White Paper

Workstyle Innovation

A Proven Methodology for Productivity Improvement and Organizational Effectiveness

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September 2012

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Executive Summary: Focus on Customer Value

This paper describes a proven methodology to accelerate business innovation and achieve dramatic productivity improvements through a structured, innovative workstyle. Cisco's Internet Business Solutions Group (IBSG) has developed this methodology in engagements with leading global companies. These companies have realized significant productivity improvements when the principles described here have been applied to groups and individuals who do intellectual work, including customer management, business strategy, research, product/service development, manufacturing engineering, supply chain, quality management, facility management, and other staff functions.

The methodology is built on the principle that customers will pay for what they value. Today, many companies assume that customers will buy a product just because it is of high quality, or that employees should work on projects just because they have been requested to do the work. Instead, we suggest that every business process be examined in light of the customer viewpoint. Does a product have features and capabilities that customers want, and for which they are willing to pay? Do business processes and administrative activities contribute to factors that customer value?

The principles described in this paper are designed to help knowledge workers sense and evaluate the competitive and business environment, make intelligent decisions, and focus their efforts on activities that will create the greatest value for customers. This, in turn, will improve the company's competitive position.

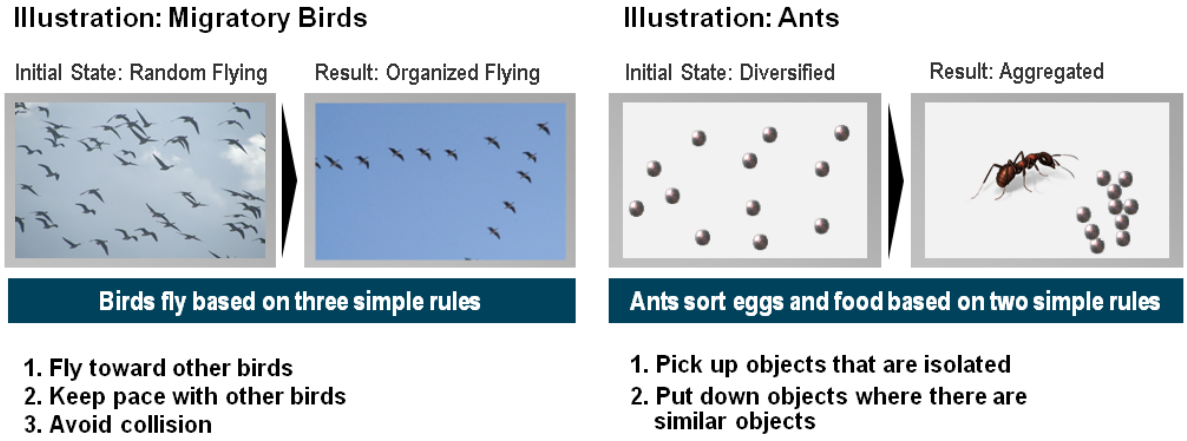
Principles of This Methodology

The methodology introduced in this document empowers employees to take autonomous action to improve productivity and create customer value—a process we call "workstyle innovation." By applying the techniques described below, team members will be able to identify improvement opportunities and take individual action to improve innovation and productivity. The team monitors progress based on ongoing benchmarking. The result of this process will be not only a more productive and innovative organization, but also more satisfied and engaged employees who can see the impact of their own efforts.

Promoting Autonomous Activity for Workstyle Innovation

The aim of the methodology is to promote autonomous activity by individual knowledge workers based on an unflinching commitment to the customer viewpoint. The mechanism we employ here is the same as that seen in groups of migratory birds[1] and in ant colonies.[2] In the examples shown in Figure 1, individual entities act autonomously based on a simple rule or guiding principle. The result is a remarkably organized and efficient society that adapts quickly to a dynamically changing environment.

Figure 1. Rules of Nature.



Source: C. W. Reynolds, 1987; J. L. Deneubourg, et. al., 1990

A Simple Rule for Productivity Improvement

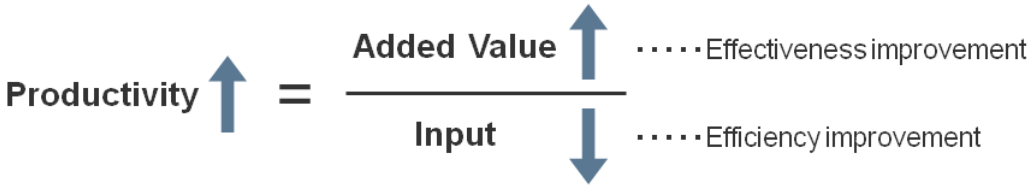
For enterprises today, the analogous guiding principle is customer value. We can determine the value of a work activity by simply looking at the customer's willingness to pay for it. When work is strongly requested by customers, we need to sense the core need behind the request, and try to deliver the exact value the customer wants. If a work process is not valued by customers, we should remove as much of that activity as possible from the business.

Even in a rapidly changing world, companies can rely on this simple rule to direct decision-making processes and help them adapt to changing conditions. Global enterprises that have adopted this methodology through engagements with Cisco® IBSG have achieved dramatically improved productivity and employee satisfaction.[3]

Productivity Improvement Is the CEO Agenda

Improving organizational productivity[4] is one of the most critical objectives for both CEOs and public sector leaders. As shown in Figure 2, productivity improvement is a function of improvements in both efficiency and effectiveness.

Figure 2. Productivity Improvement Means Creating Maximum Value Using Minimum Input.



Source: Cisco IBSG, 2012

To improve *effectiveness*, companies must add greater value to their products or services. Effectiveness is about adding maximum value using a given amount of input. (In the case of knowledge workers, input would be work hours.) A highly effective organization can sense market transitions and respond promptly to changing customer requirements. On the other hand, *efficiency* is about producing a certain amount of added value using the least possible

input, or work hours. Highly efficient organizations reduce or eliminate the non-value-added activities of daily operations. Though these measures may seem to contradict each other, only by analyzing and improving *both* effectiveness and efficiency can organizations make significant improvements in productivity.

