

GLOBAL KNOWLEDGE CENTER

3D PRINTING AND RESHORING IMPACTS THE REAL ESTATE INDUSTRY

Robert Hess
Executive Managing Director, GCS

and

Bernard Hoefsmit
Executive Managing Director

with research update

by Karol Rybaczuk
Business Research Analyst
Global Knowledge Center

MANUFACTURING STILL MATTERS

BY ROBERT HESS

Executive Managing Director, GCS

January 2017

There seems to be a fervor of opinions these days about Trump foisting himself and his administration onto the task of reshaping the advanced manufacturing economy in the United States. This posturing is healthy for a couple reasons beyond the politics, the pros and cons of the economics, trade and tax implications, and even the perceived (and promised) jobs that will result.

Think about it.

Across the country, today's recent graduates are once again seeing a positive bent on making it in manufacturing. For decades this industry has taken it on the chin; commonly perceived as a second (or third) rate career alternative for those who can't cut it in college prep. Instead, today's up-and-coming talent pool are more excited than ever to get a firsthand view of what really happens inside a General Motors Original Equipment Manufacturing (OEM) plant or a Battery manufacturer or a food processing facility. Additionally, I suspect these individuals will be quite surprised by how much technology, precision science, and innovation go into deploying the factories of today (and the future). I should know. I have seen hundreds of these operations in my career and always leave with a sense of awe (as well as a new appreciation of how a certain widget or critical component is produced).

Critics speculate Trump's new "America first" push and tariff penalties will only impact manufacturing in the short term. Ultimately, we will see it fade away again as unskilled manufacturing jobs will be intermediated by automation and technologies like 3D Printing.

I say, do you know how many people it takes to write the software required for a robot on the assembly line? Or how many industrial engineers are necessary to troubleshoot an aseptic process in a food plant to protect the sterility of final product output? What about photonics, sophisticated metal substitutes and the visualization that goes into creating a new component or production line? No, not scores of blue collar workers but an incredible upstream of brain power and "know how" innovation, right here in the U.S. (not somewhere else).

Bringing back manufacturing to the U.S., albeit carefully and with great cognizance of our supply chains and innovation clusters that feed that manufacturing, elevates our entire economy, and challenges us to rethink what true economic value and good skilled jobs really entail.

RETHINKING PORTFOLIO STRATEGY IN THE AGE OF 3D PRINTING

BERNARD HOEFSMIT

Executive Managing Director

October-2017

3-D printing or - as it is perhaps more aptly called – additive manufacturing (AM) is maturing as a fundamental production method and shaper of corporate real estate (CRE) strategies.

As it becomes more likely that AM adoption will continue to expand, conventional manufacturing paradigms are being shattered, foundational processes are changing, and property and facilities management assumptions are following suit.

Additive manufacturing opens previously unforeseen possibilities for manufacturers, making it feasible to operate a network of small, nimble and specialized ‘micro-factories’ to produce products closer to the point-of-need. The production-on-demand promise of AM means warehousing square-footage requirements will fall significantly or be eliminated altogether for manufacturers. Likewise, virtual inventories and production-on-demand reduce the need for spare parts’ stocks, thus greatly decreasing the need for dedicated distribution warehouses.

Certainly, location strategies developed by CRE decision-makers will still need to evaluate production, warehousing, and distribution sites based on how suitable they are to serving essential customers and based on which locations offer the necessary staff and infrastructure. However, in the new AM paradigm more sophistication and analysis is required in order to optimize increasingly dispersed and complex real estate portfolios. Space requirements and location strategies need to be scrutinized to take full advantage of AM.

In the manufacturing sector, additive manufacturing’s challenge to long-established CRE axioms is causing decision-makers to closely reexamine their portfolio management philosophies. For instance:

In what would be considered a counter-intuitive decision in conventional manufacturing CRE models, it will likely be more economically feasible – in the AM model - to move manufacturing back to high-wage countries, where proximity-to-customer considerations outweigh the cost of labor.

Factories specializing in small series/spare parts production employing AM could be constructed locally and independently from factories in which conventional manufacturing is primarily practiced.

Disparate manufacturing processes could be bundled within a single facility. As AM reduces the need for different assembly operations the manufacturing process can be bundled within single facilities as e-plants or microfactories.

A network of ‘Print-Shops’ can be created by the manufacturer and/or 3D-Printing service providers to enable rapid provisioning of spare parts and customized products.

Space requirements for purchasing, waste disposal, and distribution warehousing will likely decrease – but not be eliminated - in an AM environment. Materials for printing, as well as final parts, will still need to be stored until they can be delivered to customers.

Of course, the magnitude of CRE change depends on the degree to which a manufacturing organization utilizes 3-D printing technologies. AM is certainly not suitable for mass-production operations. However, manufacturing organizations that do see the value - fast, precise, and low-cost production, short product development processes, and virtual inventories replacing physical inventories stored in warehouses – must be prepared to transform CRE thinking at its foundation, discarding long-held assumptions and paradigms that, while valid for conventional manufacturing, serve only to limit the possibilities at the core of Additive Manufacturing.



