The global economic crisis has increased the urgency for countries to identify new sources of growth and develop a sustainable path to economic success. Traditional reliance on natural resources is insufficient to support long-term growth. Only through entrepreneurship and innovation can countries enhance competitiveness, diversify their economies, and realize all the benefits of the rapidly expanding digital economy.

A strong governmental commitment to information and communication technology (ICT) is one of several critical elements needed to help accelerate entrepreneurship and innovation. Quantitative research, along with real-world examples from emerging and advanced nations, firmly establishes the social and economic benefits of ICT. These benefits include increases in the pace and quality of innovations, as well as macroeconomic benefits such as per-capita GDP growth, job creation, and rapid improvements in labor and total factor productivity.

Intel offers the experience and expertise to help countries develop a platform for growth. Through the Intel World Ahead program, Intel works with governments to engage local ecosystems that support entrepreneurship and lead to innovations that can improve lives and generate economic prosperity.
innovation continues to accelerate around
the world. To keep pace, countries need to
use technology to facilitate rapid develop-
ment and distribution of new products and
services to the global marketplace.

The benefits of innovation are undeniable. Inno-
vation helps governments operate
more efficiently, providing a higher level of
service and better use of taxpayer funds.
Citizens also benefit directly from social
and economic improvements driven by in-
novation. However, for countries to achieve
these benefits, they must act now, during
the current strategic inflection point.

**Innovation Leads to Growth**

As the Organization for Economic Co-
operation and Development (OECD) points
out, some countries are already tapping
into this growing global marketplace, and
leading the innovation economy. Innova-
tion is now the main driver of growth
in countries such as Finland and the United
Kingdom. And differences in multifactor
productivity—which is driven by innovation
and improvements in efficiency—
account for much of the overall gap be-
tween advanced and emerging countries.

Many emerging countries already
recognize the value of supporting
entrepreneurship and innovation,
as indicated by these examples:

- The number of companies from Brazil,
  Russia, India, or China on the Financial
  Times 500 list more than quadrupled
  from 2006 to 2008, from 15 to 62.
- Fortune 500 companies have 98
  research and development facilities
  in China and 63 in India.
- Huawei, a telecom company in China,
  applied for more international patents
  than any other firm in 2008.

"Information and communication
technologies draw societies
and cultures together; link and
hence strengthen all economies,
enterprises and individuals
around the world."

– Recep Tayyip Erdogan, Prime Minister
  of Turkey

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**Strategic Inflection Point Creates Opportunity**

Today, as recovery continues from one of
the worst economic downturns in history,
the world is in the midst of a strategic in-
flection point (see Figure 1). At this critical
moment, countries can choose to pull back,
redefine, and focus on old-world business
models, or they can choose to move for-
ward, invest in the future, and accelerate
entrepreneurship.

The current strategic inflection point has
arisen in part because economic global-
ization and advances in technology have
significantly increased market competi-
tiveness. Product life cycles are shorter,
production costs are lower, and market
demands change faster than ever before.

In this environment, innovation—the in-
roduction of a new or improved product,
process, or method—is essential to drive
growth, competitiveness, and employment.
Innovation has to be actively encouraged
and supported, in part because the pace of
innovation continues to accelerate around
the world. To keep pace, countries need to
use technology to facilitate rapid develop-
ment and distribution of new products and
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**Figure 1. Strategic inflection points describe critical moments at which rules and fundamentals change due to changes in technology, regulations, competition, and other factors.**
Evidence of the disparities in support for entrepreneurship and innovation can also be seen by looking at education and training. As shown in Figure 2, some countries—including many emerging countries—recognize the value of educating citizens about entrepreneurship. In these countries, more than a quarter of all citizens have been trained, in school or outside of school, about the basics of how to start a business. In other countries, only a handful of all citizens receive any such training.

Despite the benefits of building a platform for entrepreneurship and innovation, and the urgency to do so now, many governments remain tempted to focus on short-term, quick-return investments. A 2009 McKinsey survey of almost 500 large businesses worldwide indicated that 34 percent expected to spend less on research and development (R&D) in 2009 than in 2008, and only 21 percent forecast an increase. In 2010, a follow-up McKinsey report noted that executives now worry that reducing R&D the previous year may have “painful consequences,” including a weaker talent pool and a loss of market share due to shrinkage in new-product pipelines.