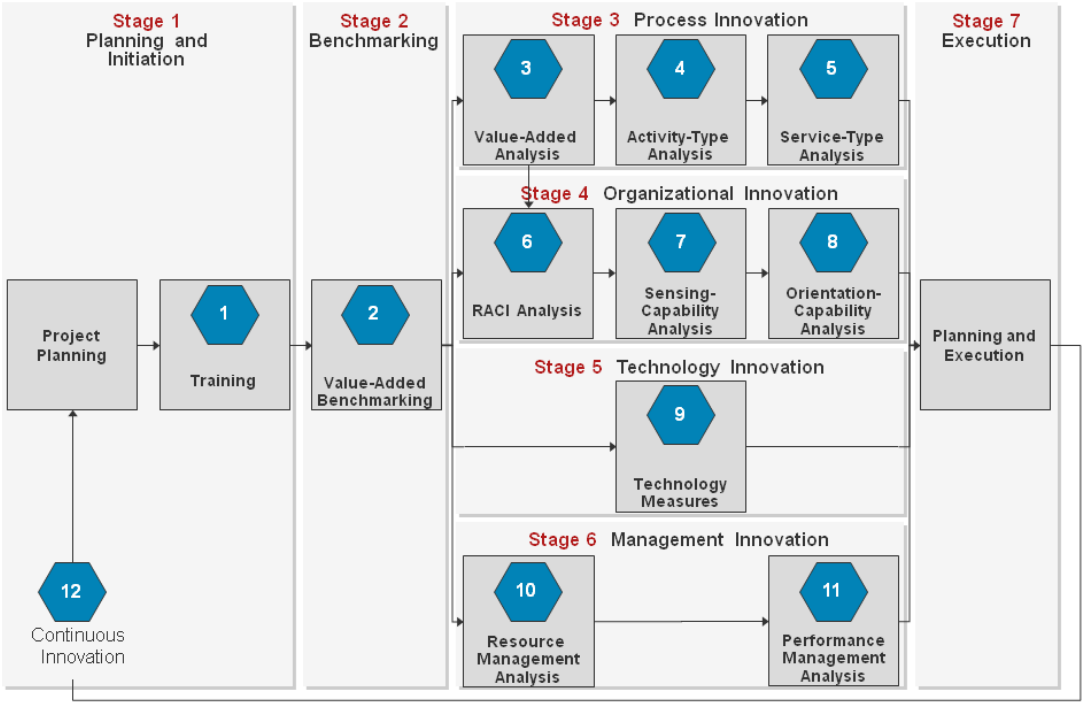
To begin a journey of continuous improvement, enterprises need to identify and analyze the size of opportunities for improving productivity within the organization. They then should undertake the structured process described in the next section for workstyle innovation. Once the team has done what it can to remove inefficient business processes and working patterns, they can find where information and communications technology (ICT) can deliver additional improvements, particularly in the area of collaboration. Enterprises can ensure a higher return on their ICT investments by executing productivity-improvement measures *before* implementing the ICT tools. Unless inefficiencies are removed before technology implementation, advanced tools may conceal organization-wide inefficiencies.

Using this workstyle-innovation methodology can help organizations determine which investments in time and technology can have immediate impact. Over time, they will be able to control and adjust these measures to optimize long-term implementation.

Twelve Action Items of this Methodology

Cisco IBSG has identified 12 actions organizations need to undertake in the process of workstyle innovation to improve productivity (see Figure 3.).

Figure 3. Workstyle-Innovation Methodology Overview: 12 Action Items in 7 Stages.



Source: Cisco IBSG, 2012

Action Item 1: Training

After project planning, workstyle-innovation activities must begin with training so that participants understand the process of productivity improvement and are empowered to act on their own, based on the simple rule of customer value.

Action Item 2: Value-Added Benchmarking

The next activity is benchmarking to evaluate the current environment. It is critical that the direction presented by the management team aligns with the activities executed by employees. The tool of benchmarking enables both parties to have an accurate picture of the current status and to come to a common understanding about where to go next. Benchmarking uses indisputable facts based on numbers. A quantitative assessment is a core component of this methodology, and is especially helpful in establishing cooperative attitudes between management and employees.

Based on benchmarking, there will be a workshop to identify workstyle-innovation opportunities and decide on an action plan. During this session, breakout teams analyze the current environment, identify improvement opportunities, and plan implementation activities.

The following sections introduce the methodology for current environment analysis and identification of improvement opportunities.

Action Item 3: Value-Added Analysis

Every business process is done for an explicit or an assumed customer, and can be sorted into one of two types: value-added activities (VA) or non-value-added activities (NVA). *Non-value added activities* do not produce value from the customer viewpoint. They can be categorized using the following five factors:

- **Preparation:** Work that is done while preparing for another task, such as making documents for a periodic meeting.
- **Move:** Time spent moving physically from one place to another (for example, driving to another building to attend a meeting).
- **Queue:** Time spent waiting for one process to finish before being able to move on to the next action.
- **Inspection:** Time spent reviewing and approving a work product.
- **Redundant:** Repetitive, similar processes and redundant processes.

All non-value-added activities are categorized using these five factors, without exception. Priority should be given to eliminating these NVA business processes.

Value-added activities are classified into following two categories:

- **Customer value-added activities (CVA):** Business processes for which a customer would be willing to pay an appropriate cost.
- **Business value-added activities (BVA):** Business processes that are mandatory in order to assure regulatory compliance and corporate social responsibility.

