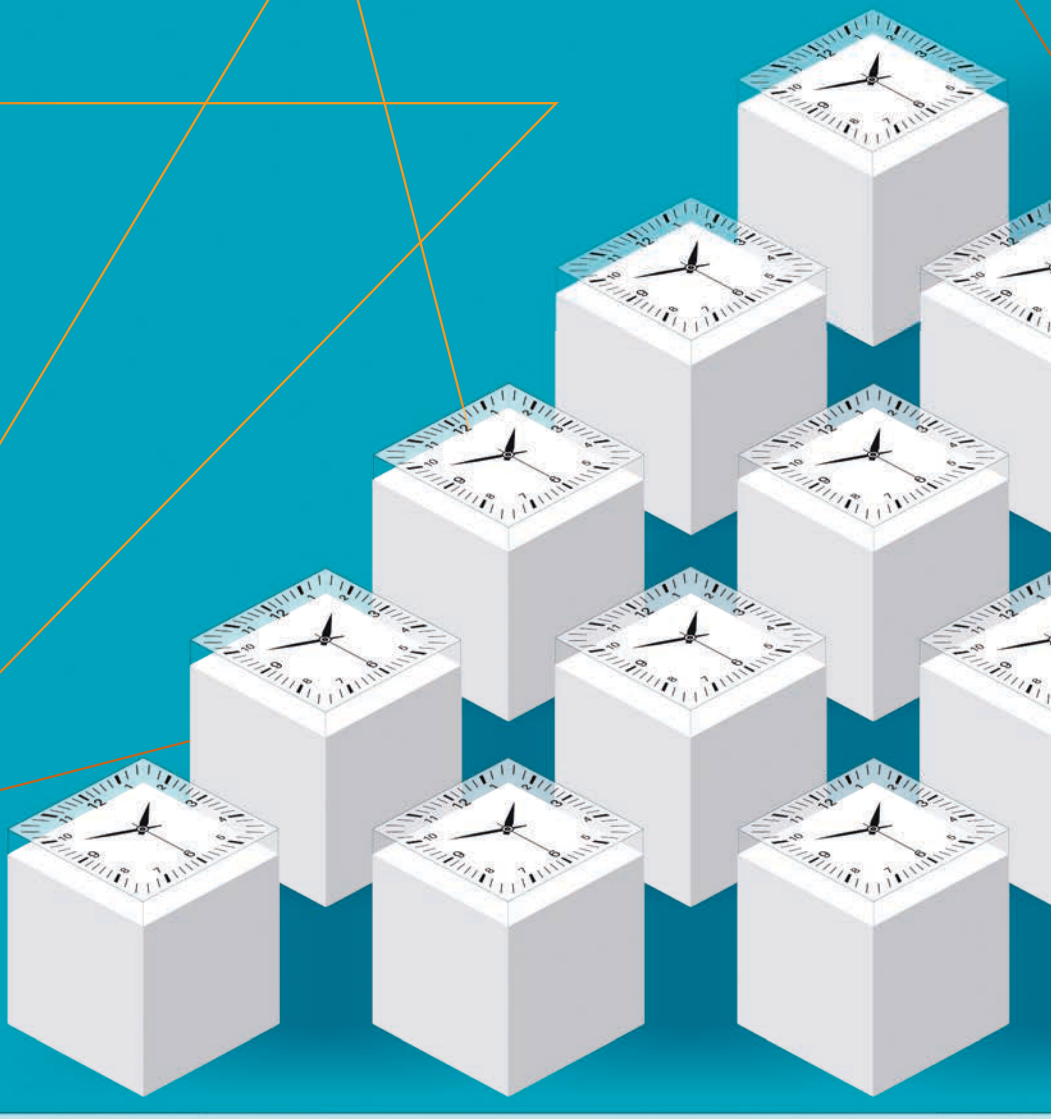


THE BUILDING BLO

An in-depth look at each facet of the TIME pyramid | by H. James Harrington

Dmitrii_Guzhanin/Chubarovy via Getty Images

CKS OF TIME

Part 2

Part 1 appeared in the June issue

Just the Facts

The total innovation management for excellence (TIME) method—also known as the TIME pyramid—provides a complete organizational structure that stimulates innovation and creativity.

The TIME pyramid is made up of 16 building blocks that construct an organizational profile designed to consider each stakeholder's desires. The building blocks are aligned strategically with one another to increase the organization's efficiency, effectiveness and adaptability for today's artificial intelligence and robotics world.

