Why Sustainability Is Now the Key Driver of Innovation

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There's no alternative to sustainable development.

Even so, many companies are convinced that the more environment-friendly they become, the more the effort will erode their competitiveness. They believe it will add to costs and will not deliver immediate financial benefits.

Talk long enough to CEOs, particularly in the United States or Europe, and their concerns will pour out: Making our operations sustainable and developing "green" products places us at a disadvantage vis-à-vis rivals in developing countries that don't face the same pressures. Suppliers can't provide green inputs or transparency; sustainable manufacturing will demand new equipment and processes; and customers will not pay more for eco-friendly products during a recession. That's why most executives treat the need to become sustainable as a corporate social responsibility, divorced from business objectives.

Not surprisingly, the fight to save the planet has turned into a pitched battle between governments and companies, between companies and consumer activists, and sometimes between consumer activists and governments. It resembles a three-legged race, in which you move forward with the two untied legs but the tied third leg holds you back. One solution, mooted by policy experts and environmental activists, is more and increasingly tougher regulation. They argue that voluntary action is unlikely to be enough. Another group suggests educating and organizing consumers so that they will force businesses to become sustainable. Although both legislation and education are necessary, they may not be able to solve the problem quickly or completely.

Executives behave as though they have to choose between the largely social benefits of developing sustainable products or processes and the financial costs of doing so. But that's simply not true. We've been studying the sustainability initiatives of 30 large corporations for some time. Our research shows that sustainability is a mother lode of organizational and technological innovations that yield both bottom-line and top-line returns. Becoming environment-friendly lowers costs because companies end up reducing the inputs they use. In addition, the process generates additional revenues from better products or enables companies to create new

businesses. In fact, because those are the goals of corporate innovation, we find that smart companies now treat sustainability as innovation's new frontier.

Indeed, the quest for sustainability is already starting to transform the competitive landscape, which will force companies to change the way they think about products, technologies, processes, and business models. The key to progress, particularly in times of economic crisis, is innovation. Just as some internet companies survived the bust in 2000 to challenge incumbents, so, too, will sustainable corporations emerge from today's recession to upset the status quo. By treating sustainability as a goal today, early movers will develop competencies that rivals will be hard-pressed to match. That competitive advantage will stand them in good stead, because sustainability will always be an integral part of development.

It isn't going to be easy. Enterprises that have started the journey, our study shows, go through five distinct stages of change. They face different challenges at each stage and must develop new capabilities to tackle them, as we will show in the following pages. Mapping the road ahead will save companies time—and that could be critical, because the clock is ticking.

Stage 1: Viewing Compliance as Opportunity

The first steps companies must take on the long march to sustainability usually arise from the law. Compliance is complicated: Environmental regulations vary by country, by state or region, and even by city. (In 2007 San Francisco banned supermarkets from using plastic bags at checkout; San Diego still hasn't.) In addition to legal standards, enterprises feel pressured to abide by voluntary codes—general ones, such as the Greenhouse Gas Protocol, and sector-specific ones, such as the Forest Stewardship Council code and the Electronic Product Environmental Assessment Tool—that non-governmental agencies and industry groups have drawn up over the past two decades. These standards are more stringent than most countries' laws, particularly when they apply to cross-border trade.

It's tempting to adhere to the lowest environmental standards for as long as possible. However, it's smarter to comply with the most stringent rules, and to do so before they are enforced. This yields substantial first-mover advantages in terms of fostering innovation. For example, automobile manufacturers in the United States take two or three years to develop a new car model. If GM, Ford, or Chrysler had embraced the California Air Resources Board's fuel consumption and emissions standards when they were first proposed, in 2002, it would be two or three design cycles ahead of its

rivals today—and poised to pull further ahead by 2016, when those guidelines will become the basis of U.S. law.

Enterprises that focus on meeting emerging norms gain more time to experiment with materials, technologies, and processes. For instance, in the early 1990s Hewlett-Packard realized that because lead is toxic, governments would one day ban lead solders. Over the following decade it experimented with alternatives, and by 2006 the company had created solders that are an amalgam of tin, silver, and copper, and even developed chemical agents to tackle the problems of oxidization and tarnishing during the soldering process. Thus HP was able to comply with the European Union's Restriction of Hazardous Substances Directive, which regulates the use of lead in electronics products, as soon as it took effect, in July 2006.

