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TRANSFORMATION AGE

SHAPING YOUR FUTURE

MHI Roadmap Series

Transformation Age: Shaping Your Future, the third publication in the MHI Roadmap Series, is intended to provide material handling, logistics and supply chain industry professionals insights into trends impacting success in the next 10 to 20 years.

TRANSFORMATION AGE

GLOBAL MARKETPLACE

People around the globe share responsibility for progress. How we utilize our strengths, our resources, our gifts and our knowledge will tip the scales of impact that mega trends bring our way.



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The world enters 2020 with the greatest promise and the greatest uncertainty of our time.

Mega trends and game-changing events will converge to create a pathway for opportunity, molded by choices made by individuals, organizations and nations.

Technology has already made the world a smaller place and altered the pace of life to one of dizzying change.

The return to a focus on space reminds us that there is much beyond our world to explore, discover and learn.

Citizens of all countries share needs and battles for natural resources, individual rights and freedom.

What's next is largely dependent on how humankind chooses to use technology, innovation and discovery, and how to relate and to care for one another.

It's a small small world

Disney had it right, many years ago. The world is small and... "there is just one moon and one golden sun." 1

People around the globe share responsibility for progress. How we utilize our strengths, our resources, our gifts and our knowledge will tip the scales of impact that mega trends bring our way.

The National Intelligence Council's latest Global Trends report, "Paradox of Progress," provides a view of the world out to 2035 where "The achievements of the industrial and information ages are shaping a world to come that is both more dangerous and richer with opportunity than ever before." 2

The report makes the case that, "Although material strength will remain essential to geopolitical and state power, the most powerful actors of the future will draw on networks, relationships, and information to compete and cooperate."

People and nations are interconnected as never before. With that bond comes responsibility for international cooperation and collaboration. A critical question for the future is how well that cooperation materializes and enables positive progress.

America

Interviews with supply chain industry leaders reveal general agreement with the NIC's view: within the world context, the United States' dominance draws to a close in the next five years and is replaced by emerging networks of nations, organizations and individuals. 2 The U.S. will wield significant power and be viewed as a leader of progress in many fields, but must learn to navigate in a different role in the coming decade.

This shift has implications for the entire planet, as the world enters 2020 with the greatest upheaval in international relationships since WWII.

INSIGHTS

- THE U.S. MUST LEARN TO NAVIGATE A DIFFERENT ROLE.
- ASIA WILL GAIN ECONOMIC POWER AND SHAPE GLOBAL TRADE.
- ADVANCEMENTS IN TECHNOLOGIES AND DIGITAL PLATFORMS WILL ENABLE GLOBAL COLLABORATION.
- EVOLUTIONARY ENHANCEMENTS IN ENERGY GENERATION AND STORAGE WILL ENABLE CHEAPER, CLEANER SOLUTIONS.
- THE NEW SPACE RACE OFFERS AN OPPORTUNITY FOR SHARED DISCOVERY AND INNOVATION AROUND THE WORLD.



"Look again at that dot. That's here. That's home. That's us."

Carl Sagan
The Pale Blue Dot, 1994 17

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This rebalancing brings opportunity for material handling and logistics as market trends generate increased demand for both domestic and international supply chain enhancements and innovative, new materials, processes and technology. A key driver will be the replacement of market share loss to emerging capabilities in Asia.

The wars of domestic and international politics will become increasingly important to the pace and impact of regulations, tariffs, and legislation in the U.S. and abroad.

Most economists agree that with the pain of the recession in 2018 still on the minds of industry leaders, investments are expected to be moderate throughout the first half of the decade. Sales driven by consumer demand and returns yielded from smart automation will be key drivers of investment.

Industry leaders point to a number of factors that need to be addressed to enable American companies to compete successfully in global markets. Foremost in their minds is the protection of intellectual capital, equitable treatment of imports and exports, and legal protections for business structures and funding. 3

Workforce preparation is a priority for global competition. Strengthening education and training resources in the United States will be vital to competing effectively in the global market. Investments at federal, state and local levels are needed to prepare the workforce for 2030 as well as 2040 and beyond. More private company investments in these fields will be required to serve industry and company needs.

The United States is strongly positioned to become energy independent, which would represent an historic shift and provide critical leverage with other nations. Already the world's largest natural gas producer, the U.S. has the potential to dramatically increase crude oil production as well. 4 Outcomes from debates over the environmental impacts of drilling may stall or derail progress in this field..

