – for example the redeployment of resources across the technology clusters. Others get to the heart of the organization: Doesn’t the sum of the business drivers represent the future of the enterprise?

At Capgemini, we are eager to help you move faster towards Business Technology.
Conclusion

Working or playing on our laptop (or netbook or hyperphone), one feels technology’s movement – alone or in our networks. Innovation flows, every day, in the “green clusters.” Less visibly, but as importantly, the “blue clusters” change at a speed that one never associated with platforms or infrastructures – under the big umbrella of the cloud. Technology reshapes even the staid processes of all organizations – the “yellow cluster” fulfilling the adaptive dream, on-the-fly. All of that in the middle of a hopeful race to cope with the new waves of data and information – the “orange cluster” recasting our relation to the world.

Having changed our lives, technology is bound to change, over and over, the lives of our enterprises and public services. To cope with it the old way – the way Information Technology has developed over 50 years – would be absurd. We need to invent new ways to bind business and technology.

Capgemini proposes its BusinessTechnology Agora as the tool to understand, illustrate, architect and reach this new world. We hope this booklet gives you a taste of – and for – it, and whets your appetite to get there. We will do our best to help you on the way.

Capgemini’s BusinessTechnology Agora is the tool helping businesses and organizations reach a new level of development.
About Capgemini and the Collaborative Business Experience

Capgemini, one of the world’s foremost providers of consulting, technology and outsourcing services, enables its clients to transform and perform through technologies. Capgemini provides its clients with insights and capabilities that boost their freedom to achieve superior results through a unique way of working, the Collaborative Business Experience™. The Group relies on its global delivery model called Rightshore®, which aims to get the right balance of the best talent from multiple locations, working as one team to create and deliver the optimum solution for clients. Present in more than 30 countries, Capgemini reported 2009 global revenues of EUR 8.4 billion and employs 90,000 people worldwide. More information is available at www.capgemini.com

For more information on Building the BusinessTechnology Agora with Capgemini’s TechnoVision, please contact:

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