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Corporate Responsibility



7th Corporate Social Responsibility Awards

January 25th, 2018 Marriott Hotel, Karachi

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EBU **ETHICAL** BUSINESS UPDATE

is an online magazine with a strong heritage in the fields of ethics, governance, corporate responsibility and socially responsible investing.

Now available only on the web, but soon will be published and will be available for monthly subscription.

The mission of Ethical Business Update – now, as then – is “to promote ethical business practices, to serve that growing community of professionals and individuals striving to work and invest in responsible ways.” We believe this is not only how to guarantee a future for all, but makes good business sense.

A lot has changed in the more than two decades, ethics and governance have emerged as front-page news and lead agenda items in corporate board rooms and the halls of Congress.

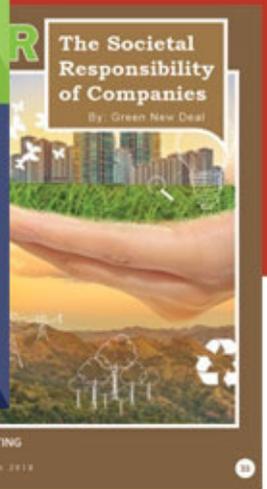
Good corporate citizenship is now studied, advocated and sometimes practiced. Sustainability has become a goal for well-meaning small businesses as well as many of the Fortune 500.

Whether that represents real progress is open to debate. The continuing fallout from the recent economic and financial crises is a constant reminder that many systems are not working. There’s plenty to discuss. Ethical Business Update aims to serve as a guide.

We seek to do that by offering our readers information, opinion and cutting-edge analysis about business and the intersection of business and society.

We serve CSR, compliance, risk and governance communities with topical and insightful business intelligence and meeting places.

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FOUR SUPPLY CHAIN PREDICTIONS FOR 2018

SUPPLY CHAIN
36th Edition 2018



4 supply chain predictions for 2018

By: Craig Guillot

Manufacturers, distributors and retailers continue to shift to digital as a way to improve visibility and improve efficiencies. Experts say 2018 will be another year of transition as digital transformation becomes more important than ever in supply chain planning, fulfillment and procurement.

From widespread adoption of the cloud and greater use of artificial intelligence to the potential applications of blockchain, here are 4 supply chain trends and predictions for 2018.

Movement to mass adoption of the cloud

Supply chains will continue to move from analog to digital in the coming year, according to a recent re

While supply chains have been migrating to the cloud for the past few years, it's now reaching mass-scale adoption. IDC predicts that by 2020, approximately 80% of supply chain interactions will happen across cloud-based commerce networks.

Companies will continue to adopt data-driven logistics, using algorithms, data-visualization strategies and smart analytics to shorten delivery times and increase efficiencies. The resulting boost in resiliency could reduce the impact of supply chain disruptions by up to one-third, according to IDC.

Kimberly Knickle, research vice president of IT Priorities and Strategies at IDC Manufacturing Insights, said manufacturers have prioritized cloud adoption initiatives in their supply chains because there is "so much information that needs to be shared with terminal constituents."

Retailers and distributors are also investing in cloud-based unified commerce platforms to drive a seamless experience for customers, said Jim Barnes, president and CEO of supply chain consulting firm Envista.

Multi-enterprise visibility will be key as stakeholders in all areas of the supply chain move to new platforms at a faster rate in the coming year.

Retailers and distributors are also investing in cloud-based unified commerce platforms to drive a seamless experience for customers, said Jim Barnes, president and CEO of supply chain consulting firm Envista.





Beyond simple analytics to artificial intelligence

The coming year will also bring a shift beyond simple analytics to more widespread use of artificial intelligence and machine learning, Knickle said.

IoT devices are now being deployed through all areas of the supply chain to help manufacturers understand where their goods are in transit and how they can improve material procurement and product distribution.

"We're seeing sensor information pulled in through live feeds, taken through EDI downloads and translated into machine learning, so we can understand predictively what will happen," Knickle said.

Robert Handfield, executive director of the Supply Chain Resource Cooperative at North Carolina State University, said machine learning capabilities will "grow significantly in 2018."

While machines will become smarter and gain the ability to process more information, humans will always remain in the loop, Handfield said.

It's not going to be like a rise of the machines. Machines will provide information to humans so they can make better decisions based on more data more quickly," Handfield said.

Building on blockchain

Blockchain will also be a growing topic in 2018. Within the next three years, roughly one-third of manufacturers and retailers will be tracking goods through blockchain, according to IDC.

Blockchain has recently emerged as a valuable tool for creating immutable records in a distributed ledger that can allow all participants in a certain supply chain to understand the movement of goods.

This can offer better visibility into the state of goods and delivery which will give manufacturers, wholesalers and retailers a better understanding of the causes of slowdowns or damage.

While concern about a "bubble" in the value of Bitcoin has been dominating the news in recent months, the underlying blockchain technology has been validated by experts to have strong potential in many industries, including logistics.

While concern about a "bubble" in the value of Bitcoin has been dominating the news in recent months, the underlying blockchain technology has been validated by experts to have strong potential in many industries, including logistics.

"We've been hearing a lot of interest in terms of blockchain. They're in the education and learning phase but we'll definitely see a lot of opportunities for blockchain in the supply chain," Knickle said.

UPCOMING EVENTS



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One area of great value will be in regulatory compliance. Manufacturers are already testing the blockchain technologies to demonstrate compliance with the Drug Supply Chain Security Act and the Food Safety Modernization Act.

Victoria Brown, senior research analyst with IDC Retail Insights, said manufacturers are discussing how they can identify markers that they want to standardize for traceability on particular items.

"It's in an early stage, but it's coming, and there will be more conversations about how it will change and impact the supply chain moving forward," Brown said.

Increasing reliance on robotics

Robots will be in use in half of fulfillment centers by 2019, according to IDC. This will result in productivity gains of up to 30%, help drive down the cost of operations and off set an increasing shortage of labor.

As the technology advances and costs fall, organizations are finding new applications for robots and using them in areas to reduce human movement.

Advances in perceptive abilities and grippers have given many of these machines "a greater grasp and human-like feel to them," Knickle said.

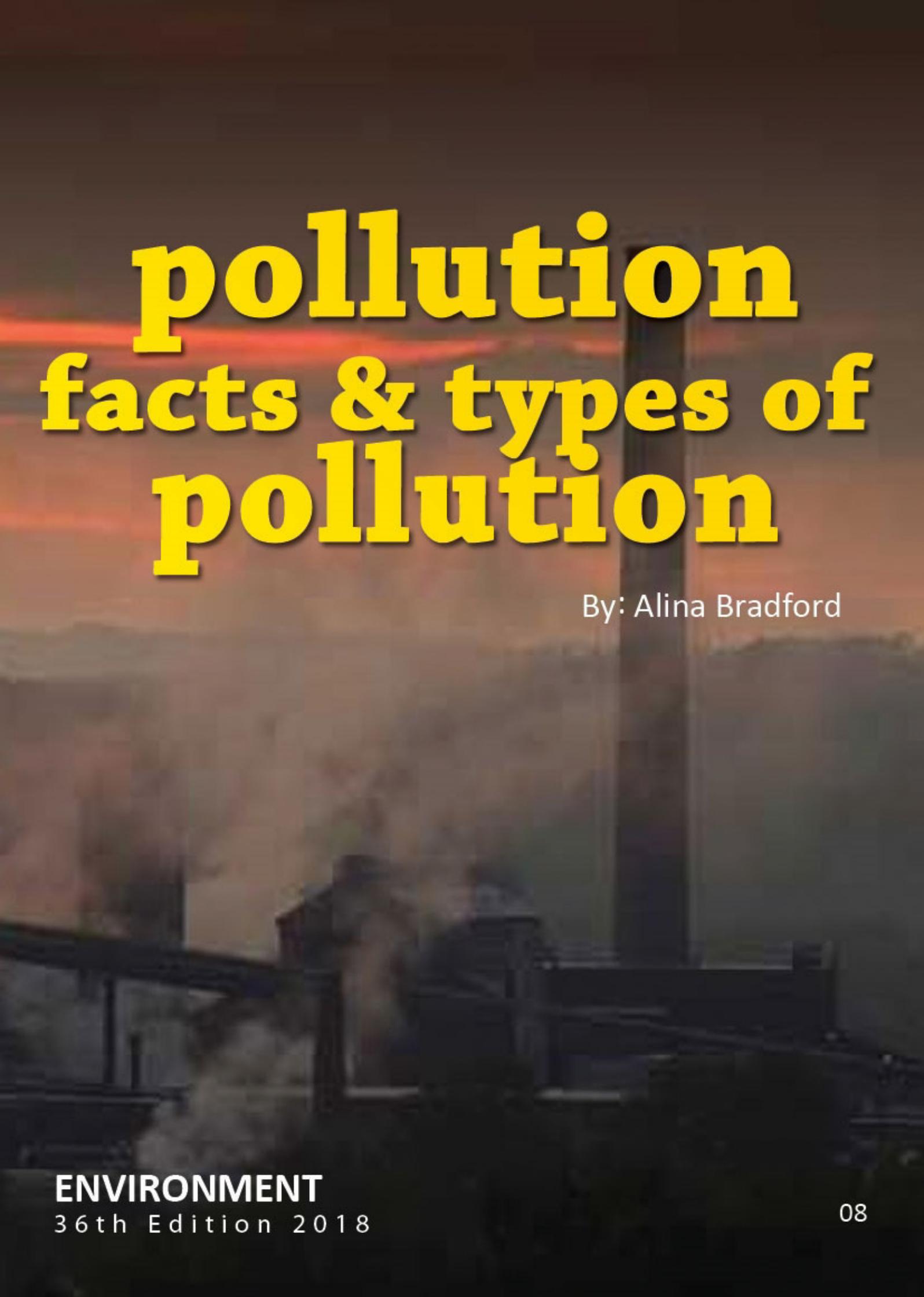
"They're able to do things on a more granular level, like pick things up and move them and handle them in ways in which they couldn't in the past," Knickle said.