Contrary to popular perceptions, conforming to the gold standard globally actually saves companies money. When they comply with the least stringent standards, enterprises must manage component sourcing, production, and logistics separately for each market, because rules differ by country. However, HP, Cisco, and other companies that enforce a single norm at all their manufacturing facilities worldwide benefit from economies of scale and can optimize supply chain operations. The common norm must logically be the toughest.

Companies can turn antagonistic regulators into allies by leading the way. For instance, HP has helped shape many environmental regulations in Europe, and it uses the resulting brownie points to advantage when necessary. In 2001 the European Union told hardware manufacturers that after January 2006 they could not use hexavalent chromium—which increases the risk of cancer in anyone who comes in contact with it—as an anticorrosion coating. Like its rivals, HP felt that the industry needed more time to develop an alternative. The company was able to persuade regulators to postpone the ban by one year so that it could complete trials on organic and trivalent chromium coatings. This saved it money, and HP used the time to transfer the technology to more than one vendor. The vendors competed to supply the new coatings, which helped reduce HP's costs.

Companies in the vanguard of compliance naturally spot business opportunities first. In 2002 HP learned that Europe's Waste Electrical and Electronic Equipment regulations would require hardware manufacturers to pay for the cost of recycling products in proportion to their sales. Calculating that the government-sponsored recycling arrangements were going to be expensive, HP teamed up with three electronics makers—Sony, Braun, and Electrolux—to create the private European Recycling Platform. In 2007 the platform, which works with more than 1,000

companies in 30 countries, recycled about 20% of the equipment covered by the WEEE Directive. Partly because of the scale of its operations, the platform's charges are about 55% lower than those of its rivals. Not only did HP save more than $100 million from 2003 to 2007, but it enhanced its reputation with consumers, policy makers, and the electronics industry by coming up with the idea.

Stage 2: Making Value Chains Sustainable

Once companies have learned to keep pace with regulation, they become more proactive about environmental issues. Many then focus on reducing the consumption of non-renewable resources such as coal, petroleum, and natural gas along with renewable resources such as water and timber. The drive to be more efficient extends from manufacturing facilities and offices to the value chain. At this stage, corporations work with suppliers and retailers to develop eco-friendly raw materials and components and reduce waste. The initial aim is usually to create a better image, but most corporations end up reducing costs or creating new businesses as well. That's particularly helpful in difficult economic times, when corporations are desperate to boost profits.

Companies develop sustainable operations by analysing each link in the value chain. First they make changes in obvious areas, such as supply chains, and then they move to less obvious suspects, such as returned products.

Supply chains. Most large corporations induce suppliers to become environment conscious by offering them incentives. For instance, responding to people's concerns about the destruction of rain forests and wetlands, multinational corporations such as Cargill and Unilever have invested in technology development and worked with farmers to develop sustainable practices in the cultivation of palm oil, soybeans, cacao, and other agricultural commodities. This has resulted in techniques to improve crop yields and seed production.

Some companies in the West have also started laying down the law. For example, in October 2008 Lee Scott, then Wal-Mart's CEO, gave more than 1,000 suppliers in China a directive: Reduce waste and emissions; cut packaging costs by 5% by 2013; and increase the energy efficiency of products supplied to Wal-Mart stores by 25% in three years' time. In like vein, Unilever has declared that by 2015 it will be purchasing palm oil and tea only from sustainable sources, and Staples intends that most of its paper-based products will come from sustainable-yield forests by 2010.

Tools such as enterprise carbon management, carbon and energy footprint analysis, and life-cycle assessment help companies identify the sources of waste in supply

chains. Life-cycle assessment is particularly useful: It captures the environment-related inputs and outputs of entire value chains, from raw materials supply through product use to returns. This has helped companies discover, for instance, that vendors consume as much as 80% of the energy, water, and other resources used by a supply chain, and that they must be a priority in the drive to create sustainable operations.