This article is the second part of a two-part series on the total innovation management for excellence (TIME) method. Part one, "Now Is the TIME," which appeared in the June 2020 issue,[1] provided a general overview of the TIME method, also called the TIME pyramid. This article provides a detailed description of the 16 building blocks that comprise the TIME pyramid.

The TIME method provides a complete organizational structure that stimulates innovation and creativity. It is designed to help an organization develop an innovative culture.

International Organization for Standardization (ISO) technical committee 279 prepared the international standard for innovation, *ISO 56000:2020—Innovation management—Fundamentals and vocabulary*. For years, innovative organizations and consultants have debated how to define "innovation." Presently, ISO defines it as a "new or changed entity, realizing or redistributing value."[2]

An innovation can be a product, service, process, model, method, or any other entity or combination of entities. Furthermore, a model can be the business model, operational model or any other value realization model. Anything in any area can be innovated.

A product or process is innovative if it produces a unique or different product or service, as viewed by consumers. Therefore, I prefer to use the following definition: "People creating value through the implementation of new and unique ideas."

The ISO standard and definition, as well as my definition, point to continuous improvement as an important ingredient in the innovation process. It's easy to understand why ISO has taken the approach of including continuous improvement as part of the innovation activities because between 70% and 95% of all patents could be classified as continuous improvement activities. Based on a study of thousands of patents and technological systems, Genrich Altshuller, an engineer, inventor and writer, proposed that five levels of invention exist:

+ **Level one:** Apparent solution—68.3% of the total innovation process.
+ **Level two:** Minor improvement—27.1% of the total innovation process.
+ **Level three:** Major improvement—4.3% of the total innovation process.
+ **Level four:** New paradigm—0.24% of the total innovation process.
+ **Level five:** Discovery—0.06% of the total innovation process.[3]

Figure 1 shows the five levels of innovation and their contribution to the total innovation process.

Of the five levels of innovation, levels one and two account for about 95% of all improvements. Certainly, most level-one and level-two improvements fall into the continuous improvement classification. Levels three, four and five serve as the foundation of advanced breakthroughs.

Most books about innovation focus on levels four and five, but the ideas presented depend on continuous improvement methods to bring about the major portion of innovation improvement. In either case, continuous or breakthrough improvements must be considered broadly as a process, rather than narrowly as an activity.

Based on my experience and studies, I estimate that, conservatively, 58% of all breakthrough improvements are never capitalized on due to a lack of follow-through in implementation. Often, it's more difficult to identify and quantify an improvement opportunity than to design a product or process that takes advantage of the improvement opportunity.

As much as we need a process to create solutions to our improvement opportunities, we also need an innovation system that transforms the solution into an output, such as the innovation systems cycle (Figure 2). As a result, improvement system activities must cover and support:

+ Product innovation.
+ Process innovation.
+ Management innovation.
+ Sales and marketing innovation.
+ After-sales service innovation.
+ Supplier innovation.

The TIME pyramid (see Online Figure 1, which can be found on this article's webpage at qualityprogress.com) is made up of 16 building blocks that integrate this holistic approach into innovation. The building blocks construct an organizational profile designed to consider each stakeholder's desires. The building blocks also are strategically aligned with one another to increase an organization's efficiency, effectiveness and adaptability.

BUILDING BLOCK 1

THE FOUNDATION

The foundation of the TIME pyramid is built on bedrock to provide maximum stability. It assures stakeholders that the organization's activities are stable and well-constructed. No matter how elaborate the construction is, the organization is doomed for failure without a good foundation. Too many of today's technologies are built on a sand base. As such, they look beautiful for a while but slowly decay, taking with them the organization's culture, investors' money and employees' jobs.

