Foreword

21st Century Skills: Why They Matter, What They Are, and How We Get There

Ken Kay, President, Partnership for 21st Century Skills

The writer Malcolm Gladwell (2000) astutely describes how and why social change happens when we arrive at a "tipping point," the moment when a critical mass of circumstances come together and sets us on a new and unstoppable course. Scientists, economists, and sociologists all use this term to describe moments when significant change occurs and results in a new reality that is markedly different from the old.

I believe we are on the threshold of a tipping point in public education. The moment is at hand for a 21st century model for education that will better prepare students for the demands of citizenship, college, and careers in this millennium.

I am honored that the editors have asked me to introduce this book and set the context with the overarching theme of 21st century skills, using the Framework for 21st Century Learning developed by the Partnership for 21st Century Skills (2009a). This book is a compilation of reflections on the possibilities for 21st century learning by some of the most thoughtful educational minds in the United States. It is gratifying that so many of them are engaged in envisioning and

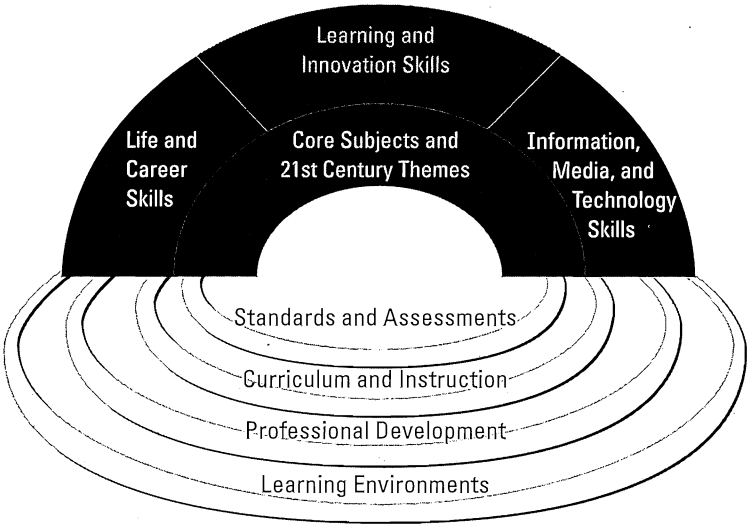
substantiating more robust approaches to educating young people, particularly since those of us in the Partnership have worked since 2001 on the same exciting project.

The vision for 21st Century Learning offers a holistic and systemic view of how we can reconceptualize and reinvigorate public education, bringing together all the elements—21st century student outcomes and 21st century education support systems—into a unified framework.

The vision for 21st century learning developed by the Partnership for 21st Century Skills (2009a), summarized in figure F.1, offers a compelling context for the chapters in this volume. This vision offers a holistic and systemic view of how we can reconceptualize and reinvigorate public education, bringing together all the elements—21st century student outcomes and 21st century education support systems—into a unified framework. For us, the starting point for this framework is actually the end result: the outcomes—in terms of mastery of core academic subjects, 21st century themes, and 21st century skills—that should be expected of students once they leave school to venture successfully into higher education, workplaces, and independent life. It's only when we understand these outcomes that we can then begin building the supporting infrastructure that will lift the education system to commanding heights. The raison d'être for the support systems—standards and assessments, curriculum and instruction, professional development, and learning environments—should be to achieve the results that truly matter for students.

Without a clear and thorough articulation of the outcomes that students need, reshaping the infrastructure is premature. Here's an analogy: if you are building a house, it doesn't make sense to order the plumbing fittings before the architect finishes the design specifications. In education, 21st century student outcomes *are* the design specs for the rest of the system.

The Partnership has crafted an all-encompassing vision for a 21st century education system. We don't have all the answers, however. As the contributions to this book make clear, there are many more wonderful ideas percolating that will strengthen the vision of 21st century learning and help transform every aspect of the system.



Core Subjects

- English, Reading, or Language Arts
- World Languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

21st Century Themes

- Global Awareness
- Financial, Economic, Business, and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy
- Environmental Literacy

Learning and Innovation Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Information, Media, and Technology Skills

- Information Literacy
- Media Literacy
- Information and Communications Technology (ICT) Literacy

Life and Career Skills

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

21st Century Education Support Systems

- 21st Century Standards and Assessments
- 21st Century Curriculum and Instruction
- 21st Century Professional Development
- 21st Century Learning Environments

Source: Partnership for 21st Century Skills, 2009a. Reprinted with permission.