Operations. Central to building a sustainable supply chain are operational innovations that lead to greater energy efficiency and reduce companies' dependence on fossil fuels. Take the case of FedEx, which deploys a fleet of 700 aircraft and 44,000 motorized vehicles that consume 4 million gallons of fuel a day. Despite the global slowdown, the company is replacing old aircraft with Boeing 757s as part of its Fuel Sense program, although it will postpone ordering new ones until 2010. This will reduce the company's fuel consumption by 36% while increasing capacity by 20%. It is also introducing Boeing 777s, which will reduce fuel consumption by a further 18%. FedEx has developed a set of 30 software programs that help optimize aircraft schedules, flight routes, the amount of extra fuel on board, and so on. The company has set up 1.5-megawatt solar-energy systems at its distribution hubs in California and Cologne, Germany. It uses hybrid vans that are 42% more fuel efficient than conventional trucks and has replaced more than 25% of its fleet with smaller, more fuel-efficient vehicles. Following some other pioneers, FedEx recently turned its energy-saving expertise into a standalone consulting business that, it hopes, will become a profit centre.

Workplaces. Partly because of environmental concerns, some corporations encourage employees to work from home. This leads to reductions in travel time, travel costs, and energy use. One-tenth of the corporations in our sample had from 21% to 50% of their employees telecommuting regularly. Of IBM's 320,000 employees, 25% telecommute, which leads to an annual savings of $700 million in real estate costs alone. AT&T estimates that it saves $550 million annually as a result of telecommuting. Productivity rises by 10% to 20%, and job satisfaction also increases when people telecommute up to three days a week. For example, at the health-care services provider McKesson, the group that reported the highest job satisfaction in 2007 consisted of 1,000 nurses who worked from home.

Sustainability Challenges, Competencies, and Opportunities

STAGE 1 **Viewing Compliance as Opportunity**	STAGE 2 **Making Value Chains Sustainable**	STAGE 3 **Designing Sustainable Products and Services**	STAGE 4 **Developing New Business Models**	STAGE 5 **Creating Next- Practice Platforms**
CENTRAL CHALLENGE To ensure that compliance with norms becomes an opportunity for innovation. **COMPETENCIES NEEDED** >> The ability to anticipate and shape regulations. >> The skill to work with other companies, including rivals, to implement creative solutions. **INNOVATION OPPORTUNITY** >> Using compliance to induce the company and its partners to experiment with sustainable technologies, materials, and processes.	**CENTRAL CHALLENGE** To increase efficiencies throughout the value chain. **COMPETENCIES NEEDED** >> Expertise in techniques such as carbon management and life-cycle assessment. >> The ability to redesign operations to use less energy and water, produce fewer emissions, and generate less waste. >> The capacity to ensure that suppliers and retailers make their operations eco-friendly. **INNOVATION OPPORTUNITIES** >> Developing sustainable sources of raw materials and components. >> Increasing the use of clean energy sources such as wind and solar power. >> Finding innovative uses for returned products.	**CENTRAL CHALLENGE** To develop sustainable offerings or redesign existing ones to become eco-friendly. **COMPETENCIES NEEDED** >> The skills to know which products or services are most unfriendly to the environment. >> The ability to generate real public support for sustainable offerings and not be considered as "green washing." >> The management know how to scale both supplies of green materials and the manufacture of products. **INNOVATION OPPORTUNITIES** >> Applying techniques such as biomimicry in product development. >> Developing compact and eco-friendly packaging.	**CENTRAL CHALLENGE** To find novel ways of delivering and capturing value, which will change the basis of competition. **COMPETENCIES NEEDED** >> The capacity to understand what consumers want and to figure out different ways to meet those demands. >> The ability to understand how partners can enhance the value of offerings. **INNOVATION OPPORTUNITIES** >> Developing new delivery technologies that change value-chain relationships in significant ways. >> Creating monetization models that relate to services rather than products. >> Devising business models that combine digital and physical infrastructures.	**CENTRAL CHALLENGE** To question through the sustainability lens the dominant logic behind business today. **COMPETENCIES REQUIRED** >> Knowledge of how renewable and nonrenewable resources affect business ecosystems and industries. >> The expertise to synthesize business models, technologies, and regulations in different industries. **INNOVATION OPPORTUNITIES** >> Building business platforms that will enable customers and suppliers to manage energy in radically different ways. >> Developing products that won't need water in categories traditionally associated with it, such as cleaning products. >> Designing technologies that will allow industries to use the energy produced as a by-product.

