

## A NATIONAL TECHNOLOGY AGENDA FOR THE NEW ADMINISTRATION

Robert D. Atkinson & Daniel D. Castro

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While the presidential race primarily focused on the economy, the Iraq war, and the rising cost of health care, President Barack Obama must now show that he is ready to set the technology policy agenda of the United States for the next four years because our national technology policy will have a large effect across all areas of national policy.

Spurring technological innovation is becoming an increasingly important tool for policymakers. Government has traditionally relied on three mechanisms to shape public policy: tax policy, government programs, and regulation. However, innovation has become an important component because success in many policy areas, including health care, national defense, homeland security, transportation, energy, environment, law enforcement, and, of course, the economy, may largely be determined by our ability to develop and deploy information technology (IT). For example, solving our nation's surface transportation challenges will be difficult without the widespread use of IT, whether to implement congestion pricing and tolling with intelligent transportation systems or to provide real-time information on traffic conditions. Likewise, fixing health care requires a massive infusion of IT, including the deployment of electronic health records and the creation of a sustainable national health information network.

This essay lays out a framework for the new administration's technology policy to help spur growth and progress throughout the economy and government. Each of these policy changes satisfies at least one of two primary goals: 1) promoting competitiveness and innovation; and 2) fostering a more robust digital economy. Given the importance of IT to solving pressing societal problems, it is crucial that the new administration see IT not as a sideline issue, but as a key component of its domestic and foreign policy. This means putting issues of digital transformation at the front and center of a wide array of public policy issues. For example, any economic stimulus package should invest not only in physical infrastructure, but also in our digital infrastructure. It also means that IT transformation needs to be a key component of every government agency, not just the commerce or telecommunications agencies.

### **Promote Competitiveness and Innovation**

In the last decade, an increasing number of economists have come to see technological innovation as the key to higher standards of living. The United States has led the world in innovation since World War II, yet there is disturbing evidence (e.g. declining shares of global patents, R&D, technology exports, etc.) that our lead is beginning to shrink and may well disappear.<sup>1</sup> To meet the economic challenges of the future and keep America competitive in the global economy, the new administration will need to make the promotion of innovation a key part of its economic agenda. The administration needs to establish robust policies that encourage innovation both on the supply side, by supporting science, technology, engineering, and mathematics (STEM) education and research, and on the demand side, by creating the conditions and incentives to spur more innovation.

### **Fight Mercantilist Trade Practices**

As Hedlund and Atkinson assert in *The Rise of the New Mercantilists: Unfair Trade Practices in the Innovation Economy*, the current debate over trade is characterized by laissez-faire Panglossian support on the one side and protectionist opposition on the other.<sup>2</sup> The new administration needs to chart a new course in trade policy that starts with recognizing that globalization will work effectively — producing the largest increase in wealth that benefits the most people — only if all nations play by the agreed-upon rules.

Unfortunately, as Hedlund and Atkinson argue, in the international competition for high-tech jobs, many countries have erected “a host of unfair and protectionist policies focused on systematically disadvantaging foreign and American companies in global competition.”<sup>3</sup> These policies include raising the relative price of foreign IT products and services through tariffs, taxes, subsidies, and excessive antitrust enforcement; acquiring foreign IT products and services through digital theft and the forced

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<sup>1</sup> STEPHEN EZELL & ROBERT ATKINSON, INFO. TECH. & INNOVATION FOUND., RAND'S ROSE-COLORED GLASSES: HOW RAND'S REPORT ON U.S. COMPETITIVENESS IN SCIENCE AND TECHNOLOGY GETS IT WRONG 1 (2008), available at <http://www.itif.org/files/2008-RAND%20Rose-Colored%20Glasses.pdf>.

<sup>2</sup> JULIE A. HEDLUND & ROBERT D. ATKINSON, INFO. TECH. & INNOVATION FOUND., THE RISE OF THE NEW MERCANTILISTS: UNFAIR TRADE PRACTICES IN THE INNOVATION ECONOMY (2007), available at <http://www.itif.org/files/ITMercantilism.pdf>.

<sup>3</sup> *Id.* at 1.

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release of intellectual property rights; and blocking or limiting access of foreign companies to markets through standards, government procurement, data privacy, and other policies.

The new administration should take active steps to combat these unfair trade practices. One strategy would be to appoint a U.S. Trade Representative who is focused on and capable of vigorously challenging violations of other nations' IT trade agreements under the World Trade Organization (WTO).<sup>4</sup> In addition, the administration should ask Congress for additional funds for the Office of the U.S. Trade Representative (USTR) to use to enforce existing trade commitments.

Even if Congress gives the USTR more resources, government alone cannot investigate all potential WTO cases. Companies that do bring cases to the WTO are acting on behalf of the U.S. government. To encourage companies to build these cases, the new administration should consider working with Congress to create a twenty-five percent tax credit for expenditures related to the cost of litigation.<sup>5</sup>

In addition, when WTO rules do not go far enough in limiting mercantilist actions, the new administration needs to make sure that market-based IT trade is a high priority when it negotiates bilateral trade agreements.<sup>6</sup>

### **Reform the U.S. Patent System**

As Hedlund illustrates in *Patents Pending: Patent Reform for the Innovation Economy*, the patent system provides key economic incentives for innovation.<sup>7</sup> But in recent years it has been beset by a number of problems that the new administration will need to tackle if Congress does not enact patent reform legislation this year. There are three main problems with the current patent system.<sup>8</sup> First, the U.S. Patent and Trademark Office (PTO) lacks sufficient resources to efficiently process patent applications, with some applicants waiting up to four years to

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<sup>4</sup> *Id.* at 2.

