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Effects of smart manufacturing announcements on companies' stock market value: a perspective of supply chain collaboration

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ABSTRACT

Announcements related to smart manufacturing in the Middle East and the world at large have impacts on the stock market of the company given the political, economic and industrial context. The Middle East in particular has given its intention to diversify from an oil-based economy and smart manufacturing plays a critical role in the transition. Investors tend to believe that smart manufacturing initiatives will lead to innovation, increased efficiency and the larger goal of more profitability. This paper analyses smart manufacturing and the impact it has on the company, stock market and the economy. It also highlights other factors that can easily influence the nature of the outcome of the announcement.

Keywords: Announcements, smart, manufacturing, stock market, economy, profitability, operational, government, Middle East, technology, implementation, fluctuation, competitive, quality, information, data, control, production, IoT, transparency, contract

INTRODUCTION

Smart manufacturing as defined by the National Institute of Standards and Technology (NIST) is a "fully-integrated, collaborative manufacturing system that responds in real time to meet changing demands and conditions in the factory, in the supply network, and in customer needs". TechTarget simplifies the definition to a discipline in manufacturing where engineers analyze a set of machine data obtained from sensors to improve operational efficiency and avoid downtime. A report conducted by (PWC) Price water coopers in 2016 indicated that smart manufacturing integration was at 41% in Middle East while the global average was at 33%. This percentage was forecasted to grow to 62% by 2021. However, it was noted that not all adoptions were successful as whole challenges are faced in the implementation phase. As of March 2024, studies reveal that 87% of countries in the UAE have invested or plan to invest in smart manufacturing. The government has invested $26 billion to rapidly grow the manufacturing and technology sector.

Below is a chart showing challenges facing the implementation of Industry 4.0 (source:2016 Middle East Industry 4.0 Survey.

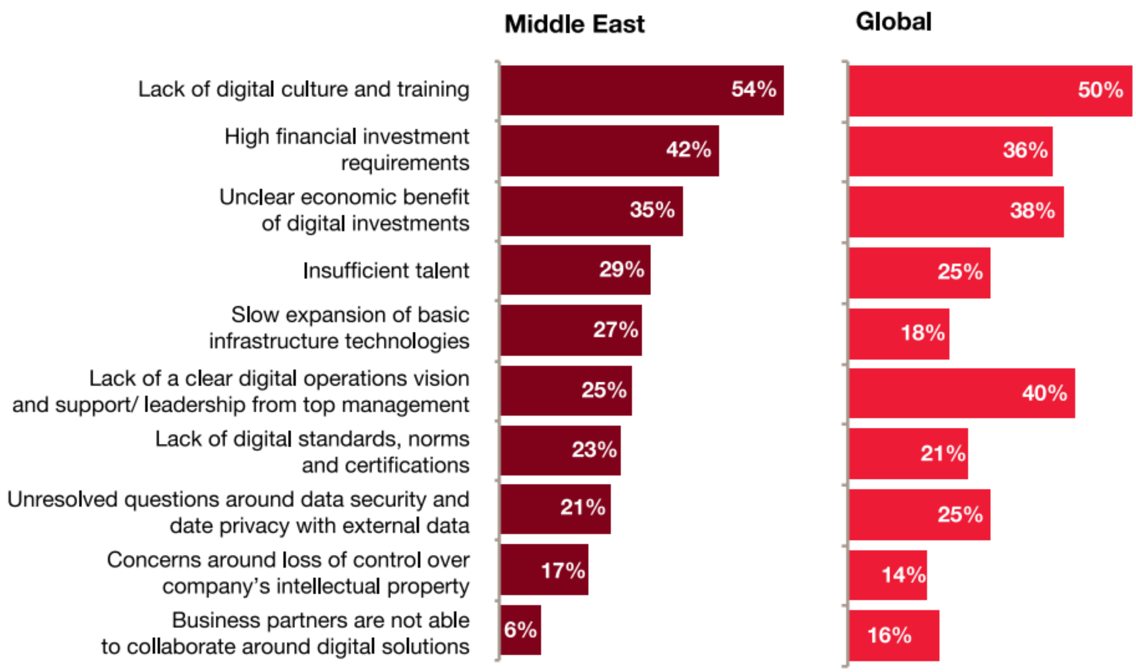

Chart 1: Challenges facing the implementation of Industry 4.