Samuel Bouchard, CEO of Robotiq, said new collaborative robots are becoming easier to program and can be adapted to meet the needs of the supply chain.

Through sensors, end-effectors and programming, distribution centers and warehouses can deploy these flexible robots to handle a multitude of tasks.

"Lots of repetitive movements can be automated with collaborative robots. This will allow human operators to focus on value-added jobs, increasing quality and productivity in the process," Bouchard said.





pollution facts & types of pollution

By: Alina Bradford

ENVIRONMENT

36th Edition 2018

08



Pollution Facts & Types of Pollution

By: Alina Bradford

Pollution is the process of making land, water, air or other parts of the environment dirty and not safe or suitable to use. This can be done through the introduction of a contaminant into a natural environment, but the contaminant doesn't need to be tangible. Things as simple as light, sound and temperature can be considered pollutants when introduced artificially into an environment.

Toxic pollution affects more than 200 million people worldwide, according to Pure Earth, a non-profit environmental organization. In some of the world's worst polluted places, babies are born with birth defects, children have lost 30 to 40 IQ points, and life expectancy may be as low as 45 years because of cancers and other diseases. Read on to find out more about specific types of pollution.

Land pollution

Land can become polluted by household garbage and by industrial waste. In 2014, Americans produced about 258 million tons of solid waste, according to the U.S. Environmental Protection Agency. A little over half of the waste — 136 million tons— was gathered in landfills. Only about 34 percent was recycled or composted.

Organic material was the largest component of the garbage generated, the EPA said. Paper and paperboard accounted for more than 26 percent; food was 15 percent and yard trimmings were 13 percent. Plastics comprised about 13 percent of the solid waste, while rubber, leather and textiles made up 9.5 percent and metals 9 percent. Wood contributed to 6.2 percent of the garbage; glass was 4.4 percent and other miscellaneous materials made up about 3 percent.

Commercial or industrial waste is a significant portion of solid waste. According to the University of Utah, industries use 4 million pounds of materials in order to provide the average American family with needed products for one year. Much of it is classified as non-hazardous, such as construction material (wood, concrete, bricks, glass, etc.) and medical waste (bandages, surgical gloves, surgical instruments, discarded needles, etc.).

Hazardous waste is any liquid, solid or sludge waste that contain properties that are dangerous or potentially harmful to human health or the environment. Industries generate hazardous waste from mining, petroleum refining, pesticide manufacturing and other chemical production. Households generate hazardous waste as well, including paints and solvents, motor oil, fluorescent lights, aerosol cans, and ammunition.





Water pollution

Water pollution happens when chemicals or dangerous foreign substances are introduced to water, including chemicals, sewage, pesticides and fertilizers from agricultural runoff, or metals like lead or mercury. According to the Environmental Protection Agency (EPA), 44 percent of assessed stream miles, 64 percent of lakes and 30 percent of bay and estuarine areas are not clean enough for fishing and swimming.

The EPA also states that the United State's most common contaminants are bacteria, mercury, phosphorus and nitrogen. These come from the most common sources of contaminates, that include agricultural runoff, air deposition, water diversions and channelization of streams.

Water pollution isn't just a problem for the United States. According to United Nations, 783 million people do not have access to clean water and around 2.5 billion do not have access to adequate sanitation. Adequate sanitation helps to keep sewage and other contaminants from entering the water supply.

According to National Oceanic and Atmospheric Administration (NOAA), 80 percent of pollution in marine environment comes from the land through sources like runoff. Water pollution can also severely affect marine life. For example, sewage causes pathogens to grow, while organic and inorganic compounds in water can change the composition of the precious resource. According to the EPA, low levels of dissolved oxygen in the water are also considered a pollutant. Dissolved oxygen is caused by the decomposition of organic materials, such as sewage introduced into the water.

Warming water can also be harmful. The artificial warming of water is called thermal pollution. It can happen when a factory or power plant that is using water to cool its operations ends up discharging hot water. This makes the water hold less oxygen, which can kill fish and wildlife. The sudden change of temperature in the body of water can also kill fish. According to the University of Georgia, it is estimated that around half of the water withdrawn from water systems in the United States each year is used for cooling electric power plants.

"In nearly all cases, 90 percent of this water is returned to its source, where it can raise the water temperature in an area immediately surrounding the water discharge pipe. Depending on water flow, the water temperature quickly returns to ambient temperatures that do not harm fish." Donn Dears, former president of TSAugust, a not for profit corporation organization focused on energy issues, told Live Science.

Nutrient pollution, also called eutrophication, is another type of water pollution. It is when nutrients, such as nitrogen, are added into bodies of water. The nutrient works like fertilizer and makes algae grow at excessive rates, according to NOAA. The algae blocks light from other plants. The plants die and their decomposition leads to less oxygen in the water. Less oxygen in the water kills aquatic animals.



Air pollution

The air we breathe has a very exact chemical composition; 99 percent of it is made up of nitrogen, oxygen, water vapor and inert gases. Air pollution occurs when things that aren't normally there are added to the air. A common type of air pollution happens when people release particles into the air from burning fuels. This pollution looks like soot, containing millions of tiny particles, floating in the air.

Another common type of air pollution is dangerous gases, such as sulfur dioxide, carbon monoxide, nitrogen oxides and chemical vapors. These can take part in further chemical reactions once they are in the atmosphere, creating acid rain and smog. Other sources of air pollution can come from within buildings, such as secondhand smoke.

Finally, air pollution can take the form of greenhouse gases, such as carbon dioxide or sulfur dioxide, which are warming the planet through the greenhouse effect. According to the EPA, the greenhouse effect is when gases absorb the infrared radiation that is released from the Earth, preventing the heat from escaping. This is a natural process that keeps our atmosphere warm. If too many gases are introduced into the atmosphere, though, more heat is trapped and this can make the planet artificially warm, according to Columbia University.

Air pollution kills more than 2 million people each year, according to a study published in the journal of Environmental Research Letters. The effects of air pollution on human health can vary widely depending on the pollutant, according to Hugh Sealy, professor and director of the environmental and occupational health track at the Department of Public Health and Preventive Medicine, St. George's University, St. George's, Grenada.

If the pollutant is highly toxic, the effects on health can be widespread and severe. For example, the release of methyl isocyanate gas at Union Carbide plant in Bhopal in 1984 killed over 2,000 people, and over 200,000 suffered respiratory problems. An irritant (e.g. particulates less than 10 micrometers) may cause respiratory illnesses, cardiovascular disease and increases in asthma. "The very young, the old and those with vulnerable immune systems are most at risk from air pollution. The air pollutant may be carcinogenic (e.g. some volatile organic compounds) or biologically active (e.g. some viruses) or radioactive (e.g. radon). Other air pollutants like carbon dioxide have an indirect impact on human health through climate change," Sealy told Live Science.





Noise pollution

Even though humans can't see or smell noise pollution, it still affects the environment. Noise pollution happens when the sound coming from planes, industry or other sources reaches harmful levels. Research has shown that there are direct links between noise and health, including stress-related illnesses, high blood pressure, speech interference, hearing loss. For example, a study by the WHO Noise Environmental Burden on Disease working group found that noise pollution may contribute to hundreds of thousands of deaths per year by increasing the rates of coronary heart disease. Under the Clean Air Act, the EPA can regulate machine and plane noise.

Underwater noise pollution coming from ships has been shown to upset whales' navigation systems and kill other species that depend on the natural underwater world. Noise also makes wild species communicate louder, which can shorten their lifespan.