FIGURE 1

5 levels of innovation

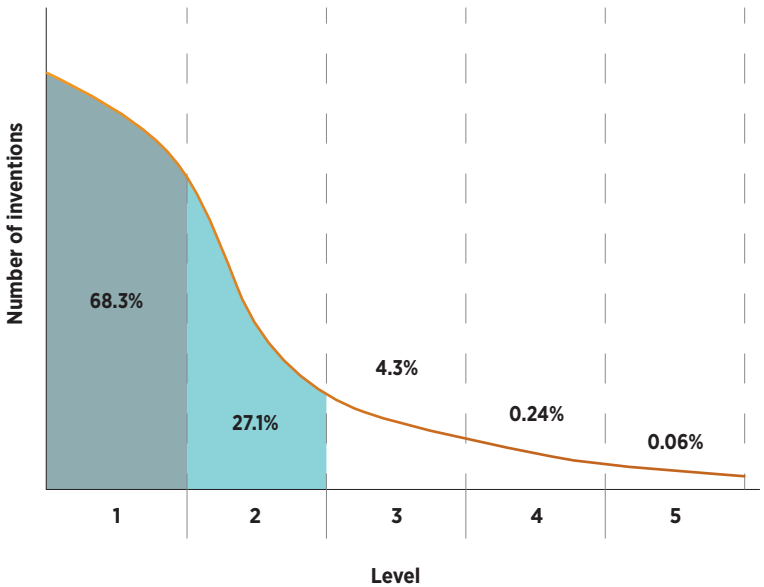


FIGURE 2

Innovation systems cycle

Phase I. Creation

- Process grouping 1—Opportunity identification
- Process grouping 2—Creation activity
- Process grouping 3—Value proposition
- Process grouping 4—Concept validation

Phase II. Preparation and production

- Process grouping 5—Business case analysis
- Process grouping 6—Resource management
- Process grouping 7—Documentation
- Process grouping 8—Production

Phase III. Deliver

- Process grouping 9—Marketing, sales and delivery
- Process grouping 10—After-sales services
- Process grouping 11—Performance analysis
- Process grouping 12—Transformation

BUILDING BLOCK 2

INNOVATIVE ORGANIZATIONAL ASSESSMENT

It is impractical to start any type of innovation improvement effort without establishing what your present situation is. One of the major mistakes many organizations make is thinking the executive team has an excellent understanding of what problems the workforce is facing. Often, the executive team has a more positive view of the organization's operations than the employees, who have a different opinion (see Figure 3, p. 43).

It is absolutely essential for an organizational assessment to collect information related to the needs, expectations and desires of the executive team, middle management and employees.

BUILDING BLOCK 3

INNOVATIVE EXECUTIVE LEADERSHIP

My grandmother used to say, "If you're going to sweep the stairs, always start at the top."

Top and executive management must do more than just support TIME. Innovation improvement initiatives should start with the board of directors. The primary responsibility of an organization's CEO is to meet the requirements of the board of directors. Performance is not based on what the CEO says; it's based on what the board of directors says.

Of course, members of the total executive team must be part of the process, participate in designing the process, assign resources and give their personal time freely. The start of any improvement process is the total top executive team's leadership and belief that it will be successful.

BUILDING BLOCK 4

PERFORMANCE AND CULTURAL CHANGE MANAGEMENT PLAN

All employees must understand why the organization exists, what the behavioral rules are and where the organization is going. This direction must be well-communicated to the stakeholders, and there must be an agreed-upon plan for how the organization wants to change.

That is what a business plan does for an organization. It sets the direction of the business and determines what products it

will provide, what markets it will service and its future goals. Without an agreed-upon and well-understood business plan that is implemented effectively, the organization has no direction and will go nowhere.

BUILDING BLOCK 5

COMMITMENT TO STAKEHOLDERS' EXPECTATIONS

Every organization has an obligation to the individuals affected by its activities, including investors, management, employees and their families, suppliers, customers, consumers, the community and interested parties. Investors, for example, want decreased costs so they can be paid bigger dividends. One of the biggest problems top management faces is how to balance the organization's activities so all stakeholders agree with the way the organization is managed.

BUILDING BLOCK 6

INNOVATIVE PROJECT MANAGEMENT SYSTEMS

The Project Management Institute recently issued an updated version of *A Guide to the Project Management Body of Knowledge: PMBOK Guide*.[4] It is a well-prepared, comprehensive book that provides detailed guidance for large and small projects. In many organizations, the biggest innovation improvement opportunities are high project failure rates.[5]

BUILDING BLOCK 7

INNOVATIVE MANAGEMENT PARTICIPATION

Often, an organization's biggest problem is not applying innovation to the management method. This building block is designed to get all levels of management actively participating in the improvement effort. Ensuring management feels comfortable in a leadership role is essential to the success of the total process.

It is important to bring about the proper change in top, middle, and first-line managers and supervisors before introducing the concepts to employees. Most organizations have done a poor job of preparing management for its new leadership role. As a result, it is still using the same principles that were used in the 1980s. All too often, the management rule is, "Do what I say, not what I do."

BUILDING BLOCK 8

INNOVATIVE TEAM DEVELOPMENT

The organization must take advantage of manager and employee teams to take maximum advantage of improvement opportunities

I often hear the theory that a team of two generates three times the output of a team of one. But I've also seen many occasions when a team of two generates 0.7 times the output of a team of one due to the compromises required to obtain a consensus decision.