Stock market has attracted a great deal of attention due to its factor in financial development and also as a measure of economic growth. In the past few years, stock markets in the Middle East have experienced large fluctuations.

Smart manufacturing has successfully enabled supply chains and firms to adopt faster to the new competitive environment. Firms have gained better control of the triple constraints of manufacturing which are lead time, cost and quality where else gaining better flexibility through the method. Smart tags with manufacturing information have transformed the traditional information control that is delayed to real time data control which is used to improve production quality and efficiency.

UAE and Israel are leading the way with industry 4.0 across the Middle East. The key features of the revolution are smart factories, automation & robotics, data-driven decision making, customization and flexibility and advanced connectivity. "Make it in the Emirates Forum" is one of the forums the UAE has been using to propel the uptake of smart manufacturing. Dubai's TECOM group has been on the forefront to optimize energy use by using IoT in smart manufacturing. Yahsat Emirati satellite communications also uses AI for data analysis. Abu Dhabi National Oil Company has also implemented smart manufacturing technologies across its operations. Ras Al Khaimah, one of the largest quarrying companies has not been left behind to demonstrate that the methodology can be adopted across different industries with positive impacts.

LITERATURE REVIEW

Stock markets play a huge role in the financial development and economic growth of a region thus the need to understand how smart manufacturing affects it. The two items inter relate as financial deepening promotes economic growth and economic growth spurs financial development. The stock markets are also affected by institutional and macroeconomic factors. Institutions bring about transparency, contracts enforcement and protection of property rights building confidence to the investors and experiencing capital markets growth. Good governance in the institution and an efficient judicial system has been a big win in the stabilization of stock markets in our country. We also have quality accounting firms with solid reports of low-risk contradiction supporting the system.

In the UAE the two main exchanges are Dubai Financial Market (DFM) and Abu Dhabi Securities Exchange (ADX). DFM is more active with companies such as Emaar properties, Air Arabia, Dubai Islamic Bank listed there. It focuses on real estate, tourism and banking. ADX focuses on energy, telecommunications, and financial services with giants such as Abu Dhabi Bank, TAQA and Etisalat listed.

The stock market has been on a steady growth post-COVID recovery backed by government reforms, strong corporate earnings and investor's confidence. UAE being strategically located and with a stable political environment attracts foreign investors. Other factors that have brought significant developments in the stock market have been initial public offerings and the ESG policy on environmental, social governance which is a global trend.

Macroeconomic factors affecting the stock market include income, saving rate, stock market liquidity and financial intermediary development. On the flip side, it has been established that inactive stock markets lead to higher inflation levels. The region in the Middle East due to its natural resources reserves attracts foreign direct investments which have contributed significantly to economic development and stock market growth.
Higher income levels have a positive impact on stock market capitalization as it is associated with good institutions. The business cycle mechanics also dictate that companies quoted to be flourishing in the market attract more consumers to invest. Income level is a measure of the GDP.

Investment is the ratio of gross fixed capital formation to the GDP and it affects the stock market capitalization as the intermediate savings determine the investment projects that can be carried out.

Inflation change is the measure of macroeconomic stability and with high inflation the price volatility is high. In times of uncertainty people will have less interest in trading consequently having a negative effect on the stock market.
Domestic credit policies have an effect on the stock market as they determine the role and capacity banks have in long term financing.