Noise pollution

Most people can't imagine living without the modern convenience of electric lights. For the natural world, though, lights have changed the way that days and nights work. Some consequences of light pollution are:

- Some birds sing at unnatural hours in the presence of artificial light.
- Scientists have determined that long artificial days can affect migration schedules, as they allow for longer feeding times.
- Streetlights can confuse newly hatched sea turtles that rely on starlight reflecting off the waves to guide them from the beach to the ocean. They often head in the wrong direction.
- Light pollution, called sky glow, also makes it difficult for astronomers, both professional and amateur, to properly see the stars.
- Plant's flowering and developmental patterns can be entirely disrupted by artificial light.
- According to a study by the American Geophysical Union, light pollution could also be making smog worse by destroying nitrate radicals that helps the dispersion of smog.

Turning on so many lights may not be necessary. Research published by International Journal of Science and Research estimates that over-illumination wastes about 2 million barrels of oil per day and lighting is responsible for one-fourth of all energy consumption worldwide.





Other pollution facts:

- Americans generate 30 billion foam cups, 220 million tires, and 1.8 billion disposable diapers every year, according to the Green Schools Alliance.
- According to the WHO, ambient air pollution contributes to 6.7 percent of all deaths worldwide.
- The Mississippi River drains the lands of nearly 40 percent of the continental United States. It also carries an estimated 1.5 million metric tons of nitrogen pollution into the Gulf of Mexico each year, resulting in a dead zone each summer about the size of New Jersey.
- Pollution in China can change weather patterns in the United States. It takes just five days for the jet stream to carry heavy air pollution from China to the United States, where it stops clouds from producing rain and snow.
- About 7 million premature deaths annually linked to air pollution, according to WHO. That is one in eight deaths worldwide.





7th **Islamic Finance** Expo & Conference

Marquee Hall, Marriott Hotel Karachi
May 8th 2018

Transforming Strategies to Revitalize Growth:
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"I shall watch with keenness the work of your research Organization in evolving banking practices compatible with Islamic ideas of social and economic life. We must work our destiny in our own way and present to the world an economic system based on true Islamic concept of equality of manhood and social justice"

Quaid-e-Azam Mohammad Ali Jinnah

Founder of Islamic Republic of Pakistan

On the Occasion of the Opening Ceremony of the State Bank of Pakistan on July 1, 1948

What's HR Like?





What's HR Like?

This past week I had a very cool experience !! One of our Team Members is going to college and wants to go into Human Resources. He asked if it would be okay to meet. I jumped at the chance !!



I went out to the restaurant where he works and we sat in a booth after we made the obligatory introductions. As we settled in, I started, "So, how can I help you?" Out of the blue he gives the most massive question possible, "So, what's HR like ??"

I'll be honest. I was speechless for a moment. It wasn't the question I expected. He didn't want to hear the odyssey of my career or honestly anything about me. It was incredibly refreshing !! He wanted to learn about the field, the profession, the ins and out as well as the ups and downs. By the way, he's a millennial.

According to the myriad of HR writing that exists in the blogosphere, this young man wasn't living up to his stereotype. He was engaged, interested and curious. He wasn't a slacker who was looking for something inane like work/life balance or how to make a gigantic salary while being a lone wolf who doesn't know how to communicate because he grew up with technology. Have I covered them all yet ?? But, I digress.

It was the best hour of my week. A chance to sit down and talk about how and why you can be passionate about HR and thriving in it as a career. So, what did I tell him HR was like ?? Here are a few of the key things I shared.

HR is Essential !!

This may seem a bit crass as an assumption, but it is a deep held belief by me. If an organization has humans, it has a need for human resources. I don't mean to belittle this at all because too often organizations think they can just wing it and hope that nothing horrid happens without HR. I understand that not all companies can have a full-time HR pro, but you can get HR resources that can assist you.

This reality of being essential gives HR a bright, tangible and valued future. This isn't about "how" HR is practiced. It is, however, the anchor for our existence !!





HR is NEVER the same !!

I explained that if you want to get into a field that is predictable, mundane and full of absolutes then don't go into HR. I did warn him that there are HR pros, and companies, who limit the scope, involvement and impact of what HR does for them. It saddens me that this exists, but I wanted him to have a holistic view of what he was pursuing. I think the constant ebb and flow of variety in HR is what sets it apart from most professions.

You have to remember that you're whole professional existence is surrounded by people. And people are NEVER the same . . . ever !! I explained that this can either be exhausting and frustrating or it can be energizing and exhilarating !! I think he knows which set I follow.

HR is a great career choice !!

I told him that this factor was hard to find and I appreciated that he was checking out the field by talking to HR pros. You see, I wasn't the first person he talked to. I was the third. I was geeked when he said, "I haven't heard this positive outlook about HR yet." I told him I wasn't surprised. I told him that I have a big, hairy audacious goal for ALL HR pros to be connected as well as passionate about who we are and what we do. He liked that and said THAT is what he was looking for in a career.

We closed the meeting by getting him connected on Linked In, adding him to my global HR network (The HR Net) and one more critical thing . . .

I told him that I'd be available for him whenever he needed me and for whatever other insight and advice he needed as he entered the world of HR.

You see, I didn't want him to see a stereotype of a generation either. I'm geeked for his present and his future !! And to think it all started with one question. If someone had to ask you, what would you say ?? What's HR like for you ??

I hope it's full of hope, positivity and passion because then you'll understand how incredible Human Resources really is !!





Do The Work II

Do you enjoy meeting people personally and professionally ?? Does there have to be a compelling reason to do so ?? Is the only reason you meet people is because you read a blog post that tells you to ??

I've been thinking about this lately because I thrive on meeting new people. That's a fact. Whenever I go to a new environment, I reach out to meet people. I really want to get to know them, know who they are and something unique about them. I understand that this isn't the norm and I wouldn't recommend it unless you have the capacity to take in more and more folks.

You see, I'm not a collector. Many people who network are because they have some ulterior motive that is intended to result in a sale of their services or products. When this occurs, people are only scratching the surface of truly connecting and yet people continue to do this. Just last week a person who was a guest at the restaurant I work at came up to me and said, "You look friendly and are always smiling. Here's my card, I represent . . ." I was floored. No name. No introduction. Just a chance to whip out the 30-second sales pitch because this is how you think it's effective to meet other people. I threw his card away.

Let me share an example of how networking has a lasting effect – as it should !! My best friend, Fred, calls me every week. Every. Week. He checks in to see how things are with me personally and professionally. He also just stepped up to run a monthly networking group, GETDOT Cincinnati, as their new President. By the way, he's officially "retired." Meeting new people really shouldn't matter to him anymore should it ??

Fred is not only a dear friend, but he's a great mentor and example that you need to have relationships with those in your network. That is the key !! If you can't tell others about a connection past a rectangular piece of paper, then they really aren't a connection at all. Remember, if you're too busy to make time for others, don't have them in your network and don't be in theirs. That may sound a bit harsh, but great connections encourage each other. They don't use each other.





The key to networking is to Do the Work !! I think that having a viable network and being an effective networker should be a mandatory skill for all business people and especially for those in HR. Let me be clear – this is a business skill and not a job hunting skill. We’ve lost sight that having a set of “go to” people makes you a stronger professional in your role both within your company and in your industry.

