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Master thesis for the track
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Topic: An update of the megatrends and their implication for procurement.

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Soran Bapeer

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1. Introduction: Do firms still need to prepare their procurement to deal with the future megatrends that were determined in 2011 or have these changed?

Megatrends are large, transformative global forces that impact everyone on the planet.[1] Megatrends are long-lasting social and or economic changes that can be caused by influences such as technological breakthroughs, changes in the balance of geopolitical power, demographic influences and environmental changes.[2]

In 2011 research was done on the megatrends and their implications for procurement. In this research five megatrends were determined by h&z consulting and analysed for this research. Firstly, the importance of the procurement megatrends for firms was analysed. Followed by the second subject which is to what extent the perceived importance of the megatrends for procurement influence firms' actions. Ending with the last subject, to what extent the implementation of firms' actions in order to prepare for the megatrends influence firms' market performance. The Five determined megatrends where:

1. Increase of environmental and social responsibility
2. Demographic change
3. Acceleration of technological progress
4. Changes in political and macroeconomic environment
5. Shift of economic growth centres

In 2011 Möller started his thesis "A critical review of the megatrends and their implications for procurement". During the Congress 'Trends for the future' in Nyenrode, the Netherlands 346 participants were handed a survey which 209 of them filled in.[3] The survey showed several results. The participating procurement managers evaluated the megatrend about acceleration of technological progress as the most important one. The analysis also showed that 25 per cent of the best performing firms showed that these firms see the megatrends as an important tool to prepare their business in the future. The survey also showed differences between the results of manufacturing and service firms with regard to the megatrend about shit of economic growth centres and the preparation for this megatrend, the establishment of local sourcing offices. [4]

It has been seven years since this research was completed and a great deal might have happened that could either change the megatrends or they hold up today and are firms still aware of the future changes and have they prepared themselves for it. For the purpose of this research the megatrend where put under a scope to determine if the same megatrends still hold up today. Chapter two will give an introduction to the megatrends. In chapter three the megatrends are illustrated and critically reflected. Chapter four will describe the research methodology. Chapter five will describe the timetable for the thesis. In chapter six the results of the survey are discussed. In chapter seven the discussion and conclusion can be found and

[1] See Schreiber. (2015), p. 1.
[2] See O'Sullivan. (2013), p. 2.
[3] See Möller. (2011), p. 61.
[4] See Möller. (2011), p. 72

in chapter eight the limitations and future recommendations. Finally, chapter nine is reserved for the bibliography and further for the appendix.

1.1 Research questions.

The five megatrends of the last research were determined in 2011, it is needed to look into the current state of these megatrends. Do these five megatrends still hold today for the future or have they changed? So, the first question is:

- *Are the megatrends determined in 2011 still the same future changes that hold today?*

The next question regards the importance of the megatrends for procurement? And this question reads:

- *What is the importance of the megatrends for procurement?*

The following question will be about the most important megatrend and the type of respondent.

- *Which megatrend is perceived as the most important trend for the future and is there any significant difference in the type of respondent?*

2. Literature review: Megatrends

2.1 Megatrends introduction and classification of trend types

In order to address the first aim of identifying consensus on megatrends a literature search on the term 'megatrends' was conducted. Since the academic literature on megatrends is limited, the approach focused on internet search engines rather than academic databases. In 1982 John Naisbitt introduced the concept of megatrends. John Naisbitt describes megatrends in his book 'Megatrends 2000' as slow forming large social, economic, political, and technological changes. Once these changes are in place they influence us for some time, between seven and ten years or longer.[5]