The Rise of Asia

The rise of Asia is driving a significant shift in economic power and prowess across the globe.

In many Asian countries, China in particular, government policies and growing infrastructure are driving domestic manufacturing and logistics to serve an increasing number of people and domestic markets. Less dependence on the West for goods and services will increasingly dampen imports from the U.S. and other countries.

The McKinsey Global Institute adds perspective; "The question is no longer how quickly Asia will rise; it is how Asia will lead." 5

The institute portrays Asia as "increasingly the center of the world economy. By 2040, the region could account for more than half of global GDP and about 40 percent of global consumption." 6

Bryan Jensen
Chairman & EVP, St. Onge Company



"Supply chain infrastructure and market conditions are changing around the globe. It is important to monitor these dynamics and adjust plans as changes occur."

McKinsey
Global Institute

"The Asian Century has begun. Asia is the world's largest regional economy and, as its economies integrate further, it has the potential to fuel and shape the next phase of globalization." 18

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McKinsey's research groups regions of Asia into four economic categories, based on scale, economic development, interactions with one another and connectedness to the world. 7



Source: Category groups from McKinsey Global Institute. Graphic by Burchette & Associates.

The World of Politics

Shifts in political leadership will have a tremendous impact on the coming decade. The combination of ruling party beliefs and personal leadership styles will color international relationships and the progress toward peace, health and prosperity for all nations.

The decade is beginning with a rough start.

Trade tariffs being used as political weapons in 2020 will further strain relationships among nations. Boundary disputes, weapons development and economic sanctions will heighten tensions.

Social and religious beliefs and differences will drive elections and either increase discourse or lead to greater harmony among political allies and enemies, which in turn will impact global commerce and supply chains.

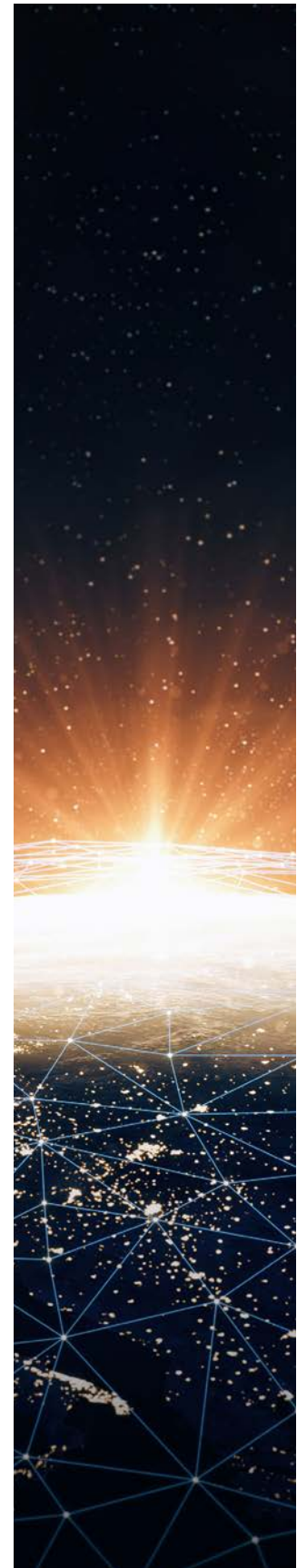
Resilience

Business strategies for dealing with uncertainty and change will be critical for managing successfully in the global market during the Transformation Age.

Dr. Suzanne Fry, a political analyst at the Central Intelligence Agency and former director, NIC Strategic Futures Group, says the key factor for a positive future is “resilience – in infrastructure, knowledge and relationships – for managing surprise and discontinuity.” 8

The NIC draws a key conclusion about the importance of resilience to success in the future in the “Global Trends, Paradox of Progress,” report:

“...The very same trends heightening risks in the near term can enable better outcomes over the longer term if the proliferation of power and players builds resilience to manage greater disruptions and uncertainty. In a world where surprises hit harder and more frequently, the most successful actors will be those that are resilient, enabling them to better adapt to changing conditions, persevere in the face of adversity, and act quickly to recover after mistakes.” 8



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NIC, Global Trends, Paradox of Progress

Global Demographic Trends

Humankind. There will be more of us. We will be older as a group and more diverse.

The United Nations predicts the world's population will increase by 2 billion people in the next 30 years. 9 Population trends will be varied around the world, but a number of key themes prevail: 10

Population Growth.