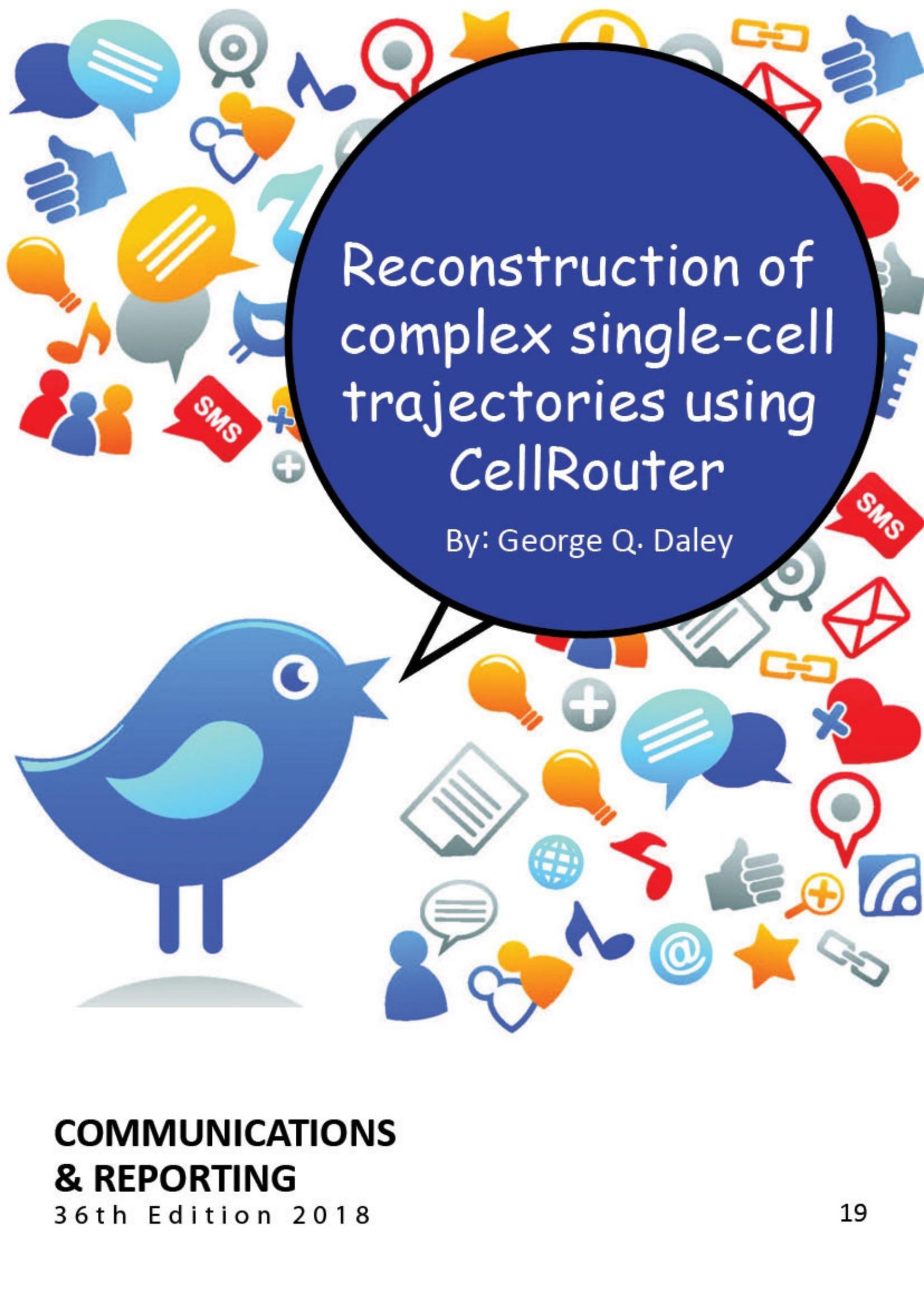
The challenge I see is that HR people are hesitant to reach out and meet others in our field. I don’t understand this because I’ve only seen it benefit me personally and allow me to have access to incredible folks !! This isn’t a factor of being extroverted or introverted. It is a factor that we don’t see the value of taking the time to connect with others.

This week, I’d like you to start doing the work of connecting. Make a commitment to connect with one or two new people in HR. Send them a Linked In request with a personalized invitation. Be active on Twitter and connect with other HR folks and share HR blogs you read with others. Go to events and find a few people you don’t know and take the time to intentionally meet them.

Be good with adding just a few people to your network each week. If you have a larger capacity, meet more people. However, commit to making sure they are connections and not collections. You’ll be a stronger HR pro when you have others around you that can encourage you and share their experiences and knowledge.

I hope you understand that I know that this makes a difference. It will be some of the most meaningful work you’ll ever do !!





Reconstruction of complex single-cell trajectories using CellRouter

By: George Q. Daley



**COMMUNICATIONS
& REPORTING**

36th Edition 2018



Reconstruction of complex single-cell trajectories using CellRouter

By: [George Q. Daley](#)

Abstract

A better understanding of the cell-fate transitions that occur in complex cellular ecosystems in normal development and disease could inform cell engineering efforts and lead to improved therapies. However, a major challenge is to simultaneously identify new cell states, and their transitions, to elucidate the gene expression dynamics governing cell-type diversification.

Here, we present CellRouter, a multifaceted single-cell analysis platform that identifies complex cell-state transition trajectories by using flow networks to explore the subpopulation structure of multi-dimensional, single-cell omics data.

We demonstrate its versatility by applying CellRouter to single-cell RNA sequencing data sets to reconstruct cell-state transition trajectories during hematopoietic stem and progenitor cell (HSPC) differentiation to the erythroid, myeloid and lymphoid lineages, as well as during re-specification of cell identity by cellular reprogramming of monocytes and B-cells to HSPCs. CellRouter opens previously undescribed paths for in-depth characterization of complex cellular ecosystems and establishment of enhanced cell engineering approaches.

Introduction

Gene expression profiling has been widely applied to understand regulation of cellular processes in development and disease¹. However, micro-environmental influences, asynchronous cell behaviors, and molecular stochasticity often leads to pronounced heterogeneity in cell populations, obscuring the dynamic biological principles governing cell-state transitions.

Single-cell, high-throughput technologies present an opportunity to characterize these states and their transitions by simultaneously quantifying a large number of parameters at single-cell resolution. However, as cells are destroyed during measurement, data-driven approaches are required to illuminate the dynamics of cellular programs governing fate transitions. To study gene expression dynamics, several algorithms have been developed to organize single cells in pseudo-temporal order based on transcriptomic or proteomic divergence^{2,3,4,5,6}.





While current algorithms best identify trajectories between the most phenotypically distant cell states, which molecularly are very distinct, they are less robust in reconstructing trajectories from early states towards intermediate or transitory cell states. Limitations include reconstructing linear trajectories (Waterfall, Monocle 1), identifying only a single branch point (Wishbone), or requiring a priori knowledge of the number of branches (Diffusion Pseudotime, DPT).

Monocle 2 addresses many of these challenges but is not designed to reconstruct trajectories between any two chosen cell states, which might include transitions from or to rare cell types. Moreover, as they are designed to identify branching trajectories, Wishbone, DPT, and Monocle 2 are less suited to detect convergent differentiation paths, such as during plasmacytoid dendritic cell development from distinct precursor cells⁷.

To overcome these challenges, we developed CellRouter (Supplementary Software 1–4, <https://github.com/edroaldo/cellrouter>), a general single-cell trajectory detection algorithm capable of exploring the subpopulation structure of single-cell omics data to reconstruct trajectories of complex transitions between cell states.

CellRouter requires no a priori knowledge of trajectory structure, such as number of cell fates or branches. CellRouter is a transition-centered trajectory reconstruction algorithm, distinct from the bifurcation-centered algorithms such as Wishbone, DPT, and Monocle 2. While bifurcations occur during lineage diversification, transitions also converge to specific lineages or occur between cell states within branches.

CellRouter relaxes the requirement of identifying branching points during cell-fate transitions and implements a flow network algorithm to flexibly reconstruct multi-state transition trajectories.

Moreover, CellRouter is independent of dimensionality reduction techniques and can be used, for example, with principal component analysis (PCA), t-stochastic neighbor embedding (t-SNE) or diffusion maps.

CellRouter is a flexible single-cell analysis platform designed to reconstruct single-cell trajectories of complex cell-state transitions. We apply CellRouter to several single-cell RNA-sequencing data sets to provide insight into multi-lineage differentiation from hematopoietic stem and progenitor cells (HSPCs) in snapshot data sets and also during a time-course of mesoderm diversification towards the blood lineage, revealing sequential waves of gene expression changes along differentiation trajectories.

Moreover, we provide insight to guide cellular reprogramming by exploring stem cell differentiation data sets as a blueprint to identify reprogramming trajectories and develop new cell engineering strategies.

CellRouter integrates subpopulation identification, multi-state trajectories, and gene regulatory networks (GRNs) to provide new insights into cell-state transitions during lineage diversification, convergence, or cell reprogramming.



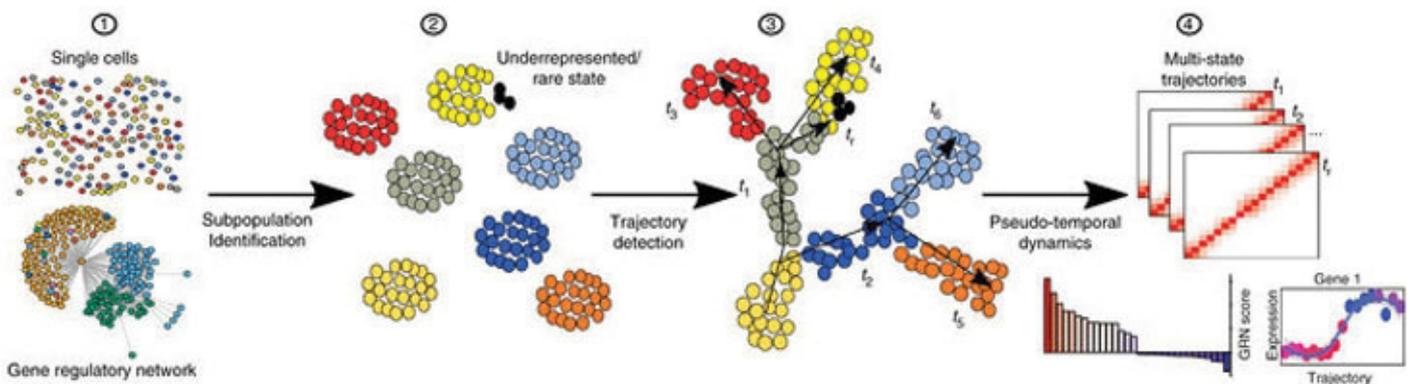
Reconstructing complex single-cell trajectories

To identify multi-state transition trajectories, CellRouter builds a k-nearest neighbor (kNN) graph from cell-cell relationships in a space of reduced dimensionality (Fig. 1). CellRouter then transforms the kNN graph to represent cell-cell similarities by assigning weights to each edge based on network similarity metrics (e.g., the Jaccard similarity).