A study done by (IMF) international monetary fund named as IMF Working Paper (WP/07/157) by Andreas Billmeier and Isabella Massa in 2007 showed that good institutions and remittances contribute significantly to the stock market while in hydrocarbon-rich economies such as the UAE they have little to no significant. Rather, oil prices have the largest impact on the stock market price. It also noted that countries without the natural resources' reserves enjoy better stock market value where institutions have been strengthened.

The UAE has positioned itself to be a tech giant by moving away from the traditional oil-based economy to a technology driven economy where the world will rely on. This is evident given the strategies the government has put in place such as the Saudi Vision 2030 and UAE's fourth industrial revolution.

The chart below shows the benefits Middle East will experience from digitization in the next 5 years.

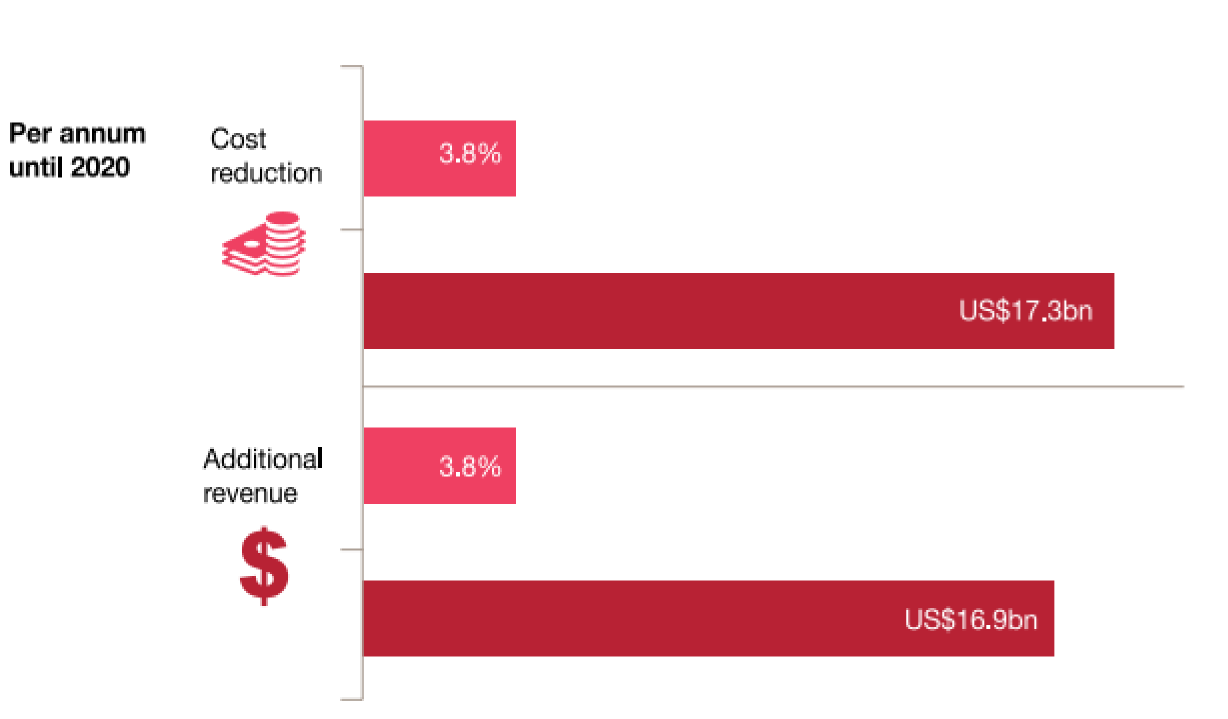

Chart 2: Expected benefits from digitization over the next five years

Positive effects of smart manufacturing announcements.

Below is the expected reaction on smart manufacturing effects, social interpretation and the likely impact on the stock market.

Alignment with the countries vision

Saudi Arabia and the UAE have launched ambitious diversification plans for the economy. Smart manufacturing announcements position a company strategically by aligning itself with the nation's vision. Both domestic and international investors will develop special attention to such initiatives leading to increase in the stock price. The picture displayed is of embracing technology and positioning the company for growth in the region to stand out.