More people will inhabit the Earth, but with uneven growth and distribution around the globe. Africa will lead and Europe will suffer declines absent migration from other countries. The U.S. population will increase from 330 million in 2020 to approximately 350 million people by 2030. (US Census/PBS). China and India will continue to lead the world in population size, neck and neck with populations around 1.4 billion.

Older Demographics.

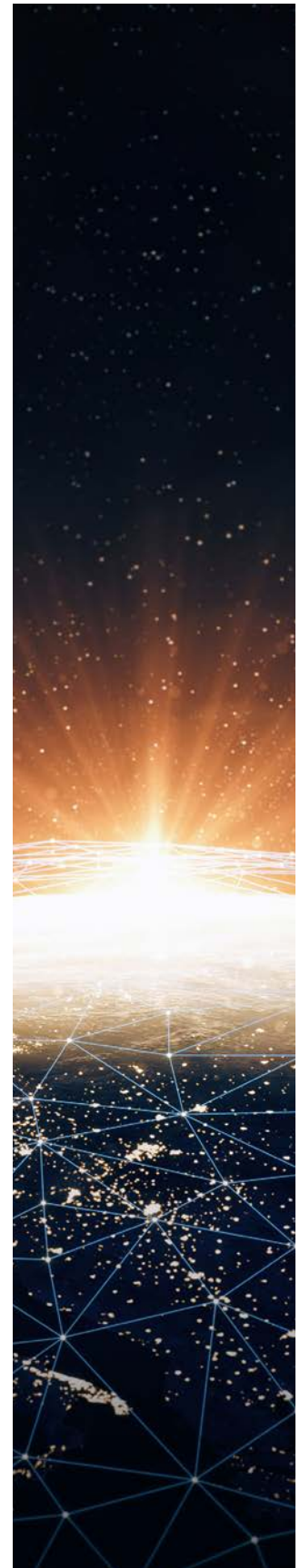
World population continues to skew to older ages, impacting consumer preferences, needs and demands. Workforce profile shifts continue, underscoring needs for career-long training and technology-enabled processes to lessen tasks requiring physical labor.

Urbanization.

Migration to urban centers continues worldwide, drive by those seeking work and adding infrastructure stresses and potential scarcities of food, water and energy.

Gender Imbalance.

Global trends continue with males outnumbering females due to birth selection and other factors.



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Minority Growth.

In the U.S., racial minorities, mainly Hispanics, are projected by demographers to grow the most, making them the primary driver of demographic change for the next 10 years and beyond. Whites under the age of 18 are already a minority in the U.S.

Human Health.

Advances in biotechnology will contribute to longevity and improved quality of health. Dudley Poston, writing for PBS, reports the number of centenarians in the U.S. will reach 130,000 by 2030. He calculates that in the year 2046, the first surviving Baby Boomers will reach 100, boosting category growth. U.S. Census data projections show the number of U.S. centenarians growing to 603,000 by 2060. 11

Graphic by Burchette & Associates

The Renewed Space Race

Growing interest and investment in space exploration and related industries will create opportunities for collaboration, competition, innovation and discovery across the globe.

Could this be the field that fuels common interests and helps countries act in concert?

Early initiatives show good progress in collaboration, with engineers, astronauts and other experts from different countries working together on initiatives related to the International Space Station. NASA reports the space station program “brings together international flight crews, multiple launch vehicles, globally distributed launch, operations, training, engineering, and development facilities; communications networks, and the international scientific research community.” 12

Development of new materials and processes in the pursuit of interstellar travel and commerce will enable technological advances in other fields such as satellite manufacturing, broadband technology, mining, textile fabrication and healthcare – all of which have impacts on Earth and create benefits for the material handling and logistics industry.

Growth in demand for technologies such as GPS in vehicles and drones, weather forecasts delivered to customized online maps, and low latency augmented reality (AR) healthcare procedures will fuel proliferation of stronger and better satellites. The supply chain will benefit from these advances as well.

NASA



Launched in 1998 and involving the U.S., Russia, Canada, Japan, and the participating countries of the European Space Agency, the International Space Station is one of the most ambitious international collaborations ever attempted. The largest space station ever constructed, the ISS continues to be assembled in orbit. It has been visited by astronauts from 18 countries- and counting. 19

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There are limits to the space we have to utilize for satellites in orbit around Earth, and those spots are filling up. More and more space debris is accumulating from man-made sources. Different nations will reach various planets and asteroids independently and collaboratively, gaining first looks and discoveries. How will nations work together to define space law and space policy around such issues? How will supply chain companies access new technologies and processes from various international sources? These and other questions reflect new frontiers in this field.