This approach weakens connections between unrelated cell types and strengthens connections between cells within the same subpopulation, better representing phenotypic relatedness⁸. Next, using community-detection algorithms (e.g., the Louvain method), subpopulations are defined by identifying communities of densely inter-connected cells^{8, 9}.

Then, CellRouter uses a graph theory approach to solve the minimum cost flow problem and precisely define trajectories between any two subpopulations (t_1, t_2, \dots, t_6)^{10, 11}, including transitions to intermediate states (t_1, t_2) or rare or under-represented cell types or states (t_r) (Fig. 1, Supplementary Note 1, Supplementary Method). Importantly, CellRouter identifies a subset of representative transitioning cells, better accounting for stochastic or regulated cell-to-cell variation. Finally, to account for drop out events in single-cell RNA-seq data, CellRouter explores the local topology of the kNN graph to smoothen the kinetic trends along each trajectory.

Fig. 1



Overview of CellRouter.

Step (1) Starting from single cells representing multiple cell states, including stable and in transition, a gene regulatory network was built to identify putative gene regulatory relationships.

Step (2) Subpopulations were identified by a combination of learning the structure of the data and community detection algorithms.

Step (3) High-resolution multi-state trajectories are identified from any subpopulation to any other, including intermediate and mature cell types.

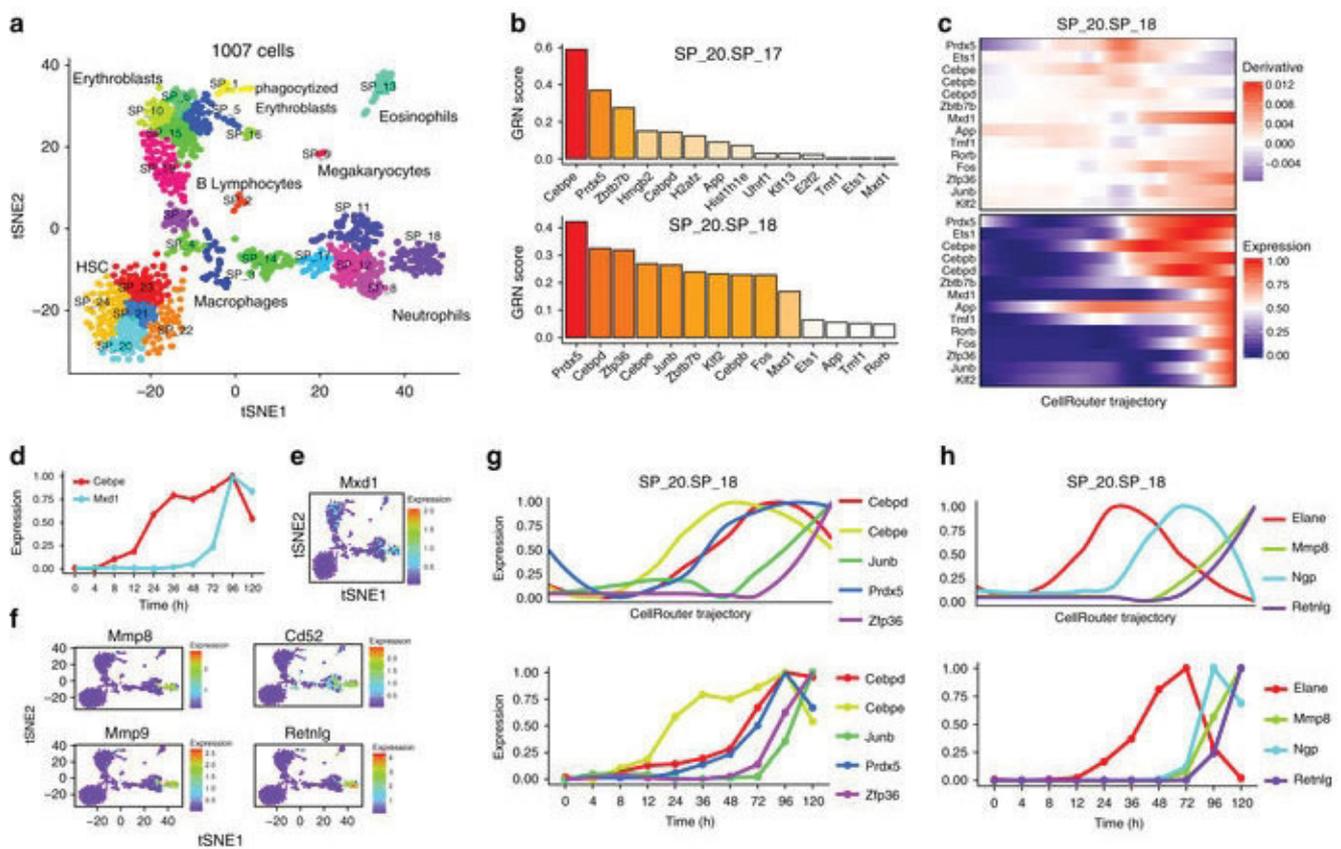
Step (4) Multi-state trajectories illustrate the divergence of single-cell transcriptomes along each trajectory progression. Identification of genes implicated in the dynamic biological process under study, such as differentiation, and identification of regulators driving or mediating cell-fate transitions at the gene and network level



CellRouter identifies transition-specific gene dynamics

We applied CellRouter to a mouse bone marrow single-cell RNA-seq data set (Supplementary Software 1). This data set contains a non-random sampling of bone marrow cells isolated by microdissection and also includes a purified Kit+Sca-1+Lin-CD48-CD150+ population enriched for hematopoietic stem cells (HSCs)¹². We identified 24 subpopulations, corresponding to a variety of cell types including HSCs, erythroblasts, megakaryocytes, neutrophils, basophils, macrophages, B-lymphocytes, and other intermediate subpopulations (Fig. 2a). Annotation of cell types was based on the original publication¹² and gene signatures identified by CellRouter (Supplementary Data 1).

Fig. 2



Gene expression dynamics during neutrophil differentiation. a t-SNE plot using genes reliably expressed as identified in the original study¹². b Predicted transcriptional regulators during cell-fate transitions from hematopoietic stem cells to neutrophil progenitors (subpopulation 17) and mature neutrophils (subpopulation 18). c Transcriptional dynamics from hematopoietic stem cells (subpopulation 20) to mature neutrophils (subpopulation 18). d Validation of the developmental timing of *Ceblpe* and *Mxd1* by bulk RNA-seq along a time-course of neutrophil differentiation. e t-SNE map colored by expression of *Mxd1*. f t-SNE maps colored by expression of *Mxd1* predicted target genes during neutrophil differentiation. g Kinetic trends of top regulators of transitions from HSCs to subpopulation 18 in b, top panel, and validation of these patterns by bulk RNA-seq during a time-course of neutrophil differentiation, bottom panel. h Genes known to be important in progenitor and mature neutrophils, top panel, and the validation of their expression dynamics using the time-course of neutrophil differentiation, bottom panel. Accession codes:

6

**Strategic
projects any
Business
can implement
in 2016**



8 Creative Businesses That Will Inspire the Artist in You

By Sammi Caramela

Art is a beautiful gift that plays more of a role in society than we realize. Without it, we wouldn't have books, movies, architecture, paintings and more. However, this doesn't make the business a simple one – just consider the "starving artist" cliché.

Though artists might be intimidated by the industry, it's not impossible to get off the ground as an art-based company. Businesses like these eight successful startups keep art alive and inspire fellow artists to do what they love.

Artsy

If you're an art enthusiast but don't have the time or money to travel to various museums, consider using Artsy, an online resource for art and museums. Artsy is a platform that features popular galleries, museum collections, foundations, artist estates, art fairs and benefit auctions in one place, according to their website. Their mission is to "make all the world's art accessible to anyone with an Internet connection." Keeping art alive and appreciated, especially in an increasingly digital world, is important to the industry's success.