BUILDING BLOCK 9

INDIVIDUAL CREATIVITY, INNOVATION AND EXCELLENCE

Management must provide the environment, as well as the tools, that will allow and encourage employees to excel and take pride in their work, and then reward them based on their accomplishments. This is another key ingredient in every winning organization's strategy. You can have a good organization using teams, but you can have a great organization only when each employee excels in every job he or she performs.

BUILDING BLOCK 10

INNOVATIVE SUPPLY CHAIN MANAGEMENT

Winning organizations have winning suppliers. And, inevitably, the destiny of both organizations is linked. After the innovation improvement process takes hold in the organization, it is time to work with the suppliers.

BUILDING BLOCK 11

INNOVATIVE DESIGN

An innovative design doesn't gradually change, even though the change is in a positive direction. An innovative design jumps—rather than steps—forward in the march for progress. From a consumer's standpoint, an innovative design is significantly better than anything else that's available. From an organization's standpoint, it must add more value than the cost to develop, produce, sell and maintain it through its warranty period.

It doesn't take long for an innovative design to no longer be innovative because it no longer is significantly better than what is available from other sources. The first time meat was cooked over a fire was innovative; having a barbecue in the backyard is not innovative.

After 70 years—during which the largest percentage of my time was spent problem-solving—I realized that in most cases, the poor design of products, processes, organizational structures and methods is the real root cause of a problem. Organizations are focused on correcting symptoms, however, rather than preventing a repeat of the same problem in the next product cycle. An innovative designer delivers a design that is efficient, effective and adaptable, and meets customer expectations.

The current trend of focusing on minimizing risk must give way to preventing errors from occurring. To accomplish this, tools such as design for X must be incorporated into a design method and evaluation. Typical design-for-X techniques are design for:

+ Manufacturability.
+ Reliability.
+ Repairability.
+ Safety.
+ Cost.

Increased emphasis must be placed on knowledge management. Most designs are reviewed by several functions, so an individual function isn't held accountable for finding errors. All errors that occur after a design review should be charged to the organization being paid to review the design, not to the design department.

Unfortunately, we all have become accustomed to using our customers as the final testers. It's fast but sloppy. To offset this trend, improve effectiveness tools such as business process improvement, total quality management, activity-based costing and lean. With today's short product cycle times, it's too late to correct a problem if the manufacturing process has started. By the time you find and correct the problem,

the product cycle is over and the organization is left with an extensive recall. It means we must develop innovative ways to evaluate potential and improvement opportunities.

BUILDING BLOCK 12

INNOVATIVE ROBOTICS AND ARTIFICIAL INTELLIGENCE (AI)

This building block focuses on how to design and maintain product and service-delivery processes so they consistently satisfy external and internal customers and the people who consume the end product.

Innovative use of technology, automation and AI has drastically changed the way processes are designed and function:

+ Automation has made concepts such as Six Sigma practical in manufacturing processes.
+ Technology provides new products almost monthly.
+ AI allows a computer to perform operations analogous to human learning and decision making using an expert system, a program for computer-aided design or computer-aided manufacturing, or a program for the perception and recognition of shapes in computer vision systems.

In many applications, it is impossible for humans to make decisions as fast as or as accurately as AI. The combination of innovative personnel using technology, automation and AI is bringing us closer every day to the ultimate factory of the future. Future accuracy, repeatability, dependability and precision won't be in the hands of a human, but in the programming designed into the new computerized environment.

This building block shows how to use automation, technology and AI to reduce costs, help create new products and reduce cycle time while improving the quality of the delivered product. For example, who would've believed just a few years ago that computers—not waiters and waitresses—would be taking our orders in a restaurant?

BUILDING BLOCK 13

KNOWLEDGE ASSET MANAGEMENT

Today more than ever, knowledge is the key to an organization's success. Instead of having one or two resources of information, the internet provides hundreds—if not thousands—of inputs, all of which must be researched for key nuggets of information. We are so overwhelmed with so much information that we don't have time to absorb it all, so we depend on a computer to do it for us.

To make matters worse, most of an organization's knowledge is still undocumented and rests in the minds and experiences of its employees. This knowledge disappears from the organization's knowledge base every time an employee leaves.

An organization's first challenge is determining how to collect that undocumented knowledge from its employees. Its second challenge is determining how to prevent outside sources, including the competition, from hacking into its knowledge base.

BUILDING BLOCK 14

COMPREHENSIVE MEASUREMENT SYSTEMS

This building block helps the organization develop a balanced measurement system that demonstrates how interactive measurements, such as quality, productivity and profit, can either detract from or complement one another. Organizations must consider all stakeholders, which means converting a defect's effect on the consumer into the analysis cycle.