Figure F.1: The Partnership for 21st Century Skills Framework for 21st Century Learning.

We aren't rigid about the language used to describe 21st century skills, either. We say *adaptability*, for instance, while others prefer *resiliency*. We say *critical thinking*; others say *systems thinking*. No matter—we're all talking about the same concepts. On the other hand, the term *21st century skills* is not a vague and squishy catchword that can mean anything. Every element of our model has been defined, developed, and vetted by leading experts, scholars, educators, business people, parents, and community members.

We invite individuals and organizations to use our framework to spark a lively national dialogue about all of the elements required for enriching 21st century minds. It is particularly important to engage educators and representatives of the business community in this dialogue (Wagner, 2008). It's critical for states, districts, and schools to have these conversations and agree on the student outcomes they value—and then to create systems that can deliver.

Why Do We Need a New Model for Education in the 21st Century?

The forces instigating the inevitable changes on the horizon in education have been building for some time:

- **The world is changing**—The global economy, with its emerging industries and occupations, offers tremendous opportunities for everyone who has the skills to take advantage of it. There has been a dramatic acceleration in global competition and collaboration over the past thirty years, spurred by information and communications technology. The service economy, which is driven by information, knowledge, and innovation, has supplanted the industrial economy and reshaped businesses and workplaces. More than three-quarters of all jobs in the United States are now in the service sector. Manual labor and routine tasks have given way to interactive, nonroutine tasks—even in many traditionally blue-collar occupations. Technology has replaced workers who perform routine work, while it complements workers with higher-level skills and empowers them to be more productive and creative (Autor, Levy, & Murnane, 2003). Advanced economies,

innovative industries and firms, and high-growth jobs increasingly reward people who can adapt and contribute to organizations, products, and processes with the communications, problem-solving, and critical-thinking skills that enable them to customize their work and respond to organizational expectations (Partnership for 21st Century Skills, 2008).

The forces instigating the inevitable changes on the horizon in education have been building for some time:

- The world is changing.
- U.S. schools and students have not adapted to the changing world.
- The United States has no clear sense of purpose or direction for securing our future economic competitiveness.

In this era of rapid change, the social contract prevalent for a good part of the last century doesn't exist anymore. Doing well in school no longer guarantees a lifelong job or career as it did for previous generations of Americans. Today, people can expect to have many jobs in multiple fields during their careers. The average person born in the later years of the baby boom held 10.8 jobs between the ages of eighteen and forty-two, according to the U.S. Bureau of Labor Statistics (Bureau of Labor Statistics, U.S. Department of Labor, 2009). The new social contract is different: only people who have the knowledge and skills to negotiate constant change and reinvent themselves for new situations will succeed. Competency in 21st century skills gives people the ability to keep learning and adjusting to change. Twenty-first-century skills are the ticket to moving up the economic ladder. Without 21st century skills, people are relegated to low-wage, low-skill jobs. Proficiency in 21st century skills is the new civil right for our times.

- **U.S. schools and students have not adapted to the changing world**—Our current public education system is not preparing all students for the economic, workforce, and citizenship opportunities—and demands—of the 21st century. Many students do not receive the family and societal support they need to stay in school. On top of that, many students are

not engaged or motivated in school learning that seems out of step with their lives and irrelevant to their futures. The high school dropout rate has reached crisis proportions, with only 70 percent of students—and only 50 percent of minorities—graduating from high school on time and with a regular diploma (Swanson, 2009).

Alarmingly, we now face two achievement gaps—one national and one international. Nationally, Black, Hispanic, and disadvantaged students perform worse than their peers on national assessments (see, for example, Grigg, Donahue, & Dion, 2007; Lee, Grigg, & Donahue, 2007; National Center for Education Statistics, 2009), dragging down the collective capacity of the future workforce. This is especially troubling as the demographics of the United States are shifting, with minority populations growing at a much faster pace than the rest of the population (U.S. Census Bureau, 2008).