Bucketfeet

Raaja Nemani and Aaron Firestein met and became friends while traveling through Argentina. Firestein drew a design on a pair of plain canvas sneakers for Nemani, who soon found his shoes were a popular conversation starter throughout his travels. This inspired the pair to start Bucketfeet, a company that sells canvas sneakers in a variety of styles that feature original art by more than 40,000 creators from 120 countries around the world. These artists cover every medium, from graphic design and graffiti to photography and painting, and anyone can submit their artwork for consideration by the Bucketfeet committee.

ImageThink

Based in New York, ImageThink makes art functional in the office and the classroom. The ImageThink graphic-recording team creates illustrations based on keynote speeches, presentations, strategy sessions and more to help audiences visualize and better remember the information they see. ImageThink team members create these illustrations live during the meeting or event to accompany the presentation. The business also offers its services for creating animated videos and infographics.



Instapainting

Have you ever posted a photo on Instagram that's so beautiful it could be a painting? With Instapainting, you can transform that digitally captured sunset or portrait into a real-life work of art. You can order either a mixed-media painting (the artist will print your image onto a cotton canvas and then hand-paint over at least 90 percent of the image with oil paints) or a 100 percent hand-painted painting (the artist will start from a blank canvas and paint the entire picture by hand with oil paints) based on your photo. Throughout the process, you can view all the progress and changes made, and talk directly with the artist. You'll have a finished product delivered to you from Instapainting within about three weeks.

JuicyCanvas

With JuicyCanvas, anyone can customize art, turning it into canvas prints, shirts, phone cases, tote bags, throw pillows and greeting cards. Juicy Canvas allows customers to select a medium and an original design, and then "remix" the piece into a custom product by altering colors, rotating and cropping the image and adding text. Artists can submit their work to be used on the site, and customers can easily search through the available designs by style and country of origin.

Meural

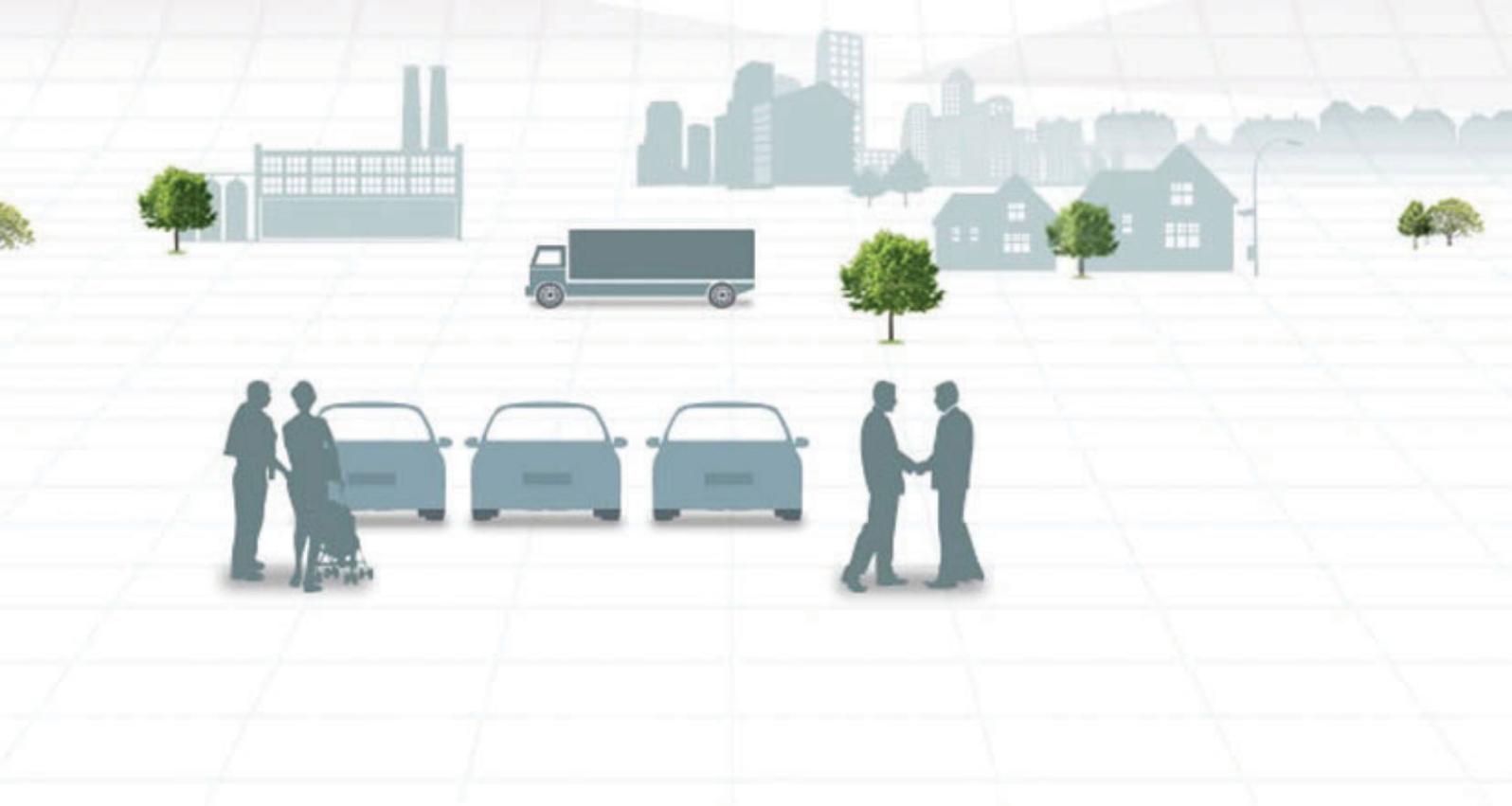
Ever wish you could have the works of your favorite artists at your fingertips? Meural offers that accessibility with a digital library of precious works of art, displayable in a "digital canvas" frame. Meural renders each image as lifelike and textured as a real painting, down to the last brushstroke, the site says. The canvas comes in a wooden frame. With a range of art collections from the Romantics to the Renaissance to Contemporary art and classic photography, there are more than 20,000 pieces (and the option to upload your own images) to bring a little culture to your home, office or art space. The website ensures it's easy to upload, curate and schedule images to display in your frame.

Tekuma

Art can transform a bare room into a gallery. With Tekuma, a Boston-area startup, anyone looking to enhance their interior design can choose from artwork by independent artists to decorate their home. They just snap a photo of their space and let the curators find content to match. Not only does this allow homeowners to display beautiful decor, it also promotes and rewards the artists.

TurningArt

Are you fickle about your home or office decor? TurningArt is an art-rental subscription service that allows you to select new art to feature in your home or office as often as you like, for a monthly fee. As a subscriber, you can search through thousands of pieces to find what you want, and the pieces are delivered to you at no extra cost. Your first order will come in a frame, and when you're ready for a new masterpiece, all you have to do is slide the old artwork out of the frame, send it back to TurningArt, and put the new order in. If you fall in love with a piece, you can purchase it through TurningArt as well.



Valuing
**Stakeholder
Engagement**
& Sustainability Reporting
By: **Mark Anthony Camilleri**

**STAKEHOLDER
ENGAGEMENT**
36th Edition 2018



Stakeholder

Engagement: A Core Component to Procurement Success

By: Megan Connel

Let's face it, Procurement personnel are not always the most popular people in the office. Procurement is commonly viewed as only being interested in cutting costs no matter the consequences for that department. There are some departments that are more resistant to Procurement than others – Marketing tops that list. Procurement has to overcome the obstacle of unwilling stakeholders before they can even begin their work.

As a sourcing and procurement professional, I can say that it's not all about the bottom line for us. While savings are important, we are equally interested in maintaining and/or improving the quality of the products and the relationships of your supply base. A solid Procurement team knows that savings must be sustainable – so for example, maybe switching suppliers will produce cost savings in the short-term, but if the product quality suffers and the company loses customers, the net profits will be lower. Savings can't equate to lost profits.

In general, Procurement has a bad reputation, but for those who understand the value that a successful sourcing initiative can bring to an organization, Procurement is viewed as an ally. It is essential for Procurement to win over the stakeholders they are working with; they will not be able to successfully do their job without it.

A core component to any sourcing or procurement project is establishing a plan for how the goals, objectives, and processes will be communicated to key stakeholders. Having the right communication plan for both stakeholders and suppliers can make a significant difference in the success of an initiative.

Why can't Procurement do its job without stakeholder engagement?

First of all, if end users (i.e., anyone with day-to-day interactions with the products/services) aren't on board with the sourcing initiative from the beginning, then why would they listen to you at the end when you tell them to start using a different supplier? Also, having the buy-in from upper management and key decision makers is critical to actually getting results implemented and ensuring compliance from end users.

Most important, without the key information about products, quality standards, specifications/requirements, value-added services, etc. that only end users have, Procurement will not be able to identify accurate substitutes or alternates.



There are a number of other reasons why having stakeholders on your side is important, and while it doesn't guarantee your success, it can almost certainly lead to your downfall without it.