Returns. Concerns about cutting waste invariably spark companies' interest in product returns. In the United States, returns reduce corporate profitability by an average of about 4% a year. Instead of scrapping returned products, companies at this stage try to recapture some of the lost value by reusing them. Not only can this turn a cost centre into a profitable business, but the change in attitude signals that the company is more concerned about preventing environmental damage and reducing waste than it is about cannibalizing sales.

Cisco, for example, had traditionally regarded the used equipment it received as scrap and recycled it at a cost of about $8 million a year. Four years ago it tried to find uses for the equipment, mainly because 80% of the returns were in working condition. A value-recovery team at Cisco identified internal customers that included its customer service organization, which supports warranty claims and service contracts, and the labs that provide technical support, training, and product demonstrations. In 2005 Cisco designated the recycling group as a business unit, set clear objectives for it, and drew up a notional P&L account. As a result, the reuse of equipment rose from 5% in 2004 to 45% in 2008, and Cisco's recycling costs fell by 40%. The unit has become a profit centre that contributed $100 million to Cisco's bottom line in 2008.

When they create environment friendly value chains, companies uncover the monetary benefits that energy efficiency and waste reduction can deliver. They also learn to build mechanisms that link sustainability initiatives to business results, as the Cisco example shows. As a result, environmental concerns take root within business units, allowing executives to tackle the next big challenge.

Stage 3: Designing Sustainable Products and Services

At this stage executives start waking up to the fact that a sizable number of consumers prefer eco-friendly offerings, and that their businesses can score over rivals by being the first to redesign existing products or develop new ones. In order to identify product innovation priorities, enterprises have to use competencies and tools they acquired at earlier stages of their evolution.

Companies are often startled to discover which products are unfriendly to the environment. When Procter & Gamble, for example, conducted life-cycle assessments to calculate the amount of energy needed to use its products, it found that detergents can make U.S. households energy guzzlers. They spend 3% of their

annual electricity budgets to heat water for washing clothes. If they switched to cold-water washing, P&G reckoned, they would consume 80 billion fewer kilowatt hours of electricity and emit 34 million fewer tons of carbon dioxide. That's why the company made the development of cold-water detergents a priority. In 2005 P&G launched Tide Coldwater in the United States and Ariel Cool Clean in Europe. The trend has caught on more in Europe than in the United States. By 2008, 21% of British households were washing in cold water, up from 2% in 2002; in Holland the number shot up from 5% to 52% of households. During the current recession P&G has continued to promote cold-water products, emphasizing their lower energy costs and compact packaging. If cold-water washing catches on worldwide, P&G will be able to cash in on the trend.

Likewise, Clorox was surprised to learn that household cleaning products are the second biggest environmental concern—after automobiles—in the United States. Its market research also showed that 15% of consumers treat health and sustainability as major criteria when making purchase decisions, and 25% to 35% take environmental benefits into consideration.

In 2008 Clorox became the first mainstream consumer products company to launch a line of non-synthetic cleaning products. It spent three years and more than $20 million to develop the Green Works line, delaying the launch twice to ensure that all five original products performed as well as or better than conventional options in blind tests.

Clorox had to tackle several marketing issues before launching Green Works. It decided to charge a 15% to 25% premium over conventional cleaners to reflect the higher costs of raw materials. Green Works products are still cheaper than competing products, which carry a 25% to 50% mark-up over synthetic ones. After much discussion, the marketing team chose to put the Clorox logo on the Green Works line to signal that it performs as well as conventional Clorox products. The company persuaded the Sierra Club—a leading environmental group in the United States—to endorse Green Works. Although it sparked controversy among activists, this partnership strengthened Clorox's credentials, and in 2008 the company paid nearly $500,000 to the Sierra Club as its share of revenues from the line. Finally, Clorox struck special arrangements with retail chains such as Wal-Mart and Safeway to ensure that consumers could easily find Green Works products on shelves.

By the end of 2008 Green Works had grown the U.S. natural cleaners market by 100%, and Clorox enjoyed a 40% share of the $200 million market. Green Works sales weakened in the fourth quarter of 2008 because of the recession, but they

rebounded in the first quarter of 2009. The tailwind has encouraged Clorox to launch more sustainable products: In January 2009 it introduced biodegradable cleaning wipes, and the following June it introduced non-synthetic detergents, where it will run into rival P&G.