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> JULIE A. HEDLUND, INFO. TECH. & INNOVATION FOUND., *PATENTS PENDING: PATENT REFORM FOR THE INNOVATION ECONOMY* (2007), *available at* <http://www.itif.org/files/PatentsPending.pdf> [hereinafter PATENTS PENDING].

<sup>8</sup> *Id.* at 1.

receive their patents.<sup>9</sup> Fee diversion has contributed to the backlog by constraining the PTO's budget and preventing it from hiring sufficient examiners to keep up with demand.<sup>10</sup> Second, the quality of many patents issued by the PTO has been poor. As Hedlund notes, "[l]ack of sufficient PTO resources has contributed to patent examiners granting questionable patents that are overly broad and overlap with existing patents."<sup>11</sup> For example, Hedlund found that "examiners have only as much time to review patent applications as they had in the 1970s, even though the technology being patented is much more complex."<sup>12</sup> Third, as Hedlund argues, the amount of litigation in the United States has increased greatly, placing a significant strain on the U.S. innovation system.<sup>13</sup> In fact, "[p]atent litigation increased 120 percent between 1990 and 2005 (while civil litigation in general rose just 5 percent) . . . [and] damage awards have grown, providing windfalls to some patent holders at the expense of consumers who must pay higher prices for goods and services."<sup>14</sup>

There are many steps the administration should take, including working with Congress to grant the PTO regulatory authority to increase its fees to meet its budgetary needs. Increasing fees would enable the PTO to hire additional examiners, provide examiners more time to search for and evaluate prior art, and make other improvements to patent processing, such as running and expanding the Accelerated Review Option and the Community Patent Review Project. Both of these programs provide applicants incentives to submit relevant statements of prior art.<sup>15</sup>

Another important step is to work with Congress to create a post-grant opposition process to be conducted by the PTO that

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<sup>9</sup> *Id.* at 1; *see also* U.S. PAT. & TRADEMARK OFF., STRATEGIC PLAN 2007-2012: OTHER ACCOMPANYING INFORMATION (2006), [http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012\\_10.htm](http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012_10.htm).

<sup>10</sup> PATENTS PENDING, *supra* note 7, at 6; A PATENT SYSTEM FOR THE 21<sup>ST</sup> CENTURY, NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES 45-46 (Stephen A. Merrill, Richard P. Levin, & Mark B. Myers eds., 2004).

<sup>11</sup> PATENTS PENDING, *supra* note 7, at 1.

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*; *see also* Patstats.org, Patent Suits and Other Civil Actions, Over Time, [http://www.patstats.org/Historical\\_Filings\\_PatentSuits\\_OtherSuits.doc](http://www.patstats.org/Historical_Filings_PatentSuits_OtherSuits.doc) (last visited Jan. 2, 2009).

<sup>15</sup> PATENTS PENDING, *supra* note 7, at 2.

allows any party to challenge a patent's validity twelve months after it is issued, and at any time during the life of the patent, if the patentee sues the challenger for infringement. Such a change to the *inter partes* reexamination process could encourage patent challengers to participate in the patent review process while eliminating the risk to patent holders of excessive harassment after the twelve month review window has passed.<sup>16</sup>

In addition, the administration should work with Congress to "require the courts to determine actual damages based on the economic value of the patent's specific contribution over the prior art."<sup>17</sup> This change would let patent owners obtain appropriate damage awards in cases where a defendant infringed a patented component that was fundamental to the commercial success of the defendant's product.<sup>18</sup>

Finally, the administration should work with Congress to adopt a first-inventor-to-file system. For the inventor, "first-to-invent" systems are fraught with much uncertainty both during the application process and after an examiner grants a patent.<sup>19</sup> A "first-inventor-to-file" system would eliminate this uncertainty.

### **Expand STEM Education**

In an earlier work, Atkinson argued that "if America is to succeed in the innovation-powered global economy, boosting math and science skills will be critical."<sup>20</sup> The United States now lags behind much of the world in the share of its college graduates majoring in science and technology. In fact, our international rankings are dismal with the United States coming in "29th out of 109 countries in the percentage of 24 year olds with a math or science degree."<sup>21</sup>

Unfortunately the percentage of American students earning degrees in the science, technology, engineering, and mathematics (STEM) fields continues to decline even as our economy becomes more dependent on technological innovation. Consider that in 2003

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<sup>16</sup> *Id.* at 11.

<sup>17</sup> *Id.* at 18.

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> ROBERT D. ATKINSON ET AL., INFO. TECH. & INNOVATION FOUND., ADDRESSING THE STEM CHALLENGE BY EXPANDING SPECIALTY MATH AND SCIENCE HIGH SCHOOLS 1 (2007), available at <http://www.itif.org/files/STEM.pdf> [hereinafter ADDRESSING THE STEM CHALLENGE].