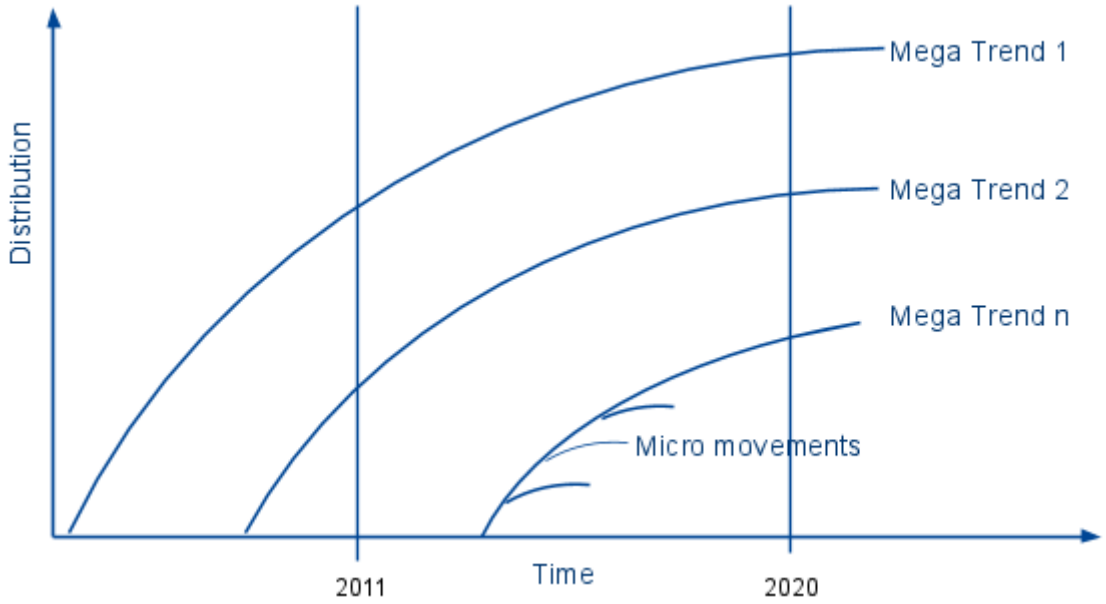
2.2 Central component

2.2.1 Micro trends: each megatrend is formed out of micro trends

Each megatrend is formed out of several micro trends. Megatrends are formed of a series of micro trends that build upon one another.[6]

[5] See Naisbitt. (1990), p. 12
[6] See Schiele et al. (2012), p. 2

Figure 1: Micro trends graph



Source: Megatrends 2022: Implikationen für den Einkauf

Mark J. Penn describes micro trends as small steps in the big process of changes. The micro trends theory is based on the idea that the most powerful forces in our society are the emerging, counterintuitive trends that are shaping tomorrow right before us.[7]

[7] See Wilson. (2008), p. 49

2.3 Recent application of megatrends: Illustration of elder studies of academic and non-academic studies on megatrends

The search for the identification of megatrends resulted in work from several firms in the professional service sector. Price Water Coopers (PWC) describes megatrends as macroeconomic and geostrategic forces that are shaping the world. They are factual and often backed by verifiable data. By definition, they are big and include some of society's biggest challenges and opportunities.[8]

The indicated megatrends by PWC are:

- Shift in global economic power

A rebalancing of the global economics is happening, and the focus of global growth has shifted towards emerging countries. China for instance is expanding their economic presence and is investing in resources from Africa and the North Sea.[9]

- Demographic shifts

Extreme population growth in some areas is and decline in others is causing shifts in economic power and resource scarcity. Ageing has become an issue, as of 2050 21 per cent of the world population will be 60 years and older.[10]

- Accelerating urbanization

By 2030 the United Nations estimates that 4,9 billion people will live in the cities. The number of megacities is already increasing. Much of the urban population growth is already taking place in Asia and Africa. Smart cities will emerge, using cloud technology, mobile devices, data analytics, and social networks to automate and connect city departments and promote eco-friendly practices.[11]

- Rise of technology

Artificial intelligence, nanotechnology and other frontiers of research and development are opening up opportunities for new investments.[12]