To design sustainable products, companies have to understand consumer concerns and carefully examine product life cycles. They must learn to combine marketing skills with their expertise in scaling up raw-materials supplies and distribution. As they move into markets that lie beyond their traditional expertise, they have to team up with nongovernmental organizations. Smart companies like P&G and Clorox, which have continued to invest in eco-friendly products despite the recession, look beyond the public-relations benefits to hone competencies that will enable them to dominate markets tomorrow.

A Few Simple Rules

Smart corporations follow these simple rules in their effort to become sustainable.

Don't start from the present. If the starting point is the current approach to business, the view of the future is likely to be an optimistic extrapolation. It's better to start from the future. Once senior managers establish a consensus about the shape of things to come, they can fold that future into the present. They should ask: What are the milestones on the path to our desired future? What steps can we take today that will enable us to get there? How will we know that we are moving in that direction?

Ensure that learning precedes investments. Top management's interest in sustainability sometimes leads to investments in projects without an understanding of how to execute them. Smart companies start small, learn fast, and scale rapidly. Each step is broken into three phases: experiments and pilots, debriefing and learning, and scaling. These companies benchmark, but the goal is to develop next practices—not merely mimic best practices.

Stay wedded to the goal while constantly adjusting tactics. Smart executives accept that they will have to make many tactical adjustments along the way. A journey that takes companies through five stages—and lasts a decade or more—can't be completed without course corrections and major changes. Although directional consistency is important, tactical flexibility is critical.

Build collaborative capacity. Few innovations, be they to comply with regulations or to create a new line of products, can be developed in today's world unless

companies form alliances with other businesses, nongovernmental organizations, and governments. Success often depends on executives' ability to create new mechanisms for developing products, distributing them, and sharing revenues.

Use a global presence to experiment. Multinational corporations enjoy an advantage in that they can experiment overseas as well as at home. The governments of many developing countries have become concerned about the environment and are encouraging companies to introduce sustainable products and processes, especially for those at the bottom of the pyramid. It's easier for global enterprises to foster innovation in emerging markets, where there are fewer entrenched systems or traditional mind-sets to overcome.

Stage 4: Developing New Business Models

Most executives assume that creating a sustainable business model entails simply rethinking the customer value proposition and figuring out how to deliver a new one. However, successful models include novel ways of capturing revenues and delivering services in tandem with other companies. In 2008 FedEx came up with a novel business model by integrating the Kinko's chain of print shops that it had acquired in 2004 with its document delivery business. Instead of shipping copies of a document from, say, Seattle to New York, FedEx now asks customers if they would like to electronically transfer the master copy to one of its offices in New York. It prints and binds the document at an outlet there and can deliver copies anywhere in the city the next morning. The customer gets more time to prepare the material, gains access to better quality printing, and can choose from a wide range of document formats that Fed-Ex provides. The document travels most of the way electronically and only the last few miles in a truck. FedEx's costs shrink and its services become extremely eco-friendly.

Some companies have developed new models just by asking at different times what their business should be. That's what Waste Management, the $14 billion market leader in garbage disposal, did. Two years ago it estimated that some $9 billion worth of reusable materials might be found in the waste it carried to landfills each year. At about the same time, its customers, too, began to realize that they were throwing away money. Waste Management set up a unit, Green Squad, to generate value from waste. For instance, Green Squad has partnered with Sony in the United States to collect electronic waste that used to end up in landfills. Instead of being just a

waste trucking company, Waste Management is showing customers both how to recover value from waste and how to reduce waste.

New technologies provide start-ups with the ability to challenge conventional wisdom. Calera, a California start-up, has developed technology to extract carbon dioxide from industrial emissions and bubble it through seawater to manufacture cement. The process mimics that used by coral, which builds shells and reefs from the calcium and magnesium in seawater. If successful, Calera's technology will solve two problems: Removing emissions from power plants and other polluting enterprises, and minimizing emissions during cement production. The company's first cement plant is located in the Monterey Bay area, near the Moss Landing power plant, which emits 3.5 million tons of carbon dioxide annually. The key question is whether Calera's cement will be strong enough when produced in large quantities to rival conventional Portland cement. The company is toying with a radical business model: It will give away cement to customers while charging polluters a fee for removing their emissions. Calera's future is hard to predict, but its technology may well upend an established industry and create a cleaner world.