<sup>21</sup> *Id.*

the percentage of doctoral degrees earned by foreign-born students in the United States reached fifty percent for mathematics and computer science, and sixty percent for engineering fields.<sup>22</sup> As a result, the “number of engineering doctorates awarded by U.S. universities to U.S. citizens dropped by 23 percent in the past decade” and the “U.S. share of the global output of doctorates in science and engineering declined from 52 percent in 1986 to 22 percent in 2003.”<sup>23</sup> Perhaps even more troubling is that fewer of these foreign students are choosing to stay in the United States after they graduate, further weakening America’s technological leadership.<sup>24</sup>

While various proposals exist to address this challenge, one opportunity is to expand the number of specialty math and science high schools in the United States. Graduates of these schools have been found to pursue undergraduate and graduate degrees in STEM fields in greater numbers.<sup>25</sup> As Atkinson proposed in a previous article, the new administration should push Congress to “allocate \$180 million a year for five years to the National Science Foundation to be matched by states and local school districts and industry with the goal of tripling enrollment in math and science high schools to 140,000 by 2012.”<sup>26</sup> These funds would be used to build new specialty math and science high schools, rehabilitate existing schools, and purchase new laboratory equipment.

### **Expand the Research and Experimentation Tax Credit**

As Atkinson has argued in a previous article, if the United States is to succeed, the new administration also needs an active technology policy to ensure that companies keep research and development (R&D), commercialization, and production within the United States.<sup>27</sup>

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<sup>22</sup> NATIONAL SCIENCE FOUNDATION, SCIENCE AND ENGINEERING INDICATORS 2006 app. tbl.2-48 at A2-129 (2006), available at <http://www.nsf.gov/statistics/seind06/append/c2/at02-48.pdf>.

<sup>23</sup> NORMAN AUGUSTINE, IS AMERICA FALLING OFF THE FLAT EARTH? 43 (2006).

<sup>24</sup> See, e.g., ANNALEE SAXENIAN, THE NEW ARGONAUTS: REGIONAL ADVANTAGE IN THE GLOBAL ECONOMY 274-76 (2006).

<sup>25</sup> ADDRESSING THE STEM CHALLENGE, *supra* note 20, at 6-7.

<sup>26</sup> *Id.* at 1.

<sup>27</sup> Robert D. Atkinson, *Expanding the R&E Tax Credit to Drive Innovation, Competitiveness and Prosperity*, 32 J. TECH. TRANSFER 617, 625 (2007), available at <http://www.itif.org/files/AtkinsonRETaxCreditJTT.pdf> [hereinafter *Expanding the R&E Tax Credit*].

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The first place to start is expanding the R&D tax credit. Countries throughout Southeast Asia and Europe have put innovation at the center of their national economic strategy, aggressively using R&D tax incentives as a cornerstone of those strategies. One reason for this focus on R&D tax incentives is that there is now a clear consensus in the scholarly literature on the effectiveness of R&D tax incentives.<sup>28</sup> For example, in 1995, Bronwyn Hall found that the tax credit produced a dollar increase in reported R&D spending for every dollar lost in tax revenue, and that between 1981 and 1991, a more generous tax credit led to even greater investment in R&D.<sup>29</sup>

However, the United States no longer provides the same generous tax treatment of R&D that it had in the late 1980s. A 2005 comparison of nations in the Organization for Economic Cooperation and Development (OECD) found that the United States had fallen to seventeenth in R&D tax treatment of large companies.<sup>30</sup> As a result, the ratio of R&D conducted abroad versus at home has fallen. Between 1998 and 2003, “the share of U.S. corporate R&D sites located within the United States has declined from 59 percent to 52 percent, while the share of U.S. corporations’ R&D sites located in China and India have increased from 8 to 18 percent.”<sup>31</sup>

Expanding the Research and Experimentation Tax Credit<sup>32</sup> would help make the United States a more attractive location for internationally mobile R&D and lead to generally greater R&D investments in the United States and more economic growth.<sup>33</sup>

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<sup>28</sup> ROBERT D. ATKINSON, INFO. TECH. & INNOVATION FOUND., THE RESEARCH AND EXPERIMENTATION TAX CREDIT: A CRITICAL POLICY TOOL FOR BOOSTING RESEARCH AND ENHANCING U.S. ECONOMIC COMPETITIVENESS (2006), available at [www.itif.org/files/R&DTaxCredit.pdf](http://www.itif.org/files/R&DTaxCredit.pdf) [hereinafter RESEARCH AND EXPERIMENTATION TAX CREDIT].

<sup>29</sup> *Id.* at 2.

<sup>30</sup> *Id.* at 2; Jacek Warda, *Tax Treatment of Investment in Intellectual Assets: An International Comparison* 16 (Org. for Econ. Co-operation & Dev. Sci., Tech. & Indus. Working Papers, Paper No. 4, 2006).

<sup>31</sup> EZELL & ATKINSON, *supra* note 1, at 8.

<sup>32</sup> Referred to in this essay as the R&D tax credit.