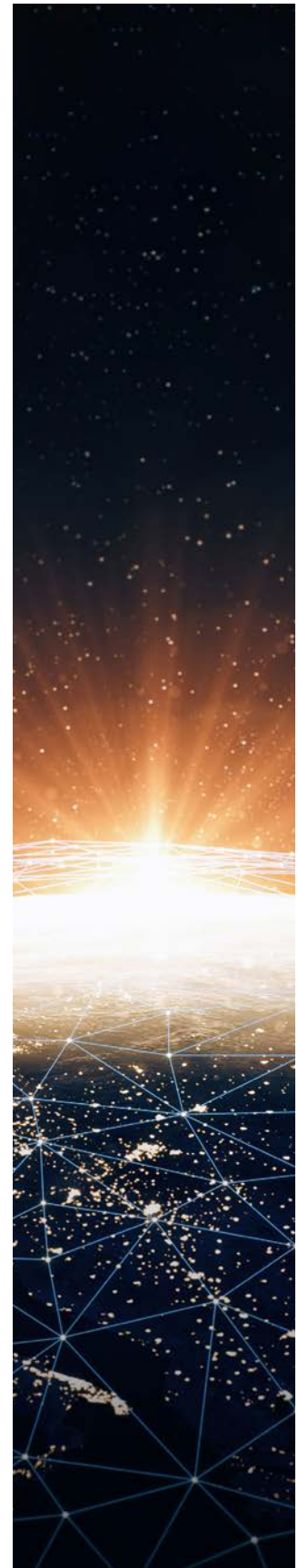
For more information on this topic, go to the section on the [New Space Economy](#).

Global Technology

Every nation stands to benefit from advancements in satellite systems, remote sensors, broadband capabilities, drones, AI and other technologies. Opportunities for collaboration – across a greater number of faster and increasingly less expensive platforms – will grow. Manufacturing and associated logistics will be optimized across markets, cities, countries and global supply chains as never before.

Industry leaders voice optimism at the opportunities technology will afford for entering new markets and improving supply chain logistics in territories where they operate today. Expectations run high for the progress to come in emerging economies that may skip over legacy approaches and jump to newer technologies as they become commercial realities over the decade. 13

Industry leaders also expect privacy and data security concerns to be dominant topics in discussions and initiatives involving global partners. Information sharing technologies, surveillance techniques, satellite tracking capabilities, and industrial and personal information sensors will all bring valuable information to companies, governments and their partners, while at the same time, creating doubts and conflicts over privacy, security and data ownership. 13



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Energy

The pursuit of ways to generate and harness energy is a common goal of all nations. The fuel of life, energy drives our factories, our homes, our businesses and our supply chains.

Vaclav Smil reminds us in his examination of energy and its impact on the world in *Energy and Civilization, A History* that “Energy is the only universal currency: one of its many forms must be transformed to get anything done.” 14

But the energy supply on Earth is not unlimited. Different forms of generation come with various consequences and trade-offs, limiting the realization of improved quality of life as energy sources and processes fuel progress.

To that point, Smil also reminds us, “Life’s two cardinal characteristics have been expansion and increasing complexity,” and asks, “Can we revise these trends by adopting the technically feasible and environmentally desirable shift to moderated energy use?” 15

Answers to that question will emerge over the decade.

Multiple direct and indirect factors will drive energy trends for the future. Increasing global demand to meet population, commercial and industrial needs comes at a time when planetary aspirations to meet a 2 degree climate goal bring pressure on sustainability impacts.

Advances in wind and solar generation will propel usage of those sources and battery technology will be widely used to support extended storage capacity and peak demands. The convergence of these factors will drive significant global changes in the way energy is generated, transmitted, stored and used. The resulting mega trend will create a rapid increase in the use of renewable sources that provide both cost effective energy solutions and a decline in carbon emissions.