The OECD emphasizes the hazards of cutting spending on R&D and other investments that support innovation, stating, “Cutting back public investment in support of innovation may provide short-term fiscal relief, but will damage the foundations of long-term growth.”

Countries that fail to take advantage of current opportunities risk being left behind. Governments need to commit to innovation-related investments, including ICT, education/training, and R&D. These investments are not an alternative to mainstream development goals. Rather, they are vital to the development of the core infrastructure and future of every country.

“Entrepreneurs embody the promise of America: the idea that if you have a good idea and are willing to work hard and see it through, you can succeed in this country. And in fulfilling this promise, entrepreneurs also play a critical role in expanding our economy and creating jobs.”

– U.S. President Barack Obama, Jan. 31, 2011

Figure 2. Percentage of the population aged 18-64 years old who received any type of training in starting a business, during, or after school in 2008.
Additional studies have found that emerging countries with stronger ICT infrastructures attract significantly more business from off shoring, outsourcing, and foreign investment. ICT has also been found to improve enterprise performance in emerging countries by increasing sales, employment, profitability, and labor and total factor productivity.

Broadband Internet access and mobile telephony are two of the most beneficial elements of ICT. A recent World Bank study of 120 countries found that every increase of 10 percentage points in the penetration of mobile phones in emerging countries increases economic growth by 0.8 percentage points. The economic impact in emerging countries is, in fact, much higher than in advanced countries (see Figure 4).

The impact of broadband Internet access is equally powerful. For every percentage point increase of broadband penetration at the state level, employment increases by 0.2 percent to 0.3 percent per year. In rural and low-income areas, broadband access has been shown to dramatically increase productivity and contribute to income diversification, rural nonagricultural employment, and higher incomes for agricultural jobs.

Many of the world’s fastest growing countries—including Brazil, Russia, India, China, and Indonesia—are rapidly connecting their citizens to the Internet. Already, the Boston Consulting Group reports that these “BRICI” countries have 610 million Internet users, a number that is expected to nearly double by 2015.

“ICT has been a key component of Korea’s transformation into a leading global economy. Following the recent global economic downturn, Korea was the first country among OECD nations to achieve economic recovery. The ICT industry has been instrumental in the bounce-back.”

– Mr. Dae-Hoon Kim, FKII Chairman

Figure 3. IDI and GNI per capita, 2008.

Figure 4. Effect of a 10 percent increase in technology penetration on per capita GDP growth.
Effect of ICT on Entrepreneurship and Innovation

The value of ICT extends far beyond direct economic benefits. ICT is a driving force in the acceleration of entrepreneurship and innovation, making it easier to identify and develop good ideas, and create and disseminate new products and services.

In one survey of innovative enterprises in Europe, ICT enabled about half of all innovations introduced in recent years.17 Across the European Union, 32 percent of companies reported innovations, with IT enabling half of the product innovations and 75 percent of the process innovations.18

The pervasive use of ICT—including hardware, software, applications, and telecommunications—drives entrepreneurship and innovation in virtually every market sector, from farming to computing and government services. Some of the ways in which ICT supports entrepreneurship and innovation include:

• Increases interconnectedness and collaboration
• Allows smaller, entrepreneurial companies to compete in global markets
• Lowers the cost of entry for new entrepreneurs
• Facilitates research diversification and interdisciplinary approaches
• Enhances the ability of entrepreneurs to develop new business models, products, services, and processes
• Shortens product development cycles
• Provides new tools to create, organize, store, and transmit information
• Supports disruptive business models that transform industries
• Facilitates faster access to regional and international markets

Examples of Programs that Facilitate Entrepreneurship and Innovation

China: Technology Parks and Economic Development Zones

China has invested heavily in innovation, in part by supporting the creation of technology parks and economic development zones. The technology parks are focused on developing innovative technologies and services, including:

• Digital content creation
• Computer-aided engineering, design, and manufacturing
• Software development
• Cloud computing

As one example, China now has 17 national and more than 60 regional technology parks focused on creating digital content for video, TV, movies, and gaming. More than 8,000 small and medium businesses and 60,000 employees develop the content, which is intended for local as well as global consumption.