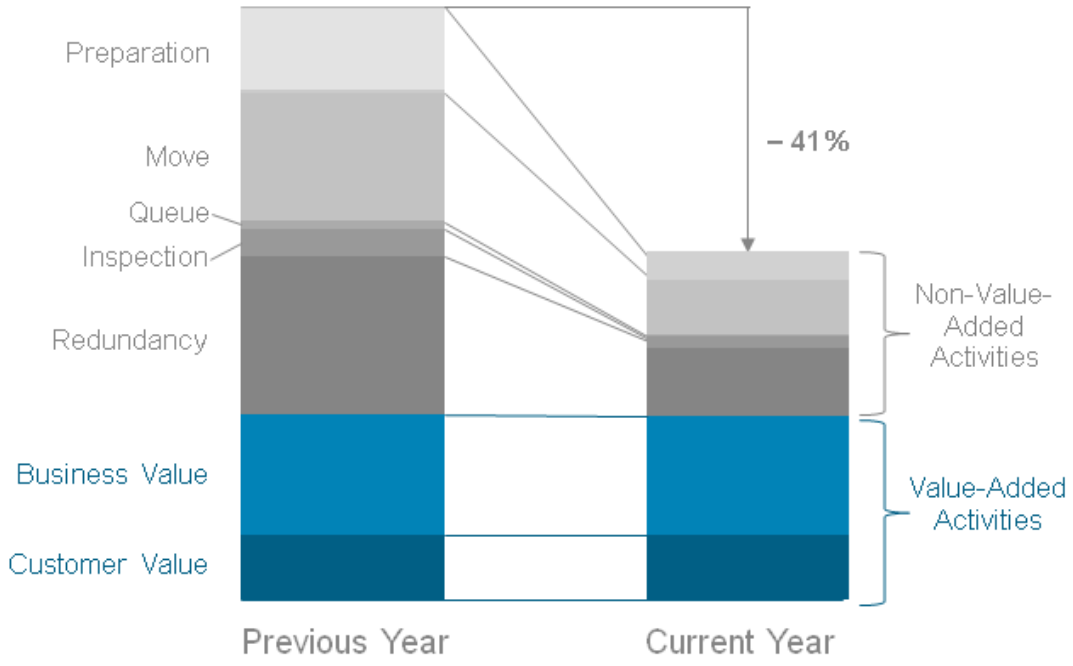
The team should look at how to reinforce these value-added processes to increase revenue and competitive advantage, or to improve efficiencies.

Examples of Productivity Improvements

Based on Cisco IBSG consulting experiences, non-value-added activities tend to represent 70 to 80 percent of total hours, at least half of which could be eliminated. After applying the workstyle-innovation methodology, almost all of the organizations with which we worked achieved a 35 to 40 percent reduction of total hours in one to three years. Additionally, some companies increased their output by 10 percent or more. Applying the definition of productivity improvement in Figure 2, if we divide 110 percent of value by 60 to 65 percent of input, the result is productivity improvements of 70 to 80 percent.

In the current worldwide economic turmoil, this magnitude of productivity improvement could make a significant impact on corporate performance and health.

Figure 4. Illustrative Case of Workload Reduction: Impact of Implementing Productivity-Improvement Measures.



Source: Cisco IBSG, 2012

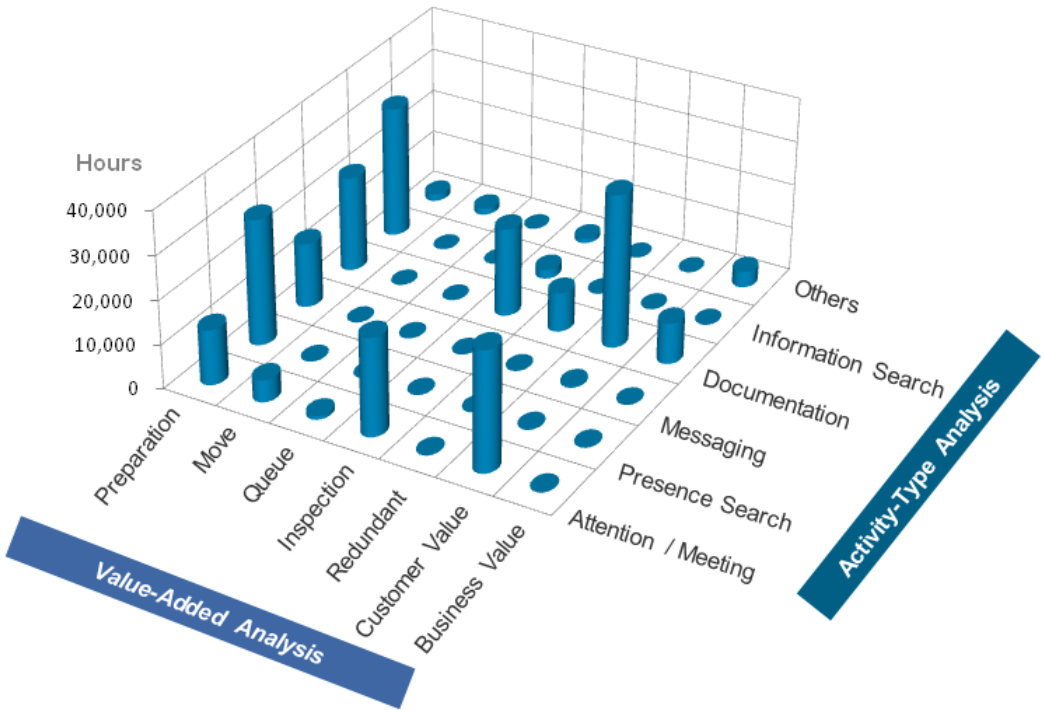
Action Item 4: Activity-Type Analysis

In addition to classifying by value-added criteria, we can analyze the same business processes by activity type, or mode of work. This activity-type analysis will lead to another set of improvement measures, including technology implementation, which will be introduced in action item 9 of this methodology. Activity-type analysis has the following six categories:

1. **Attention/meeting:** Time spent in collaborative work. Meetings may be held for decision making, cascading information, and/or team building. Meetings may be held using telephone, web conference, telepresence, or other collaboration technology, in addition to face-to-face gatherings.
2. **Presence search:** Time spent identifying and locating a required person using a directory, scheduler, presence search tool, or other means.
3. **Messaging:** Communication by email, instant messaging, or other electronic media. If a meeting is not needed for collaboration and decision making, we may use email, voicemail, podcasts, and other messaging tools to send texts, voice, or video messages to share information for decision making, cascading, and/or team building.
4. **Documentation and storing:** In order to share and retain data or knowledge, we develop and store documents, videos, and training materials. Wikis, online communities, net storage services, and e-learning are examples of tools used.
5. **Information search:** For documentation, messaging, and decision making, we need to search for and gather relevant information using knowledge databases, business intelligence, market intelligence, search engines, and other tools.
6. **Others:** Other activities include thinking, reading, and other activity types that are not categorized above.