Internationally, American students score lower than the average on the Programme for International Student Assessment (PISA), the benchmark assessment in reading, mathematics, and science for the developed countries of the world (see, for example, Organisation for Economic Co-operation and Development, 2009). PISA results are telling because these assessments measure the applied skills—what we call *21st century skills*—of critical thinking and problem solving. Even the best U.S. students cannot match their peers in other advanced economies on PISA.

Even if all students earned a high school diploma and mastered traditional academic subjects, they *still* would be ill prepared for the expectations of the new economy. Today, a different set of skills—21st century skills—increasingly powers the wealth of nations. Skills that support innovation, including creativity, critical thinking, and problem solving, are in great demand (Casner-Lotto & Barrington, 2006; Conference Board, 2007; Lichtenberg, Woock, & Wright, 2008), yet employers report substantial deficiencies in these and other applied skills among even college-educated entrants into the workforce.

Educational attainment is no longer a guarantee of either academic or skills proficiency (van Ark, Barrington, Fosler, Hulten, & Woock, 2009).

- **The United States has no clear sense of purpose or direction for securing our future economic competitiveness**—The United States remains the most competitive nation on the planet, but "creeping complacency" could erode this dominance (International Institute for Management Development, 2009; Scott, 2009). Science, technology, engineering, and mathematics (STEM) experts in industry and higher education have been warning for years that the United States is losing ground when it comes to preparing an adequate supply of workers for these critical fields. Competitor nations in Asia and Europe have gotten the message that skills matter, and they are catching up. Concerted international efforts—and marked success—at improving education and 21st century skills mean that the United States is no longer unrivaled in producing highly qualified, nimble, and ambitious workers for the new economy. In addition, the substantial economic growth fueled by information technology since the late 1980s and early 1990s is likely to max out without investment in intangible workforce assets, including ideas, knowledge, and talent (van Ark et al., 2009).

What Should a 21st Century Education Look Like?

Meeting the challenges we face requires a new model for education—one in which every aspect of our education system is aligned to prepare Americans to compete.

The Partnership for 21st Century Skills has spent the better part of a decade developing a robust Framework for 21st Century Learning (shown on page xv in figure F.1) that responds to the changing demands young people face today. Sustained and enthusiastic support from leading education organizations, the business community, and policymakers—and reality checks with parents, frontline K–12 and postsecondary educators, and community organizations—have shaped this framework into a comprehensive, intentional, and purposeful vision for 21st century education (Trilling & Fadel, 2009).

The graphic is powerful because it communicates at a glance the integration of core academic subjects, 21st century themes, and 21st century skills, with the educational support systems clearly aligned to these student outcomes. The Framework for 21st Century Learning offers a compelling, responsive, and viable direction for public education—starting now—for a number of reasons.

The Framework Focuses on Results That Matter

A 21st century education must be tied to *outcomes*, in terms of proficiency in core subject knowledge and 21st century skills that are expected and highly valued in school, work, and community settings. It is a national travesty that a majority of U.S. students leave high school without the core competencies that employers and postsecondary educators cite as the most critical for real-world performance and advanced learning. Critical thinking, problem solving, creativity, and the other 21st century skills are the tools people need to move up the economic ladder.

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With 21st century skills, students will be prepared to think, learn, work, solve problems, communicate, collaborate, and contribute effectively throughout their lives. Some say these kinds of skills are not unique to the 21st century. This is true. We call them out for three reasons.

First, these skills are rarely incorporated deliberately throughout the curriculum, nor are they routinely assessed. This status quo relegates these skills into the "nice to have" rather than the "must have" domain in education, which means they are taught unevenly. It is more likely that young people pick up these skills by chance in everyday living and job experiences and, yes, sometimes in school—if they are lucky enough to have good mentors or are astute enough to recognize and build these skills on their own. We simply can no longer afford to continue this haphazard approach to developing the most critical skills if we are to remain a competitive nation.