Only when the improvement process documents positive measurable results can management be expected to embrace the method as a way of life. A good measurement plan converts the skeptic into a disciple.

BUILDING BLOCK 15

INNOVATIVE ORGANIZATIONAL STRUCTURE

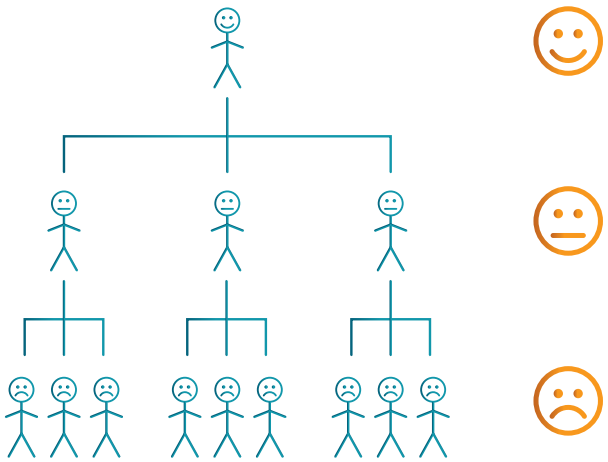
In this new environment, employees are empowered to do their jobs and are held accountable for their actions. With these changes, large organizations must give way to small business units that can react quickly and effectively to changing customer requirements and the changing business environment.

This building block helps the organization develop an organizational structure that meets today's needs and tomorrow's challenges. For example, I worked for a city government to make the city more customer-centric. During the project, we learned that most of the managers were interested in their work assignment, not developing their people. We also learned many of them were put into a managerial role because they were the most technically competent, not because they would be a good business manager or good at developing their employees.

The managers were reluctant to leave their management positions because the title was an important status indicator and, in most cases, management-level salaries paid better.

FIGURE 3

View of the organization based on position in the organization



By establishing a dual ladder, we based the pay scale on the employees' contributions, not their titles. So a senior engineer and a first-level manager could have equal pay and status in the organization, for example, and an advisory engineer could have equal pay and status compared to a second-level manager.

By reducing the importance and status of titles and instead emphasizing skill level, many of the highly technical managers volunteered to moved out of management and into a prestigious technical position. As a result, two layers of management and a number of individual departments were eliminated.

BUILDING BLOCK 16

REWARDS AND RECOGNITION

The rewards and recognition process should be designed to pull together the total pyramid. It must reinforce and reward individuals who perform and keep with the organization's desired behaviors. It also must be comprehensive because everyone hears "thank you" differently. If you want everyone to take an active role in your improvement process, you must be able to thank each individual in a way that is meaningful to him or her. There is a time for a pat on the back and a time for a pat on the wallet. Your rewards and recognition process should include both.

The future

The TIME method stimulates innovation and creativity in any organization. It requires many different supporting activities to bring about the required changes organizations are facing in today's AI and robotics world.

The challenging world of the future requires a different way of thinking, working and managing. The future environment is:

+ **F** = Faster.
+ **U** = Uncertain.
+ **T** = Turbulent.
+ **U** = Universal.
+ **R** = Revolutionary.
+ **E** = Ethical.

The TIME method helps organizations change their cultures and improvement methods to solve current and future problems. QP

REFERENCES AND NOTE

1. H. James Harrington, "Now Is the TIME," *Quality Progress*, June 2020, pp. 36-41.
2. International Organization for Standardization (ISO), *ISO 56000:2020—Innovation management—Fundamentals and vocabulary*, subclause 4.1.1.
3. Genrich Altshuller, "Levels of Solutions," in *To Find an Idea*, third edition, Petrazavodsk, 2003 (in Russian).
4. Project Management Institute (PMI), *A Guide to the Project Management Body of Knowledge: PMBOK Guide*, PMI, 2017.
5. For more information on decreasing the number of project failures, read Christopher F. Voehl, H. James Harrington and William S. Ruggles, *Effective Portfolio Management Systems*, CRC Press, 2015.

H. James Harrington is CEO of Harrington Management Systems in Los Gatos, CA, and a founding member of the Asia Pacific Quality Organization. He received a doctorate in engineering management. Harrington has received many ASQ medals, including the Distinguished Service Medal, the Edwards Medal, the Ishikawa Medal and the Lancaster Medal. The ASQ Inspection Division also created the H. James Harrington Scholarship in his honor. Harrington is a fellow of ASQ, as well as a former president and chairman. He is an ASQ-certified quality engineer and has written more than 50 books on performance improvement.