- Climate change and resource scarcity

The demand for energy will increase with 50 per cent by 2030 and water withdrawals by 40 per cent. The world is changing, sea levels are rising as a consequence political, religious, ethnic tensions will increase due to scarcity and environmental threats.[13]

The European Union Institute for Security Studies (EUISS) has written the report "Citizens in an Interconnected and Polycentric World" in which they have determined several global trends for 2030. These trends are not predictions for the future according to EUISS, but rather

[8] See Modly. (2016), p. 1.
[9] See Modly. (2016), p. 3.
[10] See Modly. (2016), p. 8.
[11] See Modly. (2016), p. 12.
[12] See Modly. (2016), p. 16.
[13] See Modly. (2016), p. 20.

existing trends that are likely to shape the future.[14] The EUISS is an agency dealing with the analysis of foreign, security and defence policy issues. The EUISS has determined three main global trends, which are:[15]

1. The empowerment of individuals.
2. Greater human development but inequality, climate change and scarcity.
3. A polycentric world but a growing governance gap.

1. The empowerment of individuals is caused mainly due to the emergence of the middle class and particularly in Asia, near universal access to education, the effects of ICT and the change of status of women in most countries. [16]

2. Human development is greatly improving, this can be seen in the middle class emerging in several countries, but inequality is still an issue that has no intentions to decrease. According to EUISS climate change will have serious consequences on the way people will live. Safety and living standards will be affected and worsen water and food scarcity. [17]

3. Power shift to Asia comes with a great uncertainty. China is planned to become the largest economic power in the world with a 19 per cent share of world gross domestic power. There will be a shift in economic power to China and India from the US, Europe and Japan. The United States will likely remain the strongest military power, China is increasing their military as well.[18]

Global megatrends are just not the important problems facing governments. While you can see that problems differ between countries, the megatrends are on a larger focus shaping the policy choices available to governments to deal with emerging issues. Global megatrends are not short-term problems they are at least 20 years. Megatrends have a worldwide relevance impact.[19]

KPMG determined several megatrends:

- Demographics

According to KPMG this megatrend regards higher life expectancies and falling birth-rates. This causes an increase of elderly people in the world, challenges in social welfare systems.[20]

- Rise of the individual

Global education, health and technology have all advanced, which helped to empower individuals more than ever. This leads to increased demands for transparency from

[14] See IUESS (2012), p. 11.
[15] See IUESS (2012), p. 11.
[16] See IUESS (2012), p. 12.
[17] See IUESS (2012), p. 15.
[18] See IUESS (2012), p. 18.
[19] See Chism. (2014), p. 5.
[20] See Chism. (2014), p. 14.

governments and public decision making. By 2022 more people will be in middle class than poor.[21]

- Enabling technology

Technological advancement has changed the way we live and has transformed society over the last 30 years. This advance in technology is now creating novel opportunities, while testing government's ability to harness their benefits and showing prudent oversight.[22]

- Economic interconnectedness

International trade and capital flows will see an increase in the interconnected global economy. Progress and economic benefits will not be realized unless international conventions can be strengthened.[23]

- Public debt

This trend regards the public debt in 2030. The public debt will put a significant constraint on fiscal and policy options. If government's have the need to affect their capacity to respond to major social economic and environmental challenges they need to bring their debt under control and find new ways of delivering public services.[24]

- Economic power shift

developing countries are bringing millions out of poverty while also exerting more influence in the global economy. With a rebalancing of global power international institutions and national governments need to focus on keeping their transparency and inclusiveness.[25]

- Climate change

Climate change is becoming a serious issue caused by rising greenhouse gas emissions and inflicting unpredictable changes to the environment. The right combination of adaptation and mitigation policies will be challenging.[26]

- Resource stress

Population growth, economic growth and climate change are all stressing on essential natural resources. Sustainable resource management will be placed at the centre of government agendas.[27]

- Urbanization

By 2030, 33 per cent of the world population will live in cities rather than rural areas. This trend will create great opportunities for social and economic development and more