<sup>33</sup> See, e.g., Dominique Guellec & Bruno van Pottelsberghe de la Potterie, *The Impact of Public R&D Expenditures on Business R&D*, 12(3) ECON. INNOVATION & NEW TECH. 225 (2003); Kenneth J. Klassen, Jeffrey A. Pittman, & Margaret P. Reed, *A Cross-national Comparison of R&D Expenditure Decisions: Tax Incentives and Financial Constraints*, 21 CONTEMP. ACCT. RES. 639 (2004).

The new administration should also work with Congress to make the credit permanent. In virtually all nations except the United States, R&D tax incentives are permanent features of the tax code. Since its enactment in 1981, the R&D tax credit has been extended twelve times and expired twice, including in 2006. However, uncertainty over the credit's continuity adds risk to companies making research investments which typically span multiple years. An OECD study found that the less stable and more uncertain the credit, the less likely it is to have a positive effect on stimulating R&D.<sup>34</sup>

In addition, with many international competitors providing significantly more generous tax treatment of research investments, the United States should increase its R&D credit to remain competitive. Firms investing in R&D can use one of two tax credits: the regular incremental credit or the flat Alternative Simplified Credit (ASC). First, the administration should double the rate for the regular credit from twenty percent to forty percent, in turn, making an important statement about its commitment to keeping and growing research-based economic activities. Second, the administration should encourage Congress to expand the ASC, which currently provides a tax credit of only fourteen percent. The ASC should be expanded to a three-tier credit, with a credit of fourteen percent for expenditures above fifty percent of base period expenditures but below seventy-five percent; a credit of twenty percent for expenditures above seventy-five percent of base period expenditures but below one hundred percent; a credit of forty percent on expenditures above one hundred percent of base period.<sup>35</sup>

Furthermore, the administration should work with Congress to create a forty percent flat credit for collaborative R&D. As Atkinson explains, firms increasingly use collaborative research “to lower the costs of research and increase their effectiveness by maximizing idea flow and creativity.”<sup>36</sup> Collaborative research can include partnerships with other firms, universities, federally funded laboratories, or an industry consortium. These types of collaborative research partnerships allow firms to maximize the impact of their R&D expenditures, increase their productivity, and benefit from developing new channels for learning and discovery.<sup>37</sup> Since much of the research from these partnerships is

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<sup>34</sup> Guellec & van Pottelsberghe de la Potterie, *supra* note 33, at 236.

<sup>35</sup> See *Expanding the R&E Tax Credit*, *supra* note 27, at 9.

<sup>36</sup> RESEARCH AND EXPERIMENTATION TAX CREDIT, *supra* note 28, at 625-26.

<sup>37</sup> Cf. Lee Branstetter & Mariko Sakakibara, *Japanese Research Consortia: A Microeconomic Analysis of Industrial Policy*, 46 J. INDUS. ECON. 207 (1998).

disseminated publicly via scientific publications, many of the benefits of the research do not flow directly to the firms investing in it. Because of these network externalities, firms will tend to under-invest in this type of collaborative research. In fact, as Atkinson argues, “this risk of underinvestment is particularly true as the economy has become more competitive, and a reflection of this is the fact that for the first time since the data were collected in 1953 the percentage of US [sic] academic R&D supported by industry has declined in each of the last 5 years.”<sup>38</sup> To spur more collaborative R&D, the administration should support a flat credit of forty percent for collaborative research conducted at universities, federal laboratories, and research consortia.

### **Let Companies Expense Investment in IT Equipment and Software in the First Year**

While innovation is important, it must be supported by strong investment. Research has conclusively shown that innovation, and in particular IT innovations, powers growth.<sup>39</sup> For example, Atkinson found that “IT seems to be ‘super capital’ that has a much larger impact on productivity than other capital.”<sup>40</sup> It is, therefore, important for the new administration to adopt policies that will spur new investment in innovative technology. One key way to do this is to let companies depreciate IT investments for tax purposes. Currently, new IT equipment and software must be depreciated over several years. Allowing companies to write off all the costs for tax purposes in the first year would raise the rate of return of new equipment, spurring companies to invest more, rapidly turning over older, less productive equipment and software. By lowering the cost of equipment, these incentives encourage more investment by helping companies turn the corner of

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<sup>38</sup> RESEARCH AND EXPERIMENTATION TAX CREDIT, *supra* note 28, at 626. According to NSF, industrial R&D support to U.S. universities and colleges in current dollars reached its peak in 2001 and has declined every year since then (to 2004). The share of academic R&D provided by industry peaked in 1999 and has declined every year since. Alan I. Rapoport, Nat’l Sci. Found., *Where Has the Money Gone? Declining Industrial Support of Academic R&D*, INFOBRIEF, Sept. 2006, at 1, available at <http://www.nsf.gov/statistics/infbrief/nsf06328/nsf06328.pdf>.

<sup>39</sup> ROBERT D. ATKINSON & ANDREW S. MCKAY, INFO. TECH. & INNOVATION FOUND., *DIGITAL PROSPERITY: UNDERSTANDING THE ECONOMIC BENEFITS OF THE INFORMATION TECHNOLOGY REVOLUTION 7* (2007), available at [http://www.itif.org/files/digital\\_prosperity.pdf](http://www.itif.org/files/digital_prosperity.pdf).