Regional governments provide a variety of incentives to encourage small and medium businesses, entrepreneurs, and others to move into the technology parks. These incentives include:

• Tax deductions
• Multi-billion RMB (Renminbi)-development fund
• Apprentice training
• Reduced-cost use of technology park facilities
• Equipment and financing

The central government provides additional rewards and promotions for outstanding product and technology breakthroughs.

THREE KEYS TO ENTREPRENEURSHIP AND INNOVATION

To build the foundation for sustained entrepreneurship and innovation, governments need to develop favorable policies and programs that support these important areas:

1) ICT. Entrepreneurs as well as national economies benefit from reliable and affordable access to broadband connectivity, localized software, technology services, and an IT infrastructure that supports ongoing innovations.

2) Education and training. Through traditional schools, workforce training, vocational schools, and related settings, youths and adults can receive training, and support to help them become successful entrepreneurs. Transforming education to integrate ICT, support entrepreneurship, and actively encourage improvements in science and technology can lead to long-term social and economic benefits.

3) R&D. The economic crisis provides a competitive advantage for enterprises and governments that continue to invest in R&D and in mechanisms that support the transfer and commercialization of R&D output into the private sector. The benefits of investing in R&D and having ready access to capital and financing is illustrated by businesses such as Google and Samsung Electronics, which greatly benefited from increasing their R&D expenditures during the IT bust of 2001.
France: Digital Passport Program
A vibrant small-business sector fosters an entrepreneurial culture, increases innovation, and generates jobs. To support the growth of this vital sector, the French government developed a nationwide program called the Passeport pour l’Économie Numérique (Passport to the Digital Economy).

Through the Passport program, businesses across France with fewer than 10 employees receive free training on the benefits of ICT and how to integrate technology into their businesses. Since 2007, the program has provided training to more than 170,000 small businesses and has helped the country increase its PC equipment rate (percentage of small businesses with one PC or more) from 72 percent to 98 percent.

The Passport program enhances the ability of small businesses to develop innovative new products, processes, and services. The program’s collaborative approach and success in influencing the hard-to-reach small-business sector also provides a sustainable model that is being exported to other countries around the world.


Portugal: Magellan Initiative
Just a few years ago, 95 percent of Portugal’s teachers had no laptop computer, household ICT penetration was just 1.34 percent, and the nation lagged other European Union countries in computer-to-student ratios. The government responded by creating the Magellan Project, which uses universal service fund subsidies and low-interest loans to make ICT more affordable.

Within two years, every school in Portugal was equipped with broadband Internet connectivity and every primary student received an Intel-powered classmate PC. The program successfully connected 79 percent of teachers to the Internet, and 50,000 teachers purchased laptop computers with built-in software designed specifically for them. The technology integration effort also spurred local PC manufacturing and is expected to result in a gain of 1,500 jobs and EUR 2.26 billion.20

Already, results are being seen in classrooms across Portugal. According to the OECD’s latest Programme for International Student Assessment (PISA) tests, from 2006 to 2009, Portuguese 15-year-olds made the biggest overall improvement in reading, math, and scientific skills compared with students from other developed countries. The tests showed Portuguese youth rose from near the bottom of global rankings to close to the OECD average for math and scientific literacy.21

Perhaps most importantly, Portugal is now developing a generation of young people—called the “Magellan generation”—who are learning to use the technology they need to become the entrepreneurs of tomorrow.

Plano Tecnologico: www.planotecnologico.pt

United States: Startup America
Startup America is a coordinated public-private effort designed to encourage and accelerate high-growth entrepreneurship throughout the U.S. The goals of the program are to:

• Expand access to capital for high-growth startups
• Expand entrepreneurship education and mentorship programs
• Strengthen commercialization of federally funded R&D
• Identify and remove unnecessary barriers to high-growth startups
• Expand collaborations between large companies and startups

Entrepreneurs, universities, foundations, and corporations are working together with a variety of federal agencies to support the program. As part of that effort, Intel Capital has joined Startup America’s board of advisors and pledged USD 200 million of new investments in American technology companies. IBM will invest an additional USD 150 million in 2011 to fund programs that promote entrepreneurs and new business opportunities in the U.S.