Second, these skills are essential for *all* students today, not just an elite few. In bygone economies, Americans lived in a hierarchical

world with an assembly-line mentality. Top managers and experts took on the lion's share of the thinking, problem solving, decision making, and communicating for their organizations. They gave orders, and most workers were expected simply to follow directions. This is not so today. Competitive organizations have flattened management structures, increased their use of technology, created more flexible work arrangements, and given greater responsibility to frontline workers and collaborative project teams. Such significant organizational and behavioral shifts have boosted productivity and innovation (Black & Lynch, 2004; Gera & Gu, 2004; Pilat, 2004; Zoghi, Mohr, & Meyer, 2007). With these realities, students who do not master 21st century skills will never fulfill their economic potentials.

In this flattened structure, every worker has more information and tools at his or her disposal—and much greater autonomy in using them. In exchange, workers are expected to be self-directed and responsible for managing their own work. As a manager at Apple told me, any employee who needs to be managed is no longer employable. The same shift of responsibility to individuals applies to personal life. There are fewer authority figures to take care of people or tell them what to do. Today, people have to manage their own health care, arming themselves with information, making choices about coverage, acting as their own advocates, and partnering with health-care providers to manage their health. Likewise, participating in civic life requires people to seek out information to understand issues on their own. The decline of print journalism, for example, means that the latest local news may not be delivered to the doorstep every day.

Third, the skills that employers and postsecondary educators say are required for success have converged. Even entry-level employees now are expected to use 21st century skills to accomplish their work (Casner-Lotto & Barrington, 2006; Conference Board, 2007; Lichtenberg, Woock, & Wright, 2008). Most jobs that pay a living wage today require at least some postsecondary education—and this is particularly the case for the 271 jobs with high-growth potential over the next ten years, according to the U.S. Department of Labor (Bureau of Labor Statistics, U.S. Department of Labor, 2008).

Most students aspire to college because they understand this. Indeed, there has been a significant increase in the proportion of the

labor force with at least some level of higher education (Carnevale & Desrochers, 2002). Twenty-first-century skills are equally important for successful transitions to college and workforce training programs. Among the components of college readiness presented by the Bill & Melinda Gates Foundation are "academic behaviors" and "contextual skills and awareness" (Conley, 2005, 2007), which reflect the kinds of skills captured in the Framework for 21st Century Learning. All students should be prepared with the skills they need to do well, whatever route they decide to take in the future.

The Framework for 21st Century Learning also incorporates several new 21st century themes that might not seem familiar. Again, employers and educators—along with parents, policymakers, and community advocates—identified these themes and skills as crucial. Typically, though, they are not emphasized in public education. These themes are grounded in everyday life as people across the United States are living it now. They want schools to integrate these new themes, which blend content and skills, to better prepare young people to thrive in a complex world.

For example, global awareness is a new essential in the global economy. Americans need a secure understanding of global issues that affect them as citizens and workers. They need to be able to learn from and work collaboratively with people from a range of diverse cultures and lifestyles. They need to be able to communicate in languages other than English.

Likewise, financial, economic, business, and entrepreneurial literacy are new imperatives. Guaranteed pensions are a rarity today, so the responsibility for retirement planning, saving, and investment management falls on individuals. Recent crises in the banking, credit, and mortgage industries—and the severe recession—underscore the importance of understanding how economic forces impact people's lives. Failure to make responsible financial choices could adversely affect individuals' quality of life for years. At work, people need to know how they fit in and contribute to a larger organization, and they need to bring an entrepreneurial mindset to their lives. By recognizing opportunities, risks, and rewards, they can enhance

their workplace productivity and career options and take changing circumstances in stride.

Finally, the Framework for 21st Century Learning articulates several skills that definitely break new ground, at least in education: creativity and innovation, flexibility and adaptability, leadership and cross-cultural skills—for *all* students. These are the kinds of skills that set people apart. Small leaps of imagination can result in tremendous personal and organizational advances. A willingness to respond positively to change leaves people open to new possibilities and more comfortable with the inevitable vagaries of life. Taking on leadership roles gives people more control over their lives, while cross-cultural skills strengthen their effectiveness in interacting with others they encounter in school, work, and the community.

These new skills also differentiate leading from lagging organizations and nations. They undergird every aspect of competitiveness: ingenuity, agility, and continuous improvement; the capacity to turn bold ideas into innovative products, services, and solutions; and the ability to champion worthwhile endeavors, overcome obstacles, and bridge cultural divides.