<sup>40</sup> ROBERT D. ATKINSON, INFO. TECH. & INNOVATION FOUND., *BOOSTING EUROPEAN PROSPERITY THROUGH THE WIDESPREAD USE OF ICT 10* (2007), available at <http://www.itif.org/files/EuropeanProductivity.pdf>.

profitability earlier than they otherwise would.<sup>41</sup> Such incentives would change the cost-benefit considerations in replacing old, but still usable equipment, with newer, productivity-enhancing equipment that might be safer and more environmentally-friendly. In addition, these incentives make companies in the United States more competitive with companies in other nations.

### **Establish a National Innovation Foundation**

One of the most striking limitations to U.S. technology policy is the lack of a centralized agency charged with overseeing and spurring commercial innovation in the economy. In contrast, most other developed nations have established national innovation agencies to help the private sector commercialize innovations. To help spur innovation, the new administration should work with Congress to create a National Innovation Foundation (NIF) to help domestic firms, except those involved in farming, become more innovative and competitive.<sup>42</sup> Atkinson and Wial, who originally proposed the NIF, describe the benefits as follows:

[The National Innovation Foundation] would achieve this goal by assisting firms with such activities as joint industry-university research partnerships, technology transfer from laboratories to businesses, technology-based entrepreneurship, industrial modernization through adoption of best practice technologies and business practices, and incumbent worker training. By making innovation its mission, funding it adequately, and focusing on the full range of firms' innovation needs, NIF would be a natural next step in advancing the innovation agenda that Congress put in place when it passed the America COMPETES Act.<sup>43</sup>

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<sup>41</sup> F.M. SCHERER, NEW PERSPECTIVES ON ECONOMIC GROWTH AND TECHNOLOGICAL INNOVATION 85 (1999).

<sup>42</sup> Because the problems of agricultural innovation are quite different from those of other industries and because the Department of Agriculture already addresses them, through various programs including the Cooperative State Research, Education, and Extension Service, the NIF would not deal with innovation in farming.

<sup>43</sup> ROBERT D. ATKINSON & HOWARD WIAL, INFO. TECH. & INNOVATION FOUND., BOOSTING PRODUCTIVITY, INNOVATION, AND GROWTH THROUGH A NATIONAL INNOVATION FOUNDATION 27-28 (2008), available at <http://www.itif.org/files/NIF.pdf>.

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Absent from the NIF agenda would be activities in patents, basic scientific research, and education in science, technology, engineering, and mathematics; these activities are best left to other government agencies because the expertise needed differs greatly from the knowledge and skills needed to help firms innovate. The NIF could be funded from a variety of sources and could be organized as part of the Commerce Department, as an independent federal agency, or as a government-related nonprofit organization.

The NIF would engage in the following major kinds of activities:

- Fund national-level sector-based research initiatives, replacing and expanding on the Technology Innovation Program (TIP) and the National Science Foundation's (NSF) activities in this area.<sup>44</sup>
- Fund regional technology based economic development activities through partnerships with states, replacing and expanding on other TIP and NSF activities but with an explicit focus on states.
- Promote technology diffusion in lagging industries and among small- and medium-sized enterprises, replacing and expanding on the Manufacturing Extension Partnership.<sup>45</sup>
- Administer grants to help develop regional industry clusters.
- Improve the measurement of and conduct research on innovation.<sup>46</sup>
- Advocate for innovation and innovation policy.<sup>47</sup>

### **Foster a More Robust Digital Economy**

In our global economy, IT is a major driver, not just of economic growth, but also of improved quality of life. Indeed solutions to many of the pressing social challenges facing our nation, from implementing electronic health records to controlling the rising cost of health care to using digital transformation to move to a less carbon-intensive economy rely on IT. To ensure that the United States continues to benefit from IT-driven economic growth and productivity, the new administration should continue to invest in IT infrastructure and support policies that foster a more robust digital economy and society.

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<sup>44</sup> *Id.* at 29.

<sup>45</sup> *Id.* at 50.

<sup>46</sup> *Id.* at 29.

<sup>47</sup> *Id.* at 37.

### **Reinvigorate U.S. Leadership in E-Government**

The United States also trails other nations in certain high-profile e-government initiatives, such as the development of an online census and the development of a trusted platform for electronic voting.<sup>48</sup> The new administration should be prepared to lead a radical transformation in e-government. This transformation should have two goals: establishing the ubiquitous use of technology in government and creating functionally-oriented, citizen-centered e-government applications.

The new administration should focus on making the use of IT ubiquitous in government and industry. Government should lead by example by leveraging its own information technology efforts to achieve more effective and productive public sector management and administration. Among other things, this means government should not only actively promote e-government but should also look to how IT can be used help solve a wide array of pressing public challenges in the education, energy, transportation, and public safety arenas.

To help achieve this goal of e-transformation, the new administration should work with Congress to create a federal CIO, or what President Obama has called the Chief Technology Officer (CTO). The CIO would have strong executive level support so as to be an effective catalyst for inter-organizational cooperation and exchange across departments and agencies. However, the CIO needs to do more than just plan and set priorities — the CIO needs to have the power to make decisions when something more than collaboration and consensus is needed. Top priorities for the CIO should include taking the lead in shaping the administration's policy regarding the Internet, overseeing issues of computer and network security for the government, and working with state and local governments to promote digital government.