Attracting foreign direct investment (FDI)

The world is forging towards modernized technology and adopting smart manufacturing initiatives. A company captures attention of the tech-driven economies and attracts international investments and partnerships. A move towards automation is received well the local government and company enjoys grants, incentives and foreign investments. The aforesaid boosts investors confidence creating a share demand and in turn an increase in the stock price.

Market leadership

A good number of companies in Saudi have adopted smart manufacturing, however in regions or industries with low uptake of technology announcing the transition into smart manufacturing will make a company create a name and brand as a trailblazer in the field. Pioneers often create a good name for themselves as society views them as forward-thinking and better equipped to adopt and handle the future market trends. Positive sentiments towards companies attract investors who add value to the stock market.

Enhancement of Logistics and Infrastructure

Countries in the Middle East have invested heavily in infrastructure projects such as industrial zones and smart factories. Smart manufacturing initiatives create a perception that new opportunities are being created that will reduce the cost of production and optimize the supply chains. Investors are lured by such strategies and initiatives and will lead to potential stock value appreciation.

Growth in Non-Oil Sectors

Middle East has been known to be heavily reliant on the oil sector. Uptake of smart manufacturing in other industries such as logistics, aerospace and pharmaceuticals signal growth potential in the long run. Smart manufacturing involves automation, robotics or IoT and investors anticipate profit gains as the initiatives are associated with efficiency and global competitiveness.

Long term growth prospects

Smart manufacturing announcement is a clear indicator that a company is investing into the future. The technology enables goods to be produced more efficiently, with fewer errors. Production capacity and ability is also improving as greater levels of customization can be achieved. Such systems are very promising and long-term profitability can be assured. The benefits that come along lead to improved stock prices.

Increased productivity

Smart manufacturing is often associated with better machinery which leads to improved productivity and output quality. Quality attracts higher demand signaling higher revenue and profits which in tandem propel the stock prices higher.

Sustainability Appeal

Smart manufacturing also considers eco-friendly and sustainable production practices. The globe is currently advocating for measures and policies that will enhance environmental protection and conservation. The human population is also very conscious of environmental degradation and is willing to invest and fund companies that go the sustainable way. As a ripple effect we witness appreciation of the stock value.

Likely shortcomings on company's announcement of adoption of smart manufacturing

Smart manufacturing also has a downside as we analyze below.

High initial costs and investors caution

Smart manufacturing as well as technology uptake is a high capital-intensive exercise. Especially a large-scale transformation necessitates high initial investments where else the returns are not immediate. Investors in emerging markets will act cautiously for obvious reasons if they perceive the investment costs outweighs the benefits. This may potentially lead to stock price dip.

Volatility in oil prices

The transition to a non-oil dependent economy is on course but the dependence on the oil industry is still high. Oil thus commands the stock price and oil prices fluctuations will easily overshadow the benefits of smart manufacturing. Stock price movements can be highly neutralized when oil prices fall and an announcement of smart manufacturing is made thus making the company not to enjoy the above fore listed benefits.

Political and regulatory risks

Political stability and government regulations play a huge role in the stock market. In Saudi Arabia we enjoy good political environment and regulations thus smart manufacturing announcements will have a positive impact. However, in other countries with political risks, geopolitical tensions and regulatory hurdles investors hesitates making investments despite new technological upgrades in the companies.

Limitation of skilled workforce

Smart manufacturing comes along with new equipment, machinery and technology. It is crucial to have skilled workforce which will be able to run, operate and manage the systems. In some remote countries investors may have doubts when new technology is adopted and the workforce is limited in the operation of the resources. As such, the stock market demand will not be felt.