Based on this analysis, we will focus on business processes that consume too many hours in each category and look for ways to optimize them.

Figure 5. Illustrative Value-Added Analysis and Activity-Type Analysis.



Source: Cisco IBSG, 2012

Figure 5 illustrates the relationship between value-added and activity-type analysis, assessing the total accumulated work hours consumed by each activity in the target organization within a given period of time (month, quarter, or fiscal year, for example). Value-added analysis indicates hours consumed by value-added and non-value-added activities. Looking at each type of activity, we try to identify the non-value-added activities that could be reduced or eliminated. For instance, a significant amount of time in attention/meeting activities is spent on preparation and inspection. To improve productivity, we can first eliminate the non-value-added meeting time, and then look for ways to improve value-added meetings using collaboration technologies, for example. If we look at messaging, almost all of the hours are consumed by preparation, a non-value-added activity. To improve productivity, we should consider eliminating emails and other messages that are not required by the recipients at the time they are sent. In this case, web conferencing, file sharing, and other technologies may be useful tools.

Action Item 5: Service-Type Analysis

After implementing improvement measures based on the value-added and activity-type analyses, service-type analysis can accelerate process transformation. By analyzing the business process characteristics, we can apply the following seven service types:

- **Automated services:** Automation of business processes
- **Self-service:** Interactive processing by end user
- **Shared services:** Aggregation of business processes
- **Outsourced services:** Outsourcing or out-tasking of business processes
- **Offshored services:** Offshoring of business processes
- **Event-based services:** Rules-based control of irregular events
- **Mobile work services:** Mobile technology-enabled telework

These seven service types constitute the best practices for improving productivity and transforming an organization's workstyle. All business processes should be examined to see whether one or more of these seven service types can be applied.

Action Item 6: Organizational Redesign by RACI Analysis

After conducting the above three-pronged analysis of business processes, we turn our attention to the organization itself. The first step in the organizational analysis is to evaluate roles, responsibilities, and process flow using the popular RACI (responsible, accountable, consulted, and informed) analysis method.[5] By applying RACI criteria, we can clarify who is doing what in an organization, and can identify and redefine workload, empowerment, and conflict among responsible individuals. This tool will shed light on inherent organizational issues that inhibit clear and effective decision making, and can help participants consider measures to correct imbalances by realigning the organizational structure.

Introduction to Action Items 7 and 8: Organizational Capability Enhancement

In recent years, managerial focus has moved from unit-cost reduction of products and services to unit-cost reduction related to human resources, especially of knowledge workers. For this purpose, many companies have embraced a traditional knowledge-management framework (shown in Quadrant I of Figure 6, next page), which enables organizational learning and reuse of knowledge and experience.

However, the traditional knowledge-management framework may not offer enough options to help organizations adapt rapidly to today's changing and diverse market. The source of today's competitive advantage isn't solely in reuse of past insights supported by knowledge management.

In a dynamically changing market, innovation is key—both for creating and developing new markets, and for adapting operations to new market conditions. To help companies compete and win in transitioning markets, Cisco IBSG engagements have employed the "OODA loop,"[6] an effective tool that uses *observation, orientation, decision making,* and *action* to focus innovation and bring about organizational capability transformation.

Organizations need to sense tidal changes from the subtle movements of markets, regulatory requirements, and technology. They then need to quickly adapt to those changes by aligning the right skills and talents with the new market requirements for creating customer value. For both sensing situations and aligning talents and skills to create value, we need a certain managerial framework.

The organizational capability managerial framework, shown in Figure 6, has been developed based on the OODA loop in addition to the principles of knowledge management. Observation, or "sense making," is the first activity process. Observation and sensing are composed of internal sensing and environmental sensing. Internal sensing focuses on internal factors such as process and performance. Environmental sensing looks externally to sense transitions in markets, customers, partners, competitors, and other outside stakeholders and objects, in addition to sensing internally.