The administration also needs to take advantage of the power of information technology to simplify and streamline interactions with government by establishing better information portals. It often makes sense to organize information by function rather than by government agency or jurisdiction. This means developing subject-specific portals that address the needs of

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<sup>48</sup> See DANIEL CASTRO, INFO. TECH. & INNOVATION FOUND., E-CENSUS UNPLUGGED: WHY AMERICANS SHOULD BE ABLE TO COMPLETE THE CENSUS ONLINE 4-5 (2008), *available at* <http://www.itif.org/files/eCensusUnplugged.pdf>; DANIEL CASTRO, INFO. TECH. & INNOVATION FOUND., STOP THE PRESSES: HOW PAPER TRAILS FAIL TO SECURE E-VOTING 1-2 (2007), *available at* <http://www.itif.org/files/evoting.pdf>.

citizens, businesses, and other government entities.<sup>49</sup> In many cases the government might simply partner with other organizations — networks of companies, universities, nonprofit organizations, churches, and other civic groups — to provide cross-jurisdictional applications that meet customer demand. The challenge is not technology; the tools exist today to make interacting with government relatively easy. The problem is that government agencies and legislatures have been slow to adopt or have even resisted taking the next steps to harness IT to create a more customer-focused government.

### **Establish a National Broadband Policy**

As Atkinson, Correa and Hedlund have described in a previous report, a national broadband policy should be a fundamental component of the new administration's IT policy agenda.<sup>50</sup> High speed broadband Internet access is a fundamental part of the infrastructure on which our digital economy is built and enables many innovative application and services fundamental to our quality of life. Unfortunately, various international rankings of broadband adoption show the United States falling behind. According to the latest OECD statistics, the United States ranks fifteenth among thirty OECD nations on a subscribers per-capita basis, down from fourth in 2001.<sup>51</sup> And Atkinson, Correa, and Hedlund found that even with a more comprehensive measure of the share of households subscribing to broadband, average broadband speed, and broadband prices, the United States still ranks fifteenth.<sup>52</sup>

A national broadband policy would encourage both supply and demand. On the supply side, government incentives could be crafted to spur additional investment in broadband networks, both to upgrade existing networks and improve access in underserved areas.<sup>53</sup> On the demand side, a national broadband policy could increase access to personal computers, improve digital literacy, increase the use of the Internet in education, and spur the

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<sup>49</sup> ROBERT D. ATKINSON, INFO. TECH. & INNOVATION FOUND., *TURBO GOVERNMENT: A BOLD NEW VISION FOR E-GOVERNMENT 2* (2006), available at <http://www.itif.org/files/turbogov.pdf>.

<sup>50</sup> ROBERT D. ATKINSON, DANIEL K. CORREA & JULIE A. HEDLUND, INFO. TECH. & INNOVATION FOUND., *EXPLAINING INTERNATIONAL BROADBAND LEADERSHIP* (2008), available at <http://www.itif.org/files/ExplainingBBLeadership.pdf>.

<sup>51</sup> *Id.* at 5.

<sup>52</sup> *Id.* at 5, 9.

<sup>53</sup> *Id.* at 22-37.

development of innovative e-government applications requiring high-speed Internet access.<sup>54</sup>

One specific step for the new administration is to support Congressional efforts to create tax incentives for investments in broadband networks, such as accelerated depreciation for capital investments in network infrastructure or maintaining the existing Internet tax moratorium.<sup>55</sup> A strong federal role is needed to support broadband investment, in part, because investment in broadband generates considerable positive network externalities that accrue not just to the individual consumer, but also to society as a whole.<sup>56</sup> Market forces alone will not generate the socially optimal level of broadband, at least for the foreseeable future.<sup>57</sup>

However, the administration should refrain from dictating which technologies (e.g. fiber, DSL, cable) network operators should use to provide broadband Internet access. In addition, the administration should push Congress to make more of the wireless spectrum available for next-generation wireless data networks.

The administration should also work with Congress to increase financial support for rural broadband where it is more expensive to deploy. One way this could be accomplished is to expand the federal Universal Service Fund program to fund access to broadband in rural areas and make all carriers, not just rural carriers, eligible to participate. In addition, the administration could support expanding the Rural Utilities Service Broadband Program to support non-satellite broadband Internet access.

The United States should also support state and local programs that aggregate demand for broadband services by co-funding state-level broadband support programs, like E-North Carolina and ConnectKentucky. For example, ConnectKentucky, a public-private partnership to accelerate technological growth within the state, has seen broadband availability and adoption rates increase substantially since its inception. Moreover, the organization does more than just promote broadband availability, it also offers programs to spur adoption by, for example, working to increase digital literacy and computer ownership.<sup>58</sup> The new

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<sup>54</sup> *Id.* at 37-40.

<sup>55</sup> *Id.* at 44.

<sup>56</sup> ROBERT D. ATKINSON, INFO. TECH. & INNOVATION FOUND., THE CASE FOR A NATIONAL BROADBAND POLICY 1 (2007), available at <http://www.itif.org/files/CaseForNationalBroadbandPolicy.pdf>.