Smart Technology uptake effects in Middle East and the World at Large

Saudi Aramco is the second largest company in the world by revenue and a trailblazer in the technology world. Digital transformation has revolutionized how they supply energy to the world by deploying a range of 4IR technologies to meet energy needs, enhance productivity, reduce carbon emissions and create next generation products. Some of the technologies adopted in the oil and gas industry include artificial intelligence, block chain, digital twin, robotic process automation, clouds, IOT, IIOT, robotics & drones, virtual/augmented reality and 3D printing. Forbes recognized Aramco as an early adopter of smart technology. The company experienced significant stock appreciation when it announced early investments in advanced technologies as investors anticipated efficiency of the refineries and manufacturing processes resulting in company profitability.

Dubai Electricity and Water Authority (DEWA) is another company that has embraced smart manufacturing and automation technologies. The adoption aligns with Dubai smart city goals on its utilities and infrastructure. Its stock prices have also been impacted positively by the move.General Electric (GE) is among the first companies that adopted smart manufacturing and digital transformation. In early 2010s, they made a major announcement on smart manufacturing and the stock prices rose as investors viewed the efforts as strategically positioned for the company's growth. Tesla is another company whose stock price has been highly influenced by its advanced manufacturing techniques. Production upgrades and gigafactories set ups always have investors adrenaline high signaling expansion, cost reductions and as a result increased profit margin.

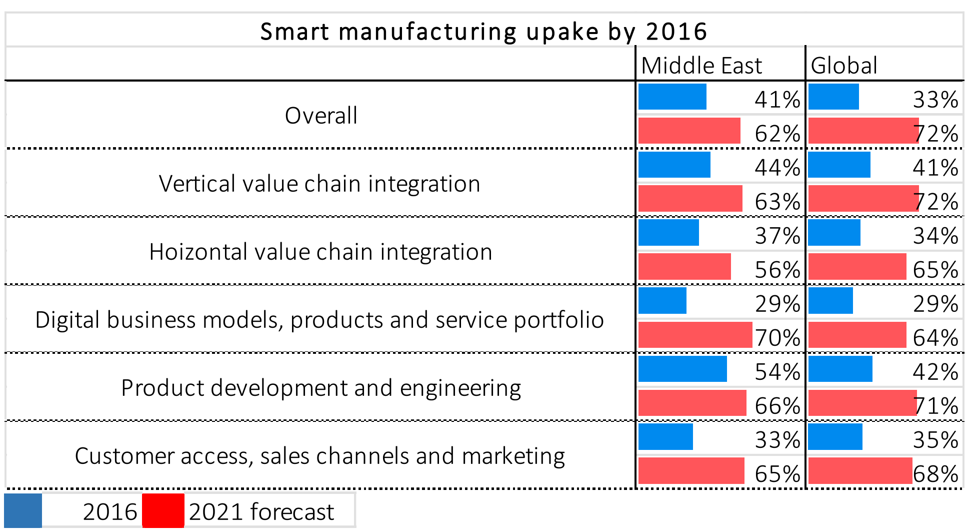

Chart 3: Smart manufacturing uptake between 2016-2021

Besides the benefit that smart manufacturing has on the stock market, below are also other benefits fueled by the adoption

i. Increased productivity and efficiency
ii. Reduced downtime and maintenance costs
iii. Increased capacity of creating new products and services
iv. Better product quality and assured consistency
v. Increased agility and responsiveness to market changes.

CONCLUSION

In the Middle East it is evident of the positive impact smart manufacturing announcements have made on the stock market value. This has been supported by the national development strategies and diversification goals which align with smart manufacturing initiatives. With all said and done, companies must strike a balance between the long-term benefits and risks associated such as high initial investment cost. There are also other factors that affect the stock market which must be analyzed as announcements on uptake of smart manufacturing must not always result in a positive impact to the company. Most of the investors give more weight on the efficiency and company profitability rather than the new technology. Therefore, adoption of smart manufacturing should focus on efficiency and profitability.

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