Startup America: www.whitehouse.gov/issues/startup-america
Intel Programs Support Entrepreneurship and Innovation
Intel offers a variety of programs that support the development of entrepreneurship and innovation.22 The programs focus on several key areas, including:

- Internet connectivity
- Research and development
- Affordability and financing
- Education and IT skills
- Awareness and promotion

Intel Programs Include:

Global Entrepreneurship Education Initiative**
The Global Entrepreneurship Education Initiative is a set of programs designed to build and support entrepreneurship worldwide. The initiative offers in-depth training and expertise to technology startup companies, along with tools to support the training and development of entrepreneurs. Intel is working with key global leaders on program creation and development. For example, the University of California at Berkeley is providing curriculum and other support. One activity—the Global Entrepreneurship Leadership Symposium—trains key education leaders to spread successful entrepreneurship methodologies.

Government PC Purchase Programs
Intel works closely with public and private leaders to develop government PC purchase programs. Two hundred purchase programs in more than 60 countries have given millions of citizens, students, and small-business entrepreneurs the opportunity to purchase the technology they need to succeed.

Intel AppUpSM Developer Program
This program encourages people to develop applications for distribution and sale to millions of current netbook users, and to future users of Intel® Atom™ processor-based devices. By supporting local content development, the program helps to address a critical need in many emerging markets.

Program participants can create new applications or post existing applications with the help of an easy-to-use software developers kit (SDK). The SDK includes support for multiple operating systems, runtimes, and stores. Software developers set their application price and keep up to 70% of the revenue.

Intel® Capital
Intel Capital invests in companies around the world, and offers entrepreneurs the opportunity to connect to industry experts and Global 2000 companies at the annual Intel Capital CEO Summit.

Intel Entrepreneurship Challenge*
The Intel Entrepreneurship Challenge is a global business plan contest focused on technology solutions. Participants must employ technology solutions to create their product. Regional business plan competitions culminate in a global competition held in partnership with the University of California at Berkeley.

"Help to create the right framework, so it’s easier for new companies to start up, for venture capital firms to invest, for innovations to flourish, for businesses to grow."

– David Cameron, Prime Minister of U.K.

Intel® Learn Technology and Entrepreneurship*
The Intel® Learn program extends learning opportunities beyond the classroom using an engaging, project-centered approach. The program helps students develop the 21st century skills they need to succeed in today’s knowledge economy. Using Internet tools and office applications, learners research and formulate a business idea, and then create and present a business plan for their idea.

Intel® Software Network
The Intel Software Network is an international online program that helps independent software vendors develop content and applications for Intel hardware and software products. The network encourages and supports technology innovation for local markets through online forums, free documentation, confidential online support, and more.

Intel® Teach
Intel is committed to transforming the lives of millions of young people by advancing education. One example of this commitment is Intel Teach, which has helped more than 9 million teachers in 70 countries learn to integrate technology into their classrooms.

Intel World Ahead Program
Intel collaborates with government leaders and other partners worldwide to connect the next billion people to a world of opportunity. Through hands-on expertise and resources, Intel World Ahead helps to develop comprehensive, long-term programs in education, healthcare, and other sectors. The programs are designed to support entrepreneurship and innovation, and improve lives, economies, and societies.

*Funded by the Intel Foundation.
**Jointly funded by Intel Corporation and the Intel Foundation.
The Path to Growth: Accelerating Entrepreneurship and Innovation Through ICT

Conclusion
It is crucial for governments to commit to entrepreneurship and innovation today. Investing in supportive programs in areas such as ICT, education/training, and R&D will enable countries to develop a blueprint for sustainable growth and increase the likelihood of future economic success. Contact your Intel representative to discuss opportunities to support and encourage entrepreneurship and innovation in your country.

LEARN MORE:

Intel® AppUp Developer Program: appdeveloper.intel.com
Intel Capital: www.intel.com/capital
Intel Entrepreneurship Challenge: www.entrepreneurshipchallenge.org
Intel® Learn: www.intel.com/education/learn
Intel® Software Network: software.intel.com
Intel® Teach: www.intel.com/education/teach
Intel World Ahead Program: www.intel.com/worldahead

1 Only the Paranoid Survive: How to Exploit the Crisis Points That Challenge Every Company, Andrew S. Grove, 1999.
4 Ibid.
7 Not all programs are available in all countries. Consult your local Intel representative to find out more.

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