Taken together, the combination of core academic subjects, 21st century themes, and 21st century skills redefines rigor for our times. Many Americans have been advocating a more rigorous education to prepare students for college and career readiness—a position that we share.

However, *rigor* traditionally is equated with mastery of content (core subjects) alone, and that's simply not good enough anymore. Knowledge and information change constantly. Students need *both* content knowledge *and* skills to apply and transform their knowledge for useful and creative purposes and to keep learning as content and circumstances change.

I've heard John Bransford, a noted professor of education and psychology at the University of Washington and the coauthor of *How People Learn: Bridging Research and Practice* (2000) and *How Students Learn: Science in the Classroom* (2004), put it this way: In the United States, we tell students the same thing a hundred times.

On the 101st time, we ask them if they remember what we told them the first hundred times. However, in the 21st century, the true test of rigor is for students to be able to look at material they've never seen before and know what to do with it.

Infusing 21st century skills into core subjects actually ratchets up rigor. Recalling facts or terms from a textbook, or performing simple processes or procedures, places a low level of cognitive demand on students. Demonstrating deeper understanding through planning, using evidence, and abstract reasoning, for example, is more demanding. Making connections among related ideas within the content or among content areas, or devising an approach to solving a complex problem, requires extended thinking and even higher cognitive demand (Webb, 1997).

The connection between skills and rigor shows up on international assessments such as PISA. Students who can apply critical thinking and problem solving to math and science content perform better than those who cannot. In a 21st century education system, rigor must refer to mastery of content *and* skills.

As I see it, then, there are plenty of convincing indicators that proficiency in 21st century skills is the right result for our time. Enriching minds for the 21st century requires organizing the public education system around this goal.

The Framework Recognizes That Educational Support Systems—Especially Professional Learning Experiences—Are Vital

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While this might seem to be a monumental aspiration, the evidence suggests that states are prepared—even very willing—to take on this work. By October of 2009, fourteen states (Arizona, Illinois, Iowa, Kansas, Louisiana, Maine, Massachusetts, Nevada, New Jersey, North

Carolina, Ohio, South Dakota, West Virginia, and Wisconsin) had committed to retooling their standards and assessments, curriculum and instruction, professional development, and learning environments to support 21st century skills outcomes. The states and districts that are making real progress are those that take a holistic and systemic approach, articulating the skills they value and aligning every other part of their systems to move in this direction.

Many of these states face daunting challenges. Major industries are restructuring and eliminating jobs. The recent economic downturn has exacerbated this problem, and seriously affected state budgets and schools. Nevertheless, these states have carefully examined the framework and endorsed it as their model for building a 21st century education system. They realize that they must reinvent their education systems to renew their workforces and their economies. West Virginia, for example, is revising and refocusing its standards, assessments, instruction, professional development, teacher preparation, preK, and technology programs around the Partnership's Framework for 21st Century Learning.

Professional development is far and away the most important part of the work. Steve Paine, superintendent of schools in West Virginia, tells me that 80 percent of his efforts are devoted to improving teacher effectiveness in delivering 21st century instruction. He has it right. Articulating the skills that matter is only the first step. States and districts cannot assume that teachers can break out of the 20th-century box without sustained professional development. The West Virginia Department of Education has put a full-court press on this mission, initially training every teacher in the state during in-depth summer sessions on 21st century skills and in follow-up web-based coaching during the school year. The state also has a dynamic, interactive website, Teach 21, with a wealth of resources to assist teachers in their everyday classroom practices.

At the Partnership, we've developed detailed content maps and online resources that add layers of specificity to 21st century learning for teachers. These resources promote the kinds of hands-on, inquiry-based learning and development of higher-level thinking skills that the most effective teachers employ (Darling-Hammond et al., 2008). Indeed, many classroom teachers and educators who work closely

with students in schools are leading the way in delivering this kind of instruction. All of the teaching resources are available at a dedicated website: Route 21 (www.21stcenturyskills.org/route21/).