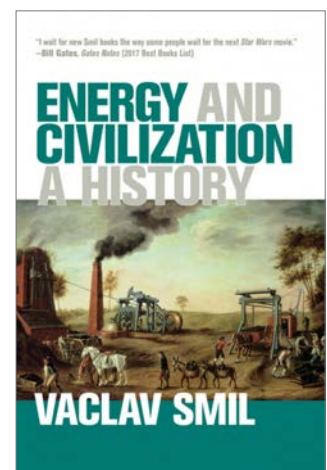
Supply chain leaders expect battery technology improvements to enhance factory and transportation equipment such as forklifts, electric delivery vehicles and drones. Expectations for future lower energy costs driven by solar and wind generation are moderated by concerns about expensive infrastructure requirements for both public and private sources over the decade.

Projections by BloombergNEF call for wind and solar to make up almost 50% of world electricity in 2050, with Europe “decarbonizing furthest, fastest.” The United States and China are predicted to follow this trend as well. 16

New energy technologies bring the need for domestic and international standards to ensure safety and compatibility of approaches. For example, common standards are needed for public infrastructure such as EV charging stations to support long-distance deployment of consumer and commercial electric vehicles.

The availability of minerals and Earth elements used in the manufacture of batteries and other energy technologies will be an important factor to all nations in the pursuit of enhanced energy infrastructure. The scarcity of some minerals will spur innovations in technology to utilize new, more plentiful sources.

Vaclav Smil
Author and Distinguished Professor
Emeritus, University of Manitoba



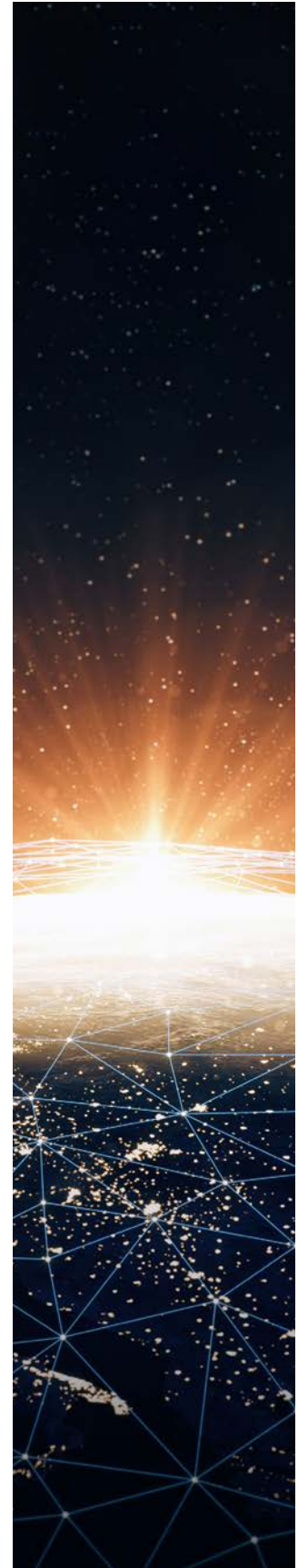
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Our Opportunity

The great promise of this decade is for global players and small town businesses and citizens alike to collaborate where possible and act independently when called to achieve life on our planet that is peaceful, prosperous and sustainable.

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Report Credits

The “Transformation Age, Shaping Your Future” report site offers information and dialogue on long-term industry trends for the material handling and logistics industry. As such, the information contained within serves as an invitation to engage in thought and discussion about key factors that are expected to drive, fuel and impact various aspects of life, commerce and industry in the coming decade.

Much of this information was gleaned from in-depth interviews with industry leaders and trend experts. Other data was obtained from secondary research of published material on specific topics. The combination provides insights into those forces that will impact the industry and, more importantly, the implications for action needed now and in the future by company leaders and their teams.

We wish to express thanks to all who gave their time and shared their experience, expertise and opinions for this report.

The report and website were developed by Burchette & Associates, Inc. for MHI.

For more information about this report, contact:
Emmy Lou J. Burchette
President & CEO
Burchette & Associates, Inc.
emmylou@burchetteandassociates.com

or

George Prest, CEO, MHI
gprest@mhi.org

Project Team

Research Design & Report Author: Emmy Lou J. Burchette
Research Specialist: Joe Coon
Copy Editor: Andrea Cooper
Website Project Manager: Karen Gafney
Website Design: Eric van den Brulle
Website Development: Geoffrey Atkin

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BURCHETTE & ASSOCIATES, INC.

P.O. Box 12706
Charlotte, NC 28220
burchetteandassociates.com
T 980.348.8435



8720 Red Oak Blvd., Suite 201
Charlotte, NC 28217
T 704.676.1190
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