RESEARCH UPDATE

BY KAROL RYBACZUK

Business Research Analyst, Global Knowledge Center

November 19, 2018

Additive manufacturing is disrupting conventional production and construction supply chains as well as corporate real estate strategies. 3D printers are being gradually incorporated into building apartments and houses. A new eco-sustainable house model was introduced recently by the Italian company WASP. Using natural waste materials worth €900 and the Crane WASP printer, the company was able to build a house that has almost zero environmental impact in ten days.¹

Exhibit 1: Advantages of 3D printing and additive manufacturing for real estate



Faster creation of scale models for new developments



Lower costs of materials and transport



Shorter value chain



Greater customization and design freedom



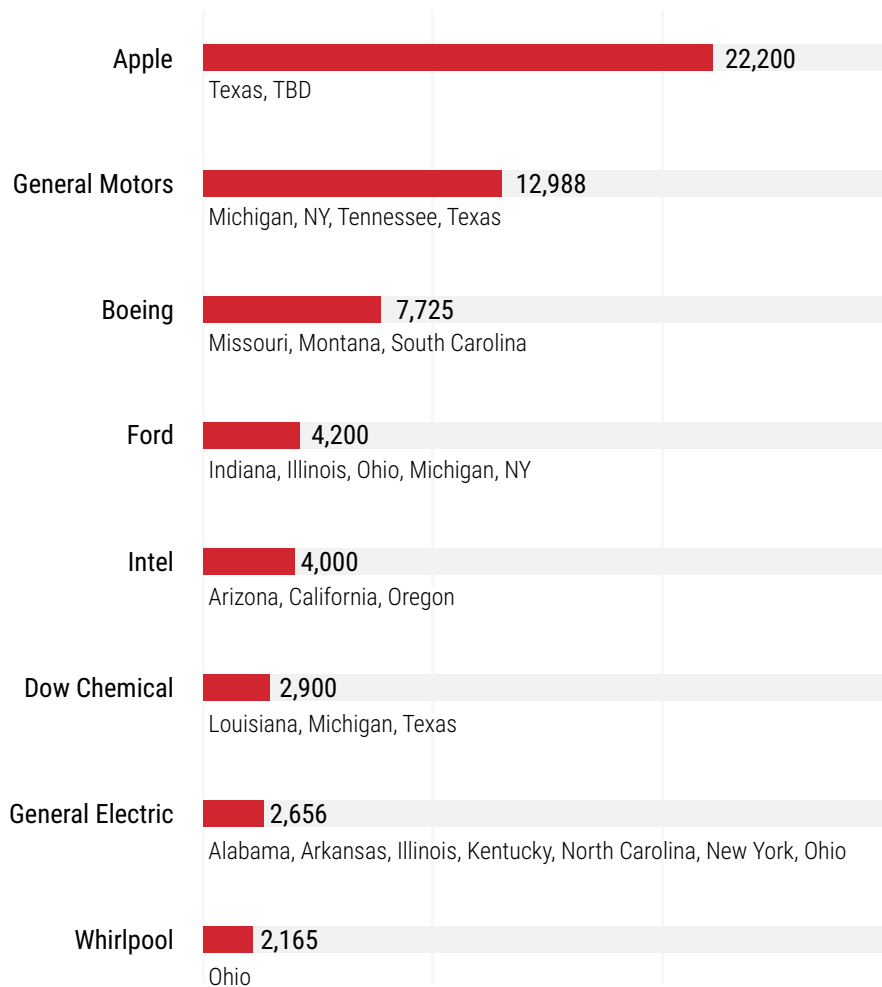
Less waste

Source: Global Knowledge Center Research

As a result of 3D printing, a growing number of companies are bringing their production back to U.S. The sixteen companies that had announced, or already started, the largest reshoring initiatives will bring approximately 73,000 manufacturing jobs back to U.S., according to data by Reshoring Initiative.²

Another recent report by A. T. Kearney shows that U.S. manufacturers are still importing from traditional offshoring countries. Manufactured goods imports in 2017 increased by 8.0% y-o-y, outpacing the gross manufacturing output in U.S. which had grown by 5.6% y-o-y.³ It seems that as long as economic benefits of overseas production are not tampered by international trade tensions, U.S. companies will not retreat. Manufacturing is not yet at the same stage as the services sector, but automation is likely to accelerate the reshoring process when these low-skilled and labor-intensive jobs move back to the U.S. and become more accessible.

Exhibit 2: The largest reshoring initiatives in the U.S. by total jobs reshored (2010 to Q1 2018) and states benefiting



Source: GKC research





BIBLIOGRAPHY

1. WASP. The first 3D printed House with earth. WASP, September 2018. Available at: <https://www.3dwasp.com/en/3d-printed-house-gaia/>. [Accessed November 19, 2018].
2. Comen, E. Which manufacturers are bringing the most jobs back to America? USA Today, June 2018. Available at: <https://eu.usatoday.com/story/money/business/2018/06/28/manufacturers-bringing-most-jobs-back-to-america/36438051/> [Accessed November 19, 2018].
3. Abraham, A., et al. Reshoring in Reverse Again. A.T. Kearney, July 2018. Available at: <https://www.atkearney.com/operations-performance-transformation/us-reshoring-index>. [Accessed November 19, 2018].



NEW YORK

HEADQUARTERS

125 Park Avenue
New York, NY 10017
212.372.2000

RAJEEV THAKUR

Executive Managing Director

Head of Global Knowledge Center

571.230.0242

rthakur@ngkf.com

NORTH AMERICA

Canada
United States

LATIN AMERICA

Argentina
Brazil
Chile
Colombia
Costa Rica
Mexico
Peru
Puerto Rico

EUROPE

Austria
Belgium
Czech Republic
France
Germany
Ireland
Italy
Netherlands
Poland
Portugal
Romania
Russia
Spain
Switzerland
United Kingdom

ASIA PACIFIC

Australia
Cambodia
China
India
Indonesia
Japan
Malaysia
New Zealand
Philippines
Singapore
South Korea
Taiwan
Thailand

AFRICA

Botswana
Kenya
Malawi
Nigeria
South Africa
Tanzania
Uganda
Zambia
Zimbabwe

MIDDLE EAST

Saudi Arabia
United Arab Emirates