In the article "5 Communication Tips for Procurement Initiative Success," Coupa describes the steps that organizations can take to champion their procurement initiatives and improve the chances of success. Some of their tips include branding your initiative to encourage people to back the program; being transparent and sharing all the successes and failures of the project as it progresses; and being prepared to answer the "what's in it for me?" questions from people resisting the change. Overall, the most important thing that Procurement can do to gain stakeholder engagement is to be transparent and explain its role/objectives.

Procurement needs to communicate to all those involved in the initiative that while reducing costs is important, improving processes and supplier relationships is another key goal of any sourcing/procurement initiative.

Speaking with stakeholders during the data collection process to understand what is most important to them as end users and knowing their wants and needs out of the initiative emphasize these goals. However, you must follow through and take this information into account during the sourcing process; otherwise you are back to square one.

As Procurement works with more departments and achieves results, more people will begin to see the value that Procurement professionals bring to organizations aside from cost-savings.

Without the engagement of stakeholders throughout the entire sourcing/procurement process, the chances of a successful initiative lessen. Procurement must work to communicate their goals and objectives to all those involved in the process from the beginning and establish open communication. Building trust with stakeholders will take time, but as some experts have noted, Procurement has already made progress in the eyes of many in recent years.



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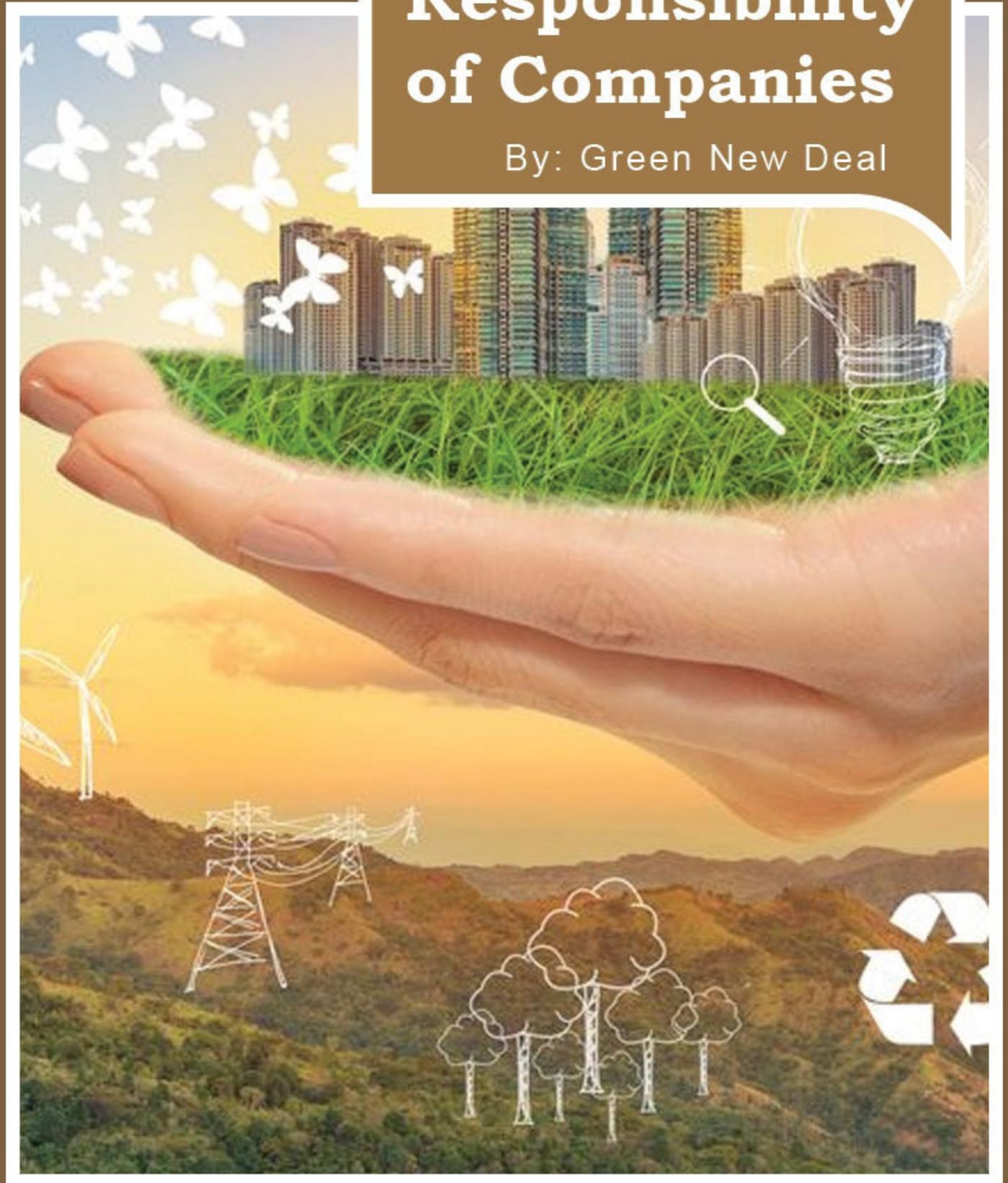
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CSR

The Societal Responsibility of Companies

By: Green New Deal



CSR REPORTING
SHOWCASE
36th Edition 2018



(CSR) – the Societal Responsibility of Companies

By: Green New Deal

The voluntary compliance of social and ecological responsibility of companies is called Corporate Social Responsibility (CSR).

Corporate social responsibility is basically a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment. Corporate social responsibility is represented by the contributions undertaken by companies to society through its business activities and its social investment. This is also to connect the concept of sustainable development to the company's level.

Over the last years an increasing number of companies worldwide started promoting their Corporate Social Responsibility strategies because the customers, the public and the investors expect them to act sustainably as well as responsibly. In most cases CSR is a result of a variety of social, environmental and economic pressures.

The term 'Corporate Social Responsibility' is imprecise and its application differs. CSR can not only refer to the compliance of human right standards, labour and social security arrangements, but also to the fight against climate change, sustainable management of natural resources and consumer protection.

The concept of Corporate Social Responsibility was first mentioned 1953 in the publication 'Social Responsibilities of the Businessman' by William J. Bowen. However, the term CSR became only popular in the 1990s, when the German company Betapharm, a generic pharmaceutical company, decided to implement CSR. The generic drug market is characterised by an interchangeability of products. In 1997 a halt in sales growth led the company to the realisation that in the generic drugs market, companies could not differentiate on price or quality. This was the prelude for the company to adopt CSR as an expression of the company's values and as a part of its corporate strategies. By using strategic and social commitment for families with chronically ill children children, Betapharm took a strategic advantage.

In July 2001, the European Commission decided to launch a consultative paper on Corporate Social Responsibility with the title "Promoting a European Framework for Corporate Social Responsibility". This paper aimed to launch a debate on how the European Union could promote Corporate Social Responsibility at both the European and international level.

The paper further aimed to promote CSR practices, to ensure the credibility of CSR claims as well as to provide coherence in public policy on CSR.



Responsible Companies in the Age of Globalisation

How a company perceives its societal responsibility depends on various factors such as the markets in which it operates, its business line and its size.

In recent years CSR has become a fundamental business practice and has gained much attention from the management of large international companies. They understand that a strong CSR program is an essential element in achieving good business practices and effective leadership. Companies have explored that their impact on the economic, social and environmental sector directly affects their relationships with investors, employees and customers.

For a long time, Corporate Social Responsibility was mainly promoted by a number of large or multinational companies. It is now also becoming important to small national companies.

Teflon Companies

Teflon Companies Shell was one of first companies to experience that early responsible action is better than crisis management after the fact. Shell was taken by complete surprise when the Greenpeace campaign against sinking the former drill platform Brent Spar achieved its goals. There was a widespread boycott of Shell service stations. The Brent Spar affair has brought quite a change of attitude to Shell.

As companies assess their brand in the context of globalisation, they are increasingly aware that Corporate Social Responsibility can be of direct economic value. Although the prime goal of a company is to generate profits, companies can at the same time contribute to social and environmental objectives by integrating corporate social responsibility as a strategic investment into their business strategy.

A number of companies with good social and environmental records indicate that CSR activities can result in a better performance and can generate more profits and growth. Research has shown that company CSR programs influence consumer purchasing decisions, with many investors and employees also being swayed in their choice of companies.

A major challenge for companies today is attracting and retaining skilled workers. There is not only an image gain for the companies using CSR, but it is also important for the employees. Within the company, socially responsible practices primarily involve employees and relate to issues such as investing in human capital, health and safety and managing change.

In India there are a small number of companies that practice CSR. This engagement of the Indian economy concentrates mainly on a few old family owned companies, and corporate giants such as the Tata and Birla group companies which have led the way in making corporate social responsibility an intrinsic part of their business plans. These companies have been deeply involved with social development initiatives in the communities surrounding their facilities.