Developing a new business model requires exploring alternatives to current ways of doing business as well as understanding how companies can meet customers' needs differently. Executives must learn to question existing models and to act entrepreneurially to develop new delivery mechanisms. As companies become more adept at this, the experience will lead them to the final stage of sustainable innovation, where the impact of a new product or process extends beyond a single market.

Stage 5: Creating Next-Practice Platforms

Next practices change existing paradigms. To develop innovations that lead to next practices, executives must question the implicit assumptions behind current practices. This is exactly what led to today's industrial and services economy. Somebody once asked: Can we create a carriage that moves without horses pulling it? Can we fly like birds? Can we dive like whales? By questioning the status quo, people and companies have changed it. In like vein, we must ask questions about scarce resources: Can we develop waterless detergents? Can we breed rice that grows without water? Can biodegradable packaging help seed the earth with plants and trees?

Sustainability can lead to interesting next practice platforms. One is emerging at the intersection of the internet and energy management. Called the smart grid, it uses

digital technology to manage power generation, transmission, and distribution from all types of sources along with consumer demand. The smart grid will lead to lower costs as well as the more efficient use of energy. The concept has been around for years, but the huge investments going into it today will soon make it a reality. The grid will allow companies to optimize the energy use of computers, network devices, machinery, telephones, and building equipment, through meters, sensors, and applications. It will also enable the development of cross-industry platforms to manage the energy needs of cities, companies, buildings, and households. Technology vendors such as Cisco, HP, Dell, and IBM are already investing to develop these platforms, as are utilities like Duke Energy, So Cal Edison, and Florida Power & Light.

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Two enterprise wide initiatives help companies become sustainable. One: When a company's top management team decides to focus on the problem, change happens quickly. For instance, in 2005 General Electric's CEO, Jeff Immelt, declared that the company would focus on tackling environmental issues. Since then every GE business has tried to move up the sustainability ladder, which has helped the conglomerate take the lead in several industries. Two: Recruiting and retaining the right kind of people is important. Recent research suggests that three-fourths of workforce entrants in the United States regard social responsibility and environmental commitment as important criteria in selecting employers. People who are happy about their employers' positions on those issues also enjoy working for them. Thus companies that try to become sustainable may well find it easier to hire and retain talent.

Leadership and talent are critical for developing a low-carbon economy. The current economic system has placed enormous pressure on the planet while catering to the needs of only about a quarter of the people on it, but over the next decade twice that number will become consumers and producers. Traditional approaches to business will collapse, and companies will have to develop innovative solutions. That will happen only when executives recognize a simple truth: Sustainability = Innovation.

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Thatâ€™s why sustainability should be a touchstone for all innovation. â€¢ In the future, only companies that make sustainability a goal will achieve competitive advantage. That means rethinking business models as well as products, technologies, and processes.Â The key to progress, particularly in times of economic crisis, is innovation. Just as some internet companies survived the bust in 2000 to challenge incumbents, so, too, will sustainable corporations emerge from todayâ€™s recession to upset the status quo. By treating sustainability as a goal today, early movers will develop competencies that rivals will be hard-pressed to match. That competitive advantage will stand them in good stead, because sustainability will always be an integral part of development. Another home-grown business that has successfully used innovation toward bettering the environment and people's well being is Aeroqual. The Kiwi business works in monitoring air quality and has created its sensors to be a fraction of the size of the large container-sized commercial sensors many countries use. Its box, the size of a large suitcase, can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. Nidumolu, R., Prahalad, C.K. and Rangaswami, M.R. (2009) Why Sustainability Is Now the Key Driver of Innovation. Harvard Business Review, September Issue, 57-64. has been cited by the following articleÂ Authors coined the term sustainable technological innovation to refer to a technological innovation in accordance to the principles of sustainability. The object of this research was comparing the sustainability of a Fresnel Lens Solar Concentration (FLSC) against the sustainability of other twelve alternatives to generate heat.Â Why Marx Was a Bad Driver: Alienation to Sensuality in the Anthropology of Automobility. Andrew Dawson. DOI: 10.4236/aa.2017.71001 1 087 Downloads 1 582 Views Citations.