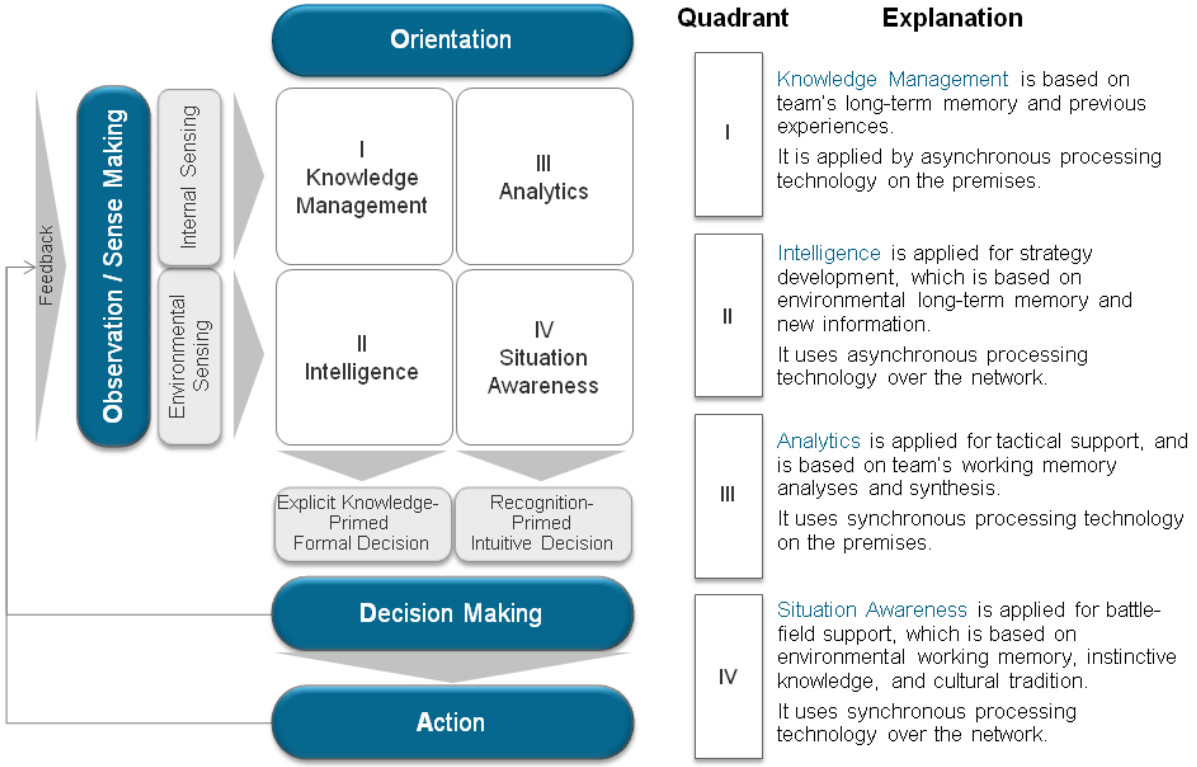
Observation and sensing feed into orientation activities, which, in turn, contribute to decision making. There are four aspects to orientation activity: knowledge management, intelligence, analytics, and situation awareness. Each of these is related to internal and environmental sensing activities, and can feed into both formal and intuitive[7] decision making.

As shown in Figure 6, Quadrant I is Knowledge Management. This capability is based on internal sensing and leads to formal decision making. It relies on the team's long-term memory, experiences, expertise, and shared knowledge. For creative knowledge workers, this organizational capability is critical. It is important to share the experiences of talented people and train the organization's younger generation.

Quadrant II is Intelligence, which is driven by environmental sensing. Like knowledge management, a good intelligence capability leads to a formal decision-making process.

Analytics, shown in Quadrant III, is based on internal sense making and is part of an intuitive decision-making process. The analytics capability uses working memory and synthesis.

Figure 6. Four Quadrants of Organizational Capability Based on the OODA Loop.



Source: Cisco IBSG, 2012

Situation Awareness,[8] shown in Quadrant IV, is triggered by environmental sensing and leads to intuitive decisions based on working memory, instinctive knowledge, and cultural tradition. Situation awareness requires talented people to work together to make intuitive decisions based on environmental observation and their high degree of expertise. In today's dynamically changing world, organizations cannot survive and be competitive by applying only previous experiences and knowledge. It is critical to sense environmental transitions and take action based on the organization's collective, intuitive decision-making capability. It is important to identify the skills and talents available in the team, wherever they exist, and to align them to meet the organization's needs.

Workplace is also an important factor that can help accelerate situation-awareness capabilities. The concept of *obeya* (big war room) is a best practice that has been implemented in many global manufacturing companies. It was first introduced as one of the key success factors of the Toyota Production System. *Obeya* provides *ba*[9] (workplace environment) to accelerate environmental sensing and intuitive decision making, where a cross-functional team can come together to solve problems as quickly as possible. With the collaboration technologies available today, *obeya* can be realized in a virtual meeting space ("virtual *obeya")* as well as in a literal room.

The situation-awareness capability model can create huge opportunities for organizations to make dramatic improvements in performance and productivity.

In order to drive business innovation and adapt quickly to market transitions, all four of the above quadrants need to be activated and accelerated together.

Action Item 7: Sensing-Capability Analysis

In order to enhance sensing capabilities,[10] we need to try to see the object, trend, or process from several different angles. If we stick to what we recognize from past experiences and see the object only from one familiar, fixed viewpoint, we will miss the full reality of the object and where it will move next. With regard to the way of seeing, Masahiro Yasuoka, a famous Japanese philosopher, once said, "We should think about the difference between seeing in the short distance and in the long distance. We should learn how the view will change at first by seeing in one dimension, and then by seeing in multi-dimensions. How will the result change if we see it in details, and if we see it fundamentally?"[11]

It is critical to have environmental sense-making capabilities that include both internal and external perspectives. Internally, you are sensing changes and transitions in your organization's performance and knowledge, and the experience and skills of its members. Externally, your sensing is based on unfolding environmental circumstances and outside information. Improving intelligence capabilities, you look for changes and transitions in external organizations, customers, markets, competitors, allied partners, regulatory trends, and technology.

Environmental sensing is derived from the concept of "non-isolated internal and external"[12] factors, in which the boundaries between internal and external are blurred.[13] Therefore, rather than assuming that an event or transition is purely external, we must always look for threads that may connect it to internal factors.

Action Item 8: Orientation-Capability Analysis

When individuals sense a challenge with which they are not equipped to deal alone, the organization should be able to identify and find a subject-matter expert—either inside or outside the company—who has the knowledge and experience to help.

When we sense transitions, then we need to have an orientation capability to take appropriate actions. Orientation capability is based on the organization's shared vision, framework, and previous experiences and knowledge to find and align appropriate talents to address the challenges observed in the sensing phase. It mainly consists of the autonomous activity of the person who has discovered the challenges. He or she will use existing accumulated knowledge, and will align the persons who have the right experience and expertise to handle the situation.