The entire supporting infrastructure of education must be modernized to establish the conditions for 21st century teaching, learning, and outcomes. And, as we have learned from previous standards-setting initiatives, ignoring the infrastructure puts an undue burden on students. It is unfair and unproductive to expect students to meet new and higher expectations if the supporting infrastructure does not exist. To help states, districts, and schools move forward, we have developed and updated our MILE guide with implementation guidance and self-assessment tools (Partnership for 21st Century Skills, 2009b).

All of the critical elements of an education system contribute to 21st century skills outcomes, and they cannot be left to chance.

The Framework Resonates With Policymakers, Educators, the Business Community, Community Organizations, and Parents

Plenty of organizations have developed models for improving education. Not many have had the courage to vet their models with thousands of people from every walk of life. Our model of core subjects, 21st century themes, and 21st century skills has been put to this test.

We developed the framework in concert with our nearly forty membership organizations, including the National Education Association and its 3.2 million members. We took the framework on road tours, reaching out to policymakers, educators, business people, community organizations, and parents. We listened to their comments and strengthened the themes and skill sets. We surveyed business people and parents, who strongly agree that 21st century skills are vital for success today (Casner-Lotto & Barrington, 2006; Partnership for 21st Century Skills, 2007). They also believe by overwhelming margins that schools should teach 21st century skills. Their beliefs are based in reality—the expectations of workplaces, the demands of citizenship, and the challenges of life that they face

every day. We've been informed by the surveys and reports of other organizations, which confirm our findings.

This is not a small point. A major difference between 21st century skills advocacy and other improvement initiatives, such as the 1980s push to revamp education, is that the leaders of this movement include policymakers, educators, *and* the business community. We are speaking with a united voice. Together, we have taken the time to gauge the interest and attitudes of key stakeholders in public education. And we have strived to build broad-based support for our model from the top down and the bottom up. In many states, governors, leaders in state education agencies and state boards of education, local school boards, business people, community organizations, educators, parents, and the voting public are engaged and energized by our model.

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There is much more work to do to build public understanding nationwide—in every district, community, and family. Yet the support we already have, plus the accomplishments of our fourteen leadership states, gives us the opportunity to engage in a vigorous national conversation about new student outcomes for the 21st century—and to bring more supporters on board.

State, district, and school leaders and their communities will want to examine the changes their economies have experienced over the past twenty years. They'll want to think through the new skills students will need for the next twenty years and beyond. And once they articulate these new skills in their own words, they will be ready to align their education systems to make their vision a reality.

The Future of Learning

This book is another telltale sign that we've reached a tipping point in education. That so many notable minds are thinking hard about the future of learning is a signal that we just might be on the cusp of bold action.

At stake at this moment are the nation's competitiveness and all that goes along with it: a strong democracy, international leadership,

lasting prosperity, and better prospects for generations to come. It is as true today as ever in our history that the American people are the engine of economic growth. In this time, for this era, however, they need to be equipped with knowledge and skills to compete in the 21st century.

In meeting rooms and classrooms across the country, I have met thousands of people who are ready to take on this challenge. The broad public support for the Framework for 21st Century Learning suggests the strong potential for building political will for a 21st century education system. It is exciting that the framework has generated this kind of interest, but it is far too early to proclaim victory.

We need to move from consensus about the *vision* of 21st century learning to a thorough understanding of and commitment to the *outcomes* of 21st century learning.

We need to move from consensus about the *vision* of 21st century learning to a thorough understanding of and commitment to the *outcomes* of 21st century learning. There is a danger, in fact, that a "21st century education" or "21st century skills" could mean anything. Many people equate technology-rich classrooms or modern schools or rigorous core subjects with 21st century learning, regardless of whether students are mastering 21st century skills. In reality, the ability to use digital devices in no way means that students know anything about global awareness or health literacy, learning and innovation skills, life and career skills, or even media literacy skills. Similarly, many educators claim that they already teach 21st century skills, even though these skills are not systemically infused into standards and assessments, curriculum and instruction, or professional development and learning environments.

The most important next step is to agree on outcomes in terms of proficiency in 21st century skills. And it's not enough to want these outcomes—it's essential to plan the entire education system intentionally and transparently around them. A great place to start is to use the lens of 21st century outcomes to aggressively pursue the ideas in this book.

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