Jamshedpur, one of the prominent cities in the northeastern state of Bihar in India, is also known as Tata Nagar and stands out at a beacon for other companies to follow. Jamshedpur was carved out from the jungle a century ago. TATA's CSR activities in Jamshedpur include the provision of full health and education expenses for all employees and the management of schools and hospitals.

In spite of having such life size successful examples, CSR in India is in a very nascent stage. In the informal sector of the Indian economy, which contributes to almost the half of the GNP and where approximately 93% of the Indian workforce is employed, the application of CSR is rare. On the contrary, the fight against poverty, the development of education, as well as the conservation of the environment are not existent in most of the Indian enterprises.

India has an advantage as far as labor is concerned. To some extent, business and capital go to those places where costs are less or standards are lower like the ones in India. But also in India, the demand for responsible and ethical goods is constantly increasing.

To guarantee the supply of responsible and ethical goods, it is especially important to implement a nationwide system of CSR standards.

How "Socially Responsible" are Companies in Reality?

Due to the lack of international CSR guidelines, the practical application of CSR differs and CSR Strategies within most companies still show major deficiencies. There are still complaints about multinational companies harming the environment and NGOs still denouncing human rights abuses in companies.

Some critics believe that CSR programs are undertaken by multinational companies in particular to distract the public from ethical questions posed by their core operations. While companies increasingly recognise their social responsibility, many of them have yet to adopt management practices that reflect it; company employees and managers need training in order to acquire the necessary skills and competence.

Pioneering companies can help to implement socially responsible practices by guiding the processes. The Copenhagen Centre and CSR Europe have recently launched a program to bring the business and academic community together with the aim of identifying and addressing the training needs of the business sector on Corporate Social Responsibility. While corporate social responsibility can only be taken on by the companies themselves, employees, consumers and investors can also play a decisive role in areas such as working conditions, environment or human rights, in the purchasing of products from companies that have already adopted CSR or in prompting companies to adopt socially responsible practices.

Critics suggest that better governmental and international regulation and enforcement, rather than voluntary measures are necessary to ensure that companies behave in a socially responsible manner. Corporate social responsibility should therefore not be seen as a substitute to regulation concerning social rights or environmental standards. In countries where such regulations do not exist, efforts should focus on putting the proper regulatory framework in place on the basis of which socially responsible practices can be developed.



International Initiatives for Corporate Social Responsibility

Why are governments interested in CSR? Their task is to make sure that the process of global and economic and social change is managed properly and fairly. Several guidelines or standards have been developed to serve as frameworks for CSR:

The OECD Guidelines for multinational Enterprises and the ILO - International Labour Standards form the principles for the societal responsibility of companies and will help to implement CSR on the international level.

CSR-Coverage

There is no unitary or binding international norm for CSR Coverage for companies. The Organization Ceres. Investors and Environmentalists for Sustainable Prosperity hopes for a greater engagement - as well as more transparency in reference to CSR. A Uniform reporting would besides reduce the possibility of "Greenwashing" – The Dark Side of Corporate Social Responsibility (CSR)".





Australian (CSR) - corporate social responsibility reports are little better than window dressing

Despite increasing visibility of corporate social responsibility (CSR) initiatives over the last decade, real change in corporate behaviour has tended to be modest.

This is clear from the sections in financial reports from Australian companies listed on the stock exchange that cover social and environmental initiatives. For example, only a fraction of Australian firms report transparently, using suggested guidelines when publishing annual reports. Instead, there are carefully tailored public relations documents, fancy media campaigns, and glossy reports that showcase the firm's social good deeds. This weighting of image over substance, and spin over objectivity, leaves us questioning whether social initiatives today are simply window dressing.

According to the longest running study of CSR by the Australian Centre for Corporate Social Responsibility, Australians believe that progress in CSR has remained slow and insufficient over the last decade. The same study reports that compared to ten years ago, today there is at least an awareness of CSR.

It seems the majority of Australian businesses are just aware rather than truly integrating CSR into what they do. For example, although Qantas focuses increasingly on addressing its approach to and role in global sustainability, the balance of its latest annual reporting on sustainability in 2016 seems predominantly about the emerging possibilities for Qantas, rather than reducing damage to the environment caused by the company's CO2 emissions.

Similarly, BHP states in its latest annual report that:

"Sustainability is core to our business strategy and integrated into our decision-making. It helps us live our charter values of putting health and safety first, being environmentally responsible and supporting our host communities".

However, the same report also informs about five fatalities and two significant community incidents in 2015 alone, as well as the disastrous Samarco tailings dam collapse in Brazil. It seems that the company is all talk and no strategic action.

Another example is ANZ bank, which sets its yearly and half-yearly sustainability targets in a separate sustainability report. But, while the bank's 2016 report shows that the organisation wants to improve its sustainability deeds, targets like "improving customer satisfaction ranking" are what the organisation should be striving for anyway in order to achieve its yearly profit.



In getting companies to do better, there are various motivations. This could come from increasing regulations, class action lawsuits, and social movements holding firms accountable not just for their misdeeds, but their very existence. An example of such jurisdictions is South Australia's "Punters Tax" where 15% of South Australians' losses will be payable in tax by online betting agencies, in part to assist with gambling addiction. We expect other jurisdictions to follow with similar taxes.

However good initiatives should also be encouraged and promoted. Working with communities to proactively mitigate the potentially damaging consequences of business activities can create significant long-term benefits for generations to come. For example, Fortescue Metal's commitment to training and employing indigenous workers could change the lives of thousands of young people in the Pilbara.

Judging from the CSR reports of Australian companies above, businesses here seem to have at least understood in the last decade that the social and natural environments within which they reside are intertwined with their own existence. But, as there is no national standard on exactly how deep CSR must be entrenched in Australian companies' strategies, the approach by even the largest firms towards CSR remains operational at best.

If firms truly want to incorporate CSR into their long-term strategy, then this is where CSR needs to sit right in the heart of the firm. Every action that follows, every move the firm does will then simply be a way of communicating this central cause.



The
2018

CORPORATE SOCIAL RESPONSIBILITY

Awards are open



**7th Corporate Social
Responsibility Awards**

January 25th, 2018 Marriott Hotel, Karachi



The 7th International Corporate Social Responsibility Summit & Awards by TPN held

50 corporate companies honored with CSR awards



Zubair appreciated the positive contribution of corporate sector to serve the underprivileged.

Karachi, Jan 25 (PR): Governor Sindh Muhammada Zubair has said that corporate sector is playing a vital role in building the nation by helping the underprivileged of our society. He was addressing at the **7th International Corporate Social Responsibility Summit & Awards by The Professionals Network held at a local hotel where 50 corporate companies honored with CSR awards.**

He says that neglecting the business community by the provincial government in Karachi is resulting in sense of deprivation among business community.

However the federal government would continue to play its due role in the welfare of traders and businessmen of Karachi besides enhancing industrial activities in the port city.

He said that federal government will address issues of business community so opportunities could be increased resulting in better business activities and employment.

A large number of people and members of corporate sector attended the ceremony. The program had six different sessions addressed by CSR members and professionals and people from NGO sector. They discussed the developments in healthcare, education, environment, sports and other social fields in private as well as government sectors.



Founder & CEO of TPN Mehmoond Tareen informed that this CSR event is the first and only IP registered CSR event of Pakistan and also having the copy right protection. We have received very encouraging response from participants and will continue to provide a professional forum for all stakeholders to discuss and promote CSR aiming welfare of community.





In opening session, Senator Abdul Haseeb Khan, Rashid Ahmed Siddiqui and Ateeq Ur Rehman addressed the corporate audience. Ateeq Ur Rehman appealed to financial institutions and corporate bodies to increase their CSR Budget , which is vital need of the hour . Further, CSR is a miracle and its support is badly needed by the deserving NGOs and humanitarian institutions.

Shireen Naqvi, Senior Associate, Carnelian on “From CSR to SSR (Sustainable Social Responsibility),” Dr. Abdul Bari Khan, Chief Executive Officer, Indus Hospital on “Vision of Indus Health Network with Present and Future Plans” and Fahad Ashraf , Chief Executive, Reckitt Benckiser shared his speech on the topic of “The Better way to do Business: Driving Business with a Purpose.”

As many as 50 corporate companies were honored with CSR awards in various categories on their exemplary CSR contributions during the year 2017. Chief guest of closing ceremony Anjum Nisar, Vice Chairman Business Man Group of KCCI distributed awards among the winners.

National Bank of Pakistan received three awards in the areas of health, education, sustainable development and relief categories.

An exclusive “CSR Gallery” was also displayed on the occasion comprising of 15 stalls. The corporate companies and NGO’s showcased their exemplary CSR activities & initiatives (local or international) for the promotion of CSR in Pakistan.