Based on these orientation activities, we are able to make decisions to take action. There are two types of decision-making activities. One is a formal decision primed by explicit knowledge derived from the orientation activities of knowledge management and intelligence. This has been called "plan" in the traditional PDCA (plan, do, check, and action) management cycle. The other is recognition-primed intuitive decision making[14] based on implicit guidance and control, which are derived from analytics and situation awareness. The recognition-primed intuitive decision is made possible by the collective and aligned talents of expert decision makers who collaborate to drive business innovation. This capability also depends on the group's cultural readiness to embrace risk taking and disruptive challenges.

Example of Sensing and Orientation: Toyota Floor Mat Problem Management

In October 2009, Toyota recalled 3.8 million vehicles in the United States following problems related to "faulty accelerator pedals, which are getting stuck in floor mats, and a problem with braking systems on its hybrid models," according to one news report.[15] Toyota's technical organization in Japan investigated the technical issues based on its experiences and expertise, and responded to U.S. market concerns through a long, formal decision-making process—all part of the Quadrant I Knowledge Management capability. The investigation took too long, much to the dissatisfaction of U.S. government leaders, who finally summoned Toyota President and CEO Akio Toyoda to answer their questions in congressional hearings. Finally, in February 2011, the U.S. Department of Transportation released results from its investigation, saying, "There is no electronic-based cause for unintended high-speed acceleration in Toyotas."[16]

We believe this problem would have been handled more quickly and effectively by using Quadrant IV Situation-Awareness capabilities, rather than relying on the more limited Knowledge Management capabilities of Quadrant I.

Based on this experience, Toyota reformed its organization and placed situation-awareness capabilities in local regional headquarters. The company established regional advisory boards and reformed its public relations organization in order to better sense and reflect external voices, and to respond with the required aligned resources.[17]

Example of Sensing and Orientation: iPod Development

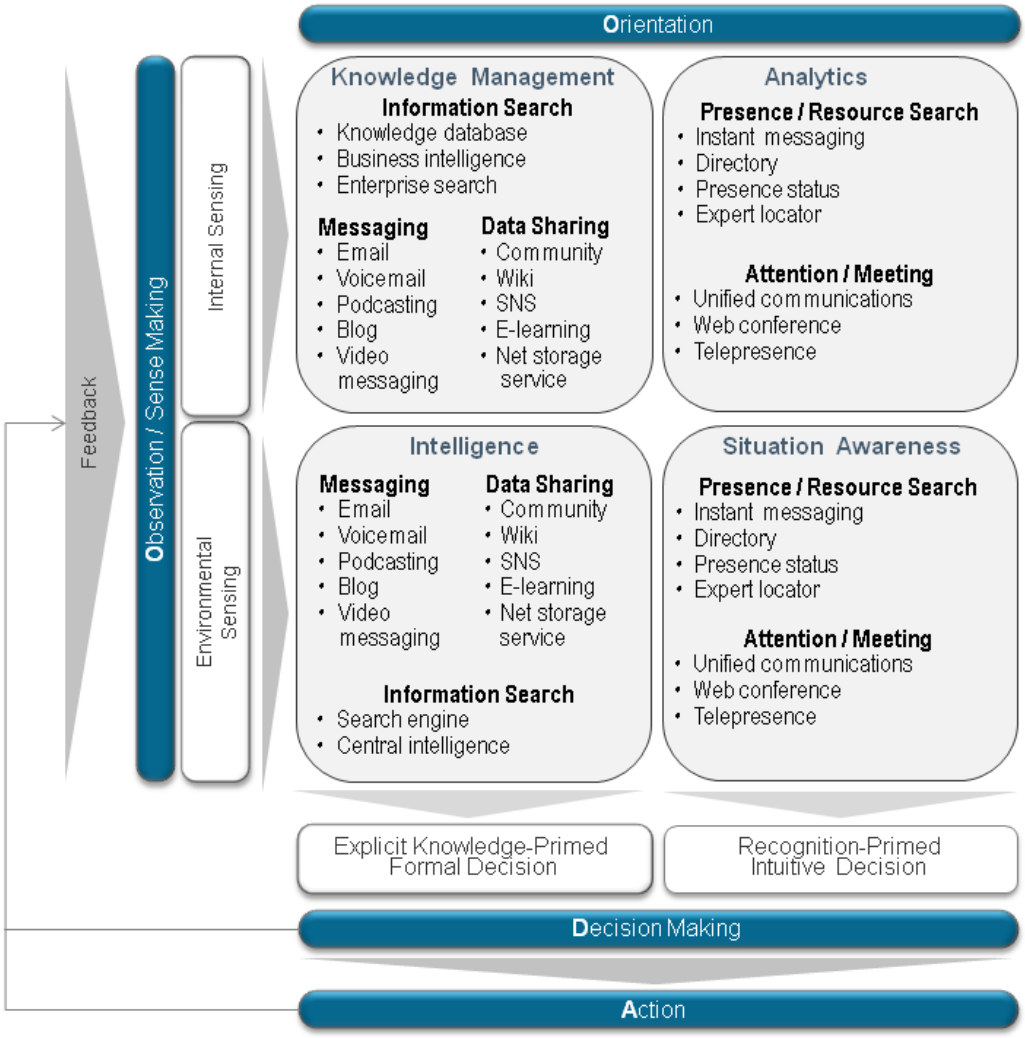
Before Steve Jobs introduced the iPod, Apple had researched the market and its major competitors, including Sony. It discovered that while Sony had good enough technology to implement the iPod concept, the Japanese consumer electronics giant would not be able to introduce a similar product at that time because of internal collaboration constraints within Sony. Armed with this knowledge, Apple went ahead and developed the iPod and the iTunes service, concentrating required skills and technologies in collaboration with technology partners.

Apple had external and environmental sensing capabilities, as well as the orientation capability to align required talents to respond to the market transition. Looking at Figure 6, Apple played in the Quadrant IV domain—Situation Awareness—in addition to Quadrants I, II, and III. Sony had been playing only in Quadrant I—the Knowledge Management domain.