[21] See Chism. (2014), p. 18.
[22] See Chism. (2014), p. 22.
[23] See Chism. (2014), p. 26.
[24] See Chism. (2014), p. 30.
[25] See Chism. (2014), p. 34.
[26] See Chism. (2014), p. 38.
[27] See Chism. (2014), p. 42.

sustainable living, however it will also pressure on infrastructure and resources, especially energy.[28]

EY stated the definition for megatrends as large, transformative global forces that impact everyone on the planet. EY has identified six megatrends that define the future by having impact on business, society, culture, economics and individuals.[29]

1. Digital Future
   Technology is cloud technology, IoT, big data, technology are disrupting areas in business enterprises, changing the way people live and work.[30]
2. Entrepreneurship rising
   Entrepreneurships are rising all across the world. Rapid growth in emerging markets is a driver for more entrepreneurs. The face of entrepreneurships is increasingly young. More females are starting entrepreneurships.[31]
3. Global marketplace
   Faster growth rates and more favourable demographics in rapid growth markets will continue to be the centre of attention for the coming decade. Economic power will shift more to the east. Growing middle class and war for talent are also trends within the global marketplace.[32]
4. Urban world
   The number and scale of cities continues to grow. People from are massively migrating to the cities leaving rural areas.[33]
5. Resourceful planet
   Population growth, rising incomes, economic development will increase the demand in natural resources. [34]
6. Health reimagined
   Healthcare already accounts for 10 per cent of the world's GDP, but health systems are under cost pressure due to changing demographics, disease epidemics and rising incomes.[35]

Siemens has additionally identified their own megatrends. According to Siemens the steadily growing demand for energy, increasing water consumption, and the demand for high quality and affordable healthcare are issues that need focus and apparently occur mostly in cities. The following megatrends are defined by Siemens[36]:

1. Sustainable cities to aim a reasonable urbanization

[28] See Chism. (2014), p. 46.
[29] See Schreiber. (2015), p. 2-49.
[30] See Schreiber. (2015), p. 7.
[31] See Schreiber. (2015), p. 15.
[32] See Schreiber. (2015), p. 23.
[33] See Schreiber. (2015), p. 31.
[34] See Schreiber. (2015), p. 39.
[35] See Schreiber. (2015), p. 45.
[36] See Siemens. (2017)

2. Energy efficiency to preserve natural resources
3. Affordable and personalized healthcare to face demographic change
4. Globalization and industrial productivity

According to the Zukunftinstitut megatrends do not have to be "predicted", because they are already there and show changes which have shaped us for a long time and will continue to shape our lives. A megatrend works in every single person and covers all levels of society: economy and politics, as well as science, technology and culture. Megatrends are changing the world slowly, but in a fundamental and long-term manner.[37]

Kunze in his article: 'Replicators, Ground Drones and Crowd Logistics a Vision of Urban Logistics in the Year 2030' took several consulters and institutions whom state different global trends in different words. But putting these trends together he shows a pattern of global trends. Table 1 shows the results of all the trends indicated by these several firms. The table shows that the indicated trends by the firms all show some sort of relevance.[38]

Figure 2: Global Trend Table

Global Trend	Siemens AG	PwC	Ernst & Young	McKinsey & Company	Zukunftsinstitut
I. Digitalization & Technology Change	Digitalization	Technological Breakthrough	Digital Future	Accelerating Technological Change	Connectivity
II. Demographic Change	Demographic Change	Demographic Change	Health Reimagined	Responding to the Challenges of an Aging World	Silver Society, Health, Gender Shift
III. Climate Change	Climate Change	Climate Change & Resource Scarcity	Resourceful Planet	-	Neo-Ecology
IV. Urbanization	Urbanization	Urbanization	Urban World	Age of Urbanization	Urbanization; Mobility; New Work
V. Globalization	Globalization	Shift in Economic Power	Global Marketplace	Greater Global Connections	Globalization
Other Trends	-	-	Entrepreneurship Rising		**VI. Individualization**; Culture of Knowledge; Security
Source:	(Siemens 2015)	(PwC 2015)	(Ernst & Young 2015)	(McKinsey 2015)	(Zukunftsinstitut 2015)

Figure 2: Replicators, Ground Drones and Crowd Logistics a Vision of Urban Logistics in the Year 2030

In a white paper done by Procure It Right (PIR) six trends have been indicated on a more consumer-based level. PIR studied research and reports on procurement trends and merged their findings to show that happens within procurement within the coming years. These changes they have indicated are:[39]

1. Transparency: Market prices and cost out in the open focus can shift from price negotiations to joint innovation and collaborative value creation, generating competitive advantages for both parties.

[37] See ZukunftInstitut. (2016)
[38] See Kunze. (2016), p. 286-299
[39] See Procure it Right. (2015), p. 2-3.

2. Automation: Sourcing will be a completely decentralized process and executed by the person with the actual need. The role of the purchasing function will rather be to ensure all enablers are put in place to make this happen.

3. Connectivity: Thanks to the developing technology decision making will be based on comprehensive business intelligence and real-time figures.

4. CSR: This is still and will be an issue that pressures companies to secure a sustainable business practice.

5: Outsourcing: Shares of the middle and back-office functions will be outsourced. Opening new possibilities for procurement in helping the business with additional value.

6: Workforce transformation: Procurement will likely be more talent rich in 2020 and skills like sales, strategy, innovation and deep category knowledge rather than knowledge of sourcing processes will be required.

In a GEP whitepaper, Procurement in 2025: Five megatrends & their implications, Michael Kushner indicates five trends that affect procurement. The first one is the shift from external procurement focus to supply and operations management Focus. The second megatrend, the proliferation of incremental savings realization. Third trend is outsourcing becomes acceptable, delivers incremental value. Next trend is vendor management office leads as best practice. Lastly the final trend is procurement becoming central, shared service.[40]

"By understanding what the next decade may bring to the procurement function, procurement leaders will be better positioned to step out of the shadows and deliver a new level of operations management, along with new value to the businesses they support."[41]

Chartered Institute of Procurement & Supply (CIPS) indicated three megatrends concerning supply chain.

- The first one is increased complexity. Forecasting and planning has become more difficult as companies struggle to predict pricing and availability of raw materials.
- The next one is sustainable supply chains, companies are trying to stay as sustainable as they can be without increasing cost or reducing efficiency.
- The third megatrend is globalised risks, which can be adverse weather, transport network disruption and natural disasters.[42]

Comparing these megatrends with the megatrends from 2011 by h&z Consulting there is a relevance in megatrends. This shows that the megatrends in the research of 2011 are still in order and or still an issue.

[40] See Kushner. (2017), p. 2-10.
[41] Kushner. (2017), p. 10.
[42] See Ruth. (2015)

2.4: Strategic relevance of megatrends for firms

2.4.1: Strategic management: gaining competitive advantage by reacting on megatrends

This chapter will determine if firms gain competitive advantage when they react on the megatrends. There is a strong relationship between business models and gaining competitive advantage. A combination of deliberate alignment of resources and capabilities to strike competitive advantage is an effective business model.[43] Two important business models in the field of strategic management will be analysed, respectively the resource-based view and the market-based view.

The market-based view explains the performance of a firm through the external industry structure and the strategic conduct of competitors within the industry.[44] According to the market-based view, the sources of value for the firm are implanted in the competitive situation describing its external product markets. Three source of market power are frequently highlighted, these are: monopoly, barriers to entry, and bargaining power. A firms' performance is expected to be higher when it as a market environment characterized by the presence of monopoly or a strong market position.[45] According to Bea and Haas the "outside-in" perspective, the performance of a firm can be largely attributed to the structure of its industry.