<sup>57</sup> *Id.*

<sup>58</sup> See ConnectKentucky.org, Message from Our Steering Committee Chairman, [http://www.connectkentucky.org/about\\_us/Message\\_from\\_Our\\_Steering\\_Committee\\_Chairman.php](http://www.connectkentucky.org/about_us/Message_from_Our_Steering_Committee_Chairman.php) (last visited Dec. 28, 2008) (“More impressive than the

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administration should push for local programs that not only support broadband connectivity, but also work to raise local levels of digital literacy and computer access.<sup>59</sup>

More compelling public-interest broadband applications will also play a role in encouraging broadband adoption. To achieve this goal, the administration should encourage Congress to fund a revitalized Technology Opportunities Program (TOP). In general, TOP grants helped “state, local and tribal governments, health care providers, schools, libraries, police departments, and community-based nonprofit organizations” build and deliver technology capability to local residents.<sup>60</sup> In the past, many of the projects funded by TOP had limited use outside of a particular community. One way for the new administration to improve TOP would be to focus on developing scalable or reusable applications that could serve many communities or groups.

### **Spur Health IT**

With health expenditures of \$2.1 trillion in 2006,<sup>61</sup> the United States spends more on health care than any other nation as a percentage of GDP.<sup>62</sup> Yet for all this spending, in 2000, the World Health Organization ranked the health care system in United States as thirty-seventh in overall performance.<sup>63</sup> As Castro has argued in

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positive publicity generated by ConnectKentucky are the non-profit group’s results that have sparked a technology and economic development turn-around for the Commonwealth. ConnectKentucky connects people to technology in a way that helps improve their lives. Previously declining Kentucky communities are now connected to high-speed Internet (broadband) and it is making a difference.”).

<sup>59</sup> For example, the “Connect the Nation Act,” introduced by Senator Richard Durbin (D-IL) in 2007, would create a State Broadband Data and Development Grant Program to award grants to eligible entities for the development and implementation of statewide initiatives to identify and track the availability and adoption of broadband services within each state. Connect the Nation Act, S. 1190, 110th Cong. (2007).

<sup>60</sup> Technology Opportunities Program: About TOP, <http://www.ntia.doc.gov/top/about.html> (last visited Dec. 28, 2008).

<sup>61</sup> Centers for Medicare & Medicaid Services, Historical National Health Expenditure Data, [http://www.cms.hhs.gov/NationalHealthExpendData/02\\_NationalHealthAccountsHistorical.asp](http://www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp) (last visited Dec. 28, 2008).

<sup>62</sup> World Health Organization, Dep’t of Measurement & Health Info. Sys. of the Info., Evidence & Res. Cluster, *World Health Statistics 2007*, at 72-73 (2007), available at <http://www.who.int/whosis/whostat2007.pdf>.

<sup>63</sup> WORLD HEALTH ORGANIZATION, THE WORLD HEALTH REPORT 2000, HEALTH SYSTEMS: IMPROVING PERFORMANCE 155 (2000), available at [http://www.who.int/whr/2000/en/whr00\\_en.pdf](http://www.who.int/whr/2000/en/whr00_en.pdf).

a previous report, to help improve the quality of care, reduce costs and improve access to health information, the new administration should invest in healthcare IT.<sup>64</sup>

The first step in modernizing the American health care system is to establish a national health information network for the exchange of electronic health records (EHRs). An EHR<sup>65</sup> contains the complete medical history of a patient, including a full listing of illnesses, laboratory tests, treatments, drugs administered, and allergies. In 2004, President Bush issued an executive order calling for the rapid deployment of a nationwide interoperable health information technology network, including EHRs for all Americans, within 10 years.<sup>66</sup> Unfortunately, the current federal strategy of building this network from the bottom up has not created financially stable regional organizations and has failed to address several challenges such as system interoperability and privacy concerns.<sup>67</sup> It will be incumbent on the new administration to improve upon this vision and make available the resources needed to achieve this goal.

The new administration should chart a new course for overcoming the three main obstacles to EHR adoption, namely, cost, interoperability, and privacy concerns. One important step would be to support legislation such as the Independent Health Record Trust Act of 2007 sponsored by Reps. Dennis Moore (D-Kan.), Paul Ryan (R-Wis.), and Sen. Sam Brownback (R-Kan.) to establish health record data banks.<sup>68</sup> Health record data banks will spur health IT by creating a convincing value proposition that encourages providers to make long-term investments in EHRs. In addition, they simplify interoperability by storing all of an

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<sup>64</sup> DANIEL CASTRO, INFO. TECH. & INNOVATION FOUND., *IMPROVING HEALTH CARE: WHY A DOSE OF IT MAY BE JUST WHAT THE DOCTOR ORDERED* (2007), available at <http://www.itif.org/files/HealthIT.pdf> [hereinafter *IMPROVING HEALTH CARE*].

<sup>65</sup> In this essay, we use the term electronic health record or EHR to refer to a complete patient record. Other material may use the terms electronic medical record (EMR) or personal health record (PHR), which can have the same or a different meaning, depending on the context.