Action Item 9: Technology Measures

Technology implementation itself is not the objective, but it can be a powerful tool for productivity improvement. Appropriate technologies can change the game, especially when used to enhance the organizational capabilities described above.

Figure 7. Technologies To Realize the Sensing and Orientation Organizational Capability.



Source: Cisco IBSG, 2012

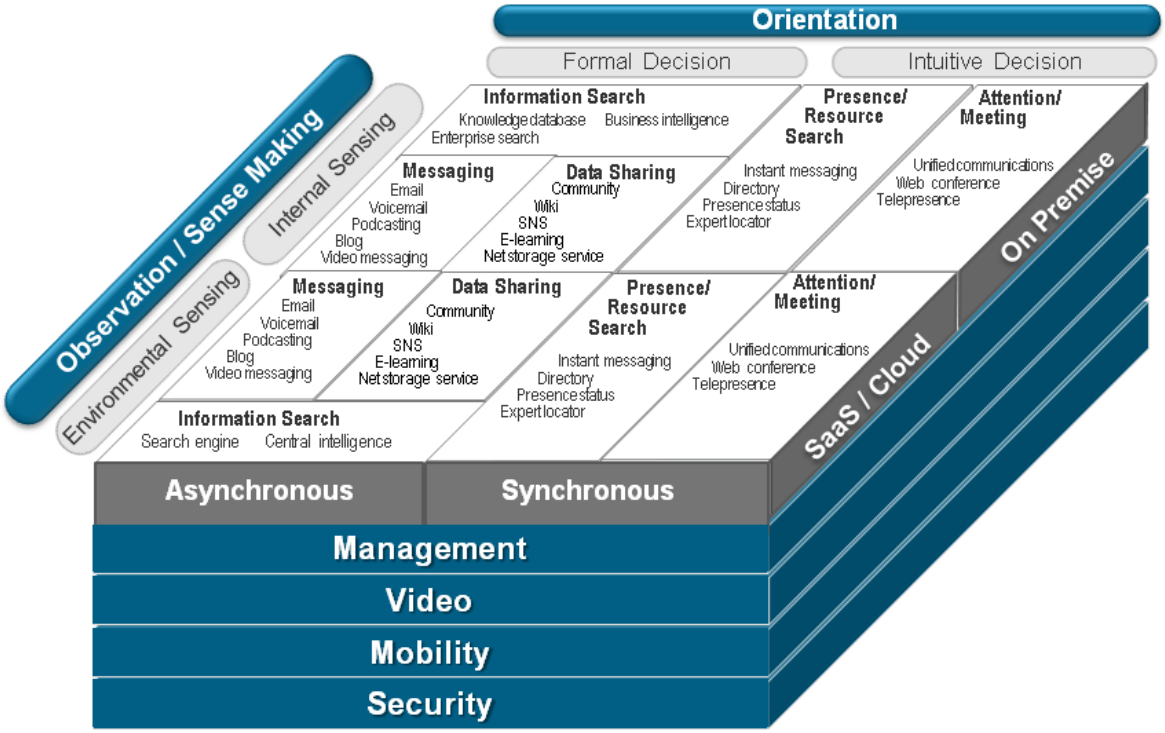
Figure 7 introduces applicable technologies that should be considered for each activity type identified in action item 4 of this methodology. In this figure, activity types have been categorized into the four quadrants of organizational capability. The Quadrant I Knowledge Management capability is performed by the information search, documentation and storing, and messaging activity types. Quadrant II Intelligence is carried out by the environmental information search, documentation and storing, and messaging activity types. Quadrant III Analytics is done by the presence search and attention/meeting activity types. Quadrant IV Situation Awareness is done by external and internal presence search and attention/meeting activity.

So, for example, as shown in Figure 7, unified communications, web conferencing, and telepresence could be considered for attention/meeting activities in the Analytics and Situation Awareness space. Knowledge database, intelligence, search engine, wikis, net storage service, video messaging and others are candidates for the information search, documentation and storing, and messaging activity types.

After taking an inventory of technologies used, we have found that many companies are mainly using technologies that reside in the Knowledge Management and Intelligence quadrants. In order to address transitioning markets for business innovation, enterprises should also leverage emerging technologies to strengthen their organizational capabilities in the Analytics and Situation Awareness spaces.

When we consider implementing technologies, we need to identify not only opportunities to reduce non-value-added activities, but also opportunities to accelerate value-added processes. Additionally, we should look for ways to apply technologies that can strengthen the organization's situation awareness.

Figure 8. Baseline Enabling Technologies.



Source: Cisco IBSG, 2012

In implementing these application technologies, it is also critical to consider the baseline enabling technologies—such as video, mobility, and security—needed to transform the enterprise workstyle (see Figure 8).

Figure 8 also shows the different kinds of processing required for activities in each of the quadrants. Attention/meeting for co-working and presence/resource search are applied to the Analytics and Situation Awareness quadrants. These are synchronous processes where the work is performed in real time.

Information search, messaging, and data sharing are applied to the Knowledge Management and Intelligence quadrants. These are asynchronous activities that use batch processing.

As for environmental sensing intelligence and situation awareness, technologies need to be SaaS/cloud-based in order to extend across entity boundaries. Additionally, as situation

awareness is enhanced by the rise of smart mobile devices, organizations need technology to enable communication from any device to any other device, in any location.

Action Item 10: Resource-Management Analysis

In many companies, both the internal and external resources used for revenue generation are very limited, while opportunities for revenue creation seem unlimited. Resource-management analysis enables companies to evaluate the trade-offs and optimize resource allocation. There are two approaches that companies can consider. The first is customer portfolio management, in which the limited resources of the salesforce are dynamically allocated to maximize customer equity. The second approach is product/offering portfolio management, in which limited engineering resources are intelligently allocated to maximize revenue.