The resource based view in contrast focuses on internal firm specific and capabilities to explain firm performance.[46] According to Wernerfelt, resources are those tangible and intangible assets tied semi-permanently to the organization.[47] This will include all firm specific assets, capabilities, organizational processes, firm attributes, information, and knowledge that allow the firm to develop strategies.[48] A basic assumption of the resource based view is that resources are heterogeneous and endowed with different levels of efficiency.[49] Resource based view can be identified in three criteria: imperfect imitability, imperfect substitutability and imperfect mobility.[50]

Competitive advantage can be gained by a firm when it is implementing a value creating strategy which is not at the same time implemented by a competitor and which is not imitable by any other organisation.[51] According to Porter firms gain competitive advantages when implementing strategies that use the internal strength, through responding to environmental opportunities, while neutralizing external threats and avoiding weaknesses.[52] To conclude if firms gain competitive advantages by reacting to megatrends. It is for a firm essential to prepare for megatrends and react to them in a way to gain advantages from their competitors.

[43] See Ranjith. (2016), p. 203.
[44] See Knecht. (2014), p. 14.
[45] See Makhija. (2003), p. 437.
[46] See Knecht. (2014), p. 14.
[47] See Makhija. (2003), p. 439.
[48] See Makhija. (2003), p. 439.
[49] See Cousins. (2008), p. 34.
[50] See Cousins. (2008), p. 34.
[51] See Barney. (1991), p. 102.
[52] See Porter. (1985).

3. The global five megatrends for procurement

3.1 The updated megatrend study: Challenges in procurement 2021

In May 2011, the German business consulting group h&z conducted a research on the challenges in procurement for 2021. The universal goal of h&z for this research was to discover trends which would influence the procurement of firms. This research of h&z was used as a base in the master thesis of K.J. Moller in 2011. It has now been seven years since this study was conducted, thus it is time for an update. In this thesis the five megatrends which were defined by h&z are compared with recent studies and trends. Studies from several respected firms have shown that the five megatrends of 2011 are still holding up today. These are the five megatrends:

1. CSR: increase of environmental and social responsibility
Corporate Social Responsibility is today still an issue that comes up a lot.

2. Acceleration of innovation
Technology has only received more and more appraisal. It is an extremely important trend that is seen in a lot of branches as a megatrend.

3. Demographic change
Higher educated and cheaper labour is becoming more available with the demographic changes.

4. Political and macro-environment changes
Political problems occur more and more and access to raw materials becomes more critical as the list of critical raw materials is expanding.

5. Shift of economic growth centres
'Demand in traditional industries (and mature markets) will slow down, but developing markets will experience strong growth'

3.2 The five megatrends for procurement from recent studies

3.2.1 Megatrend 1 - CSR: increase of environmental and social responsibility

3.2.1.1 Illustration of megatrend 1: Consumers demanding more sustainable behaviour from companies and resource scarcity being an issue.

The definition of Corporate Social Responsibility (CSR) is not always clear having so many conflicting goals and objectives. McWilliams defines CSF as actions that appear to further some social good, beyond the interests of the firm and what is required by law. Thus, according to her CSR means going beyond obeying the law.[53] CSR is something every board in a firm has to address in some form. Ironically, it is arguably the triumph of free-market ideology over regulated economies which has foisted new responsibilities on increasingly powerful multinationals companies[54] Corporations are more blamed today for making profits at the expense of sustainable development.[55] This results in companies actively contribute to sustainable development[56]. This shows that more companies today are practicing corporate social responsibility and disclose information on their activities[57] [58]. Furthermore, company's behaviour is influenced by consumers[59][60]. Companies today are more and more required to rethink their roles and responsibilities, in a relation not only to their shareholders also the needs and expectations of all their stakeholders, including employees, customers and community. The World Business Council for Sustainable Development has defined CSR as a continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families, the local community, and society at large.[61]