<sup>66</sup> Press Release, Dep't of Health & Human Serv., Thompson Launches "Decade of Health Information Technology" (July 21, 2004), available at [www.hhs.gov/news/press/2004pres/20040721a.html](http://www.hhs.gov/news/press/2004pres/20040721a.html).

<sup>67</sup> See, e.g., Robert H. Miller & Bradley S. Miller, *The Santa Barbara County Care Data Exchange: What Happened?*, 26 HEALTH AFFAIRS w568, w568 (2007).

<sup>68</sup> H.R. 2991, 110th Cong. (2007); see also DAVID B. KENDALL, PROGRESSIVE POLICY INST., *BUILDING A HEALTH INFORMATION NETWORK 6* (2007), available at [http://www.ppionline.org/documents/Health\\_IT\\_05.24.07.pdf](http://www.ppionline.org/documents/Health_IT_05.24.07.pdf).

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individual's medical information in a single repository and eliminating many privacy concerns because consumers would own the medical information deposited in their health data bank record.

Health data bank legislation should establish a fiduciary duty for each data bank operator to act in the best interests of its participants and prescribe penalties for a breach of these responsibilities. In addition, the legislation should prohibit data bank operators from charging fees to health care providers for accessing or updating an EHR to which they have been given access. Any such legislation should specifically state that all participation in a health record data bank is voluntary, and no entity, including employer, health insurance issuer or health care provider can compel participation.<sup>69</sup>

The administration must also work with Congress to ensure that these data banks do not become "data silos" so that customers can share their EHRs electronically with any third party.<sup>70</sup> Patients may wish to use software programs or online services to access and better utilize their health information.<sup>71</sup> According to Castro, "[o]nce a patient's medical information is digitized in a usable format, the applications and possibilities for innovation are limitless."<sup>72</sup>

To increase demand for EHRs, the new administration should work with Congress to cover the monthly access fees to participate in a health record data bank to all Medicare, Medicaid, and State Children's Health Insurance Program (SCHIP) enrollees.<sup>73</sup> The federal government is the single largest health care payer in the United States spending over \$600 billion annually on eighty million Americans through programs such as Medicare, Medicaid, and SCHIP.<sup>74</sup> Because adopting EHRs will lead to cost savings for health care payers, in this case the federal government, this strategy will ensure an effective investment of federal health care dollars. In addition, the administration can push Congress to require that "health plan issuers for federal employees include coverage to health record data banks as part of their covered services."<sup>75</sup>

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<sup>69</sup> IMPROVING HEALTH CARE, *supra* note 64, at 15.

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Id.*

<sup>73</sup> *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

On the supply side, the administration should work to ensure that health information is available to patients electronically. Although HIPAA established the right for individuals to obtain a paper copy of their health care records from their doctors, it does not require doctors to provide an electronic copy. In addition, under the current law, health care providers can charge reasonable fees associated with the cost of copying and mailing paper health care records, but they cannot charge fees for the time spent searching for or retrieving the records.<sup>76</sup> The new administration should work with Congress to modernize this legislation to require doctors to provide patients with an electronic copy of their health information upon request.<sup>77</sup> In addition, this legislation should establish a threshold date after which patients will no longer be charged fees when they request electronic copies of health records created after the threshold date. Patients will be charged only for requests for paper records or records created before this date. This mandate would protect patients' right of access to their medical information while also providing an economic incentive for medical practices to move to EHRs.<sup>78</sup>

Finally, the new administration should work with Congress to find proactive measures to speed EHR adoption, including funding for grants to promote the adoption of health IT, to develop and test quality measures, and to foster telemedicine. In addition, the administration should encourage Congress to establish a public-private partnership responsible for developing and recommending national standards for the electronic exchange of health information. To further protect patient privacy, the new administration should also encourage Congress to extend the health information privacy requirements found in HIPAA to cover any operator of an electronic database of health information.

## Conclusion

To advance American interests, President Obama needs to take a pragmatic and realistic approach to addressing technology policy issues. This means working to ensure that technology policies help create better jobs and improve productivity. It means working to overcome barriers to digital transformation in sectors like health care and transportation, and crafting proactive technology policies in areas like broadband. Finally, it means that

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<sup>76</sup> U.S. Dep't of Health & Human Servs., HIPAA Frequently Asked Questions — Notice and Other Individual Rights, <http://www.hhs.gov/hipaafaq/notice/353.html> (last visited Dec. 28, 2008).

<sup>77</sup> KENDALL, *supra* note 68, at 7.

<sup>78</sup> IMPROVING HEALTH CARE, *supra* note 64, at 15-16.

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the administration should protect and defend consumer interests, but not put out heavy-handed regulations that unfairly favor certain technologies.

Perhaps the most important step the new administration can take with respect to technology policy is to use the power of the presidency to set the right tone and create the right vision to help all Americans see that technological innovation, especially digital transformation, is critical to the future of the nation — that it is not something to be feared, but embraced. Too many technology policy advocates today present a vision of a menacing future with technology out of control, threatening citizens' freedom, privacy, jobs, and security, and damaging the environment. Of course technological innovation brings challenges, as it always has, but it also brings many opportunities. We need a president who can help Americans see that these opportunities are worth working for.