Action Item 11: Performance-Management Analysis

After resolving business process and organizational issues, enterprises should analyze the key performance indicators (KPIs) of the division responsible for the target process. If KPIs consistently extend from the senior management team to lower-level management, then the corporate strategic agenda will be implemented smoothly.

At workshops, current environmental analysis and identification of improvement opportunities are performed by applying action items 3 through 11. Implementation plans are presented and approved by the managers attending the workshops. Quick-hit implementation plans can be executed immediately, and investment plans will follow.

Action Item 12: Continuous Innovation

For continuous productivity improvement and a better way of working, organizations should create a workstyle-innovation program management office (PMO). The primary role of the PMO is to share best practices, analysis tools, and proven methodologies, and to monitor key performance indicators such as the value-added activities ratio. Leadership of PMO is a key component of continuous innovation.

Critical Success Factors for Workstyle Innovation

Enterprises that embark on a path of transformation for productivity improvement should keep in mind several critical success factors that we have identified during consulting engagements with major customers:

- Workstyle innovation is not just about ICT implementation. It requires a fundamental cultural shift to create a firm foundation for business innovation by always adopting the customer's viewpoint.
- Team members must take ownership of the transformation process; they are the creators, not the targets, of change.
- Workstyle innovation is not about headcount reduction, but about finding better ways of working that create value and innovation.
- A successful workstyle-innovation process requires consensus among all participants, not just a directive from top management.

- After implementing improvement measures, organizations should confirm results repeatedly and search for further improvement opportunities.
- Never stick to the existing framework. We need to think outside the box and involve various aspects that were not considered in the existing framework.

The effectiveness of the workstyle-innovation methodology has been demonstrated in several Cisco IBSG customer engagements. The principles can be applied across most industries and public-sector entities, resulting in significant productivity improvements.

For more information or to inquire about a workstyle-innovation workshop, please contact:

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Endnotes

1. *Flocks, Herds, and Schools: A Distributed Behavioral Model,* Craig W. Reynolds, Symbolics Graphics Division, Proceeding of SIGGRAPH `87 ("Computer Graphics" 21, Number 4, July 1987, edited by Maureen C. Stone, pages 25-34).
2. *The Dynamics of Collective Sorting, from Animals to Animats,* Jean-Louis Deneubourg, Simon Goss, Nigel R. Franks, Ana B. Sendova-Franks, Claire Detrain, and Laeticia Chrétien, MIT Press, 1990.
3. Cisco IBSG has worked with global companies, including Toyota Motor Corporation, which have achieved significant productivity improvement. This success story is summarized in "Toyota Streamlines Business Processes, Boosts Productivity by 18 Percent," Cisco IBSG, 2011, http://www.cisco.com/web/about/ac79/docs/success/Toyota_Boosts_Productivity_IBSG.pdf
4. Productivity is defined as the ratio of output (added value) and input. Productivity in general has three categories: labor productivity, capital productivity, and total factor productivity. Labor productivity is the added value divided by the labor time or labor cost. In most industries and in most public-sector entities, since labor is the largest share of total cost, and contributes a comparatively large share of added value, labor productivity is the most important metric. This indicator is widely used in discussions of national productivity measurement and international productivity comparison. In this white paper, we call labor productivity simply "productivity."
5. RACI analysis is introduced by many books, including *Business Process Mapping: Improving Customer Satisfaction,* J. Mike Jacka, Paulette J. Keller, Wiley; 2009.
6. OODA is a process that describes how humans react to stimulus, which was developed by Col. John Boyd, USAF (Ret) during the Korean War. This is the decision-making technique originally applied to help fighter pilots make faster, more accurate decisions. *Science Strategy and War, The Strategic Theory of John Boyd,* Frans Osinga, Abingdon, Routledge, 2007.
7. *Sources of Power, How People Make Decisions,* Gary Klein, MIT Press, 1998; "The Power of Intuition," Gary Klein, Currency Doubleday, 2003.
8. "Situation awareness" is a term coined in the military context, first used by John Boyd in the 1950s, and later applied to the business context. *Boyd,* Robert Coram, Back Bay Books, 2002; *Situation Awareness Analysis and Measurement,* Mica R. Endsley, Daniel J. Garland, CRC Press, 2000; *Designing for Situation Awareness,* Mica R. Endsley, Betty Bolte and Debra G. Jones, Taylor & Francis, 2003.
9. The Japanese word *ba* is "place" in English, but not necessarily just a physical space. *Ba* is a space that provides an atmosphere for collaboration, which is a Japanese management concept developed by Ikujiro Nonaka: *SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation,* Ikujiro Nonaka; Ryoko Toyama and Noboru Konno, *Long Range Planning,* pages 5-34, 2000.
10. *Sensemaking in Organizations,* Karl E. Weick, SAGE Publications, 1995; *Making Sense of the Organization,* Karl E. Weick, Blackwell Publishing, 2001;

Making Sense of the Organization, Volume Two, Karl E. Weick, Blackwell Publishing, 2009.

11. *Lively Eyes and Lively Philosophy,* Masahiro Yasuoka, PHP, 2007.
12. The concept of "non-isolated internal and external" was introduced in *Ba and Co-creation,* Hiroshi Shimizu, Takayuki Miwa, Tadashi Kume, Yoshihiro Miyake, NTT Publication, 2000.
13. Stan Davis and Christopher Meyer discussed that three factors in the connected world—speed, connectivity, and intangibles—are causing the boundaries of other formerly distinct categories to blur: *Blur: The Speed of Change in the Connected Economy,* Stan Davis and Christopher Meyer, Grand Central Publishing, 1999.
14. In 1985 Gary Klein et al. developed the recognition-primed decision-making model. By studying decision making in the army and by firefighters, they realized that these expert decision makers were not comparing lists of options. They were not even comparing two options.
15. BBC News, February, 24 2010.
16. U.S. Transportation Secretary Ray LaHood, quoted in National Highway Traffic Safety Administration press release, February 8, 2011.
17. Toyota press release, March 9, 2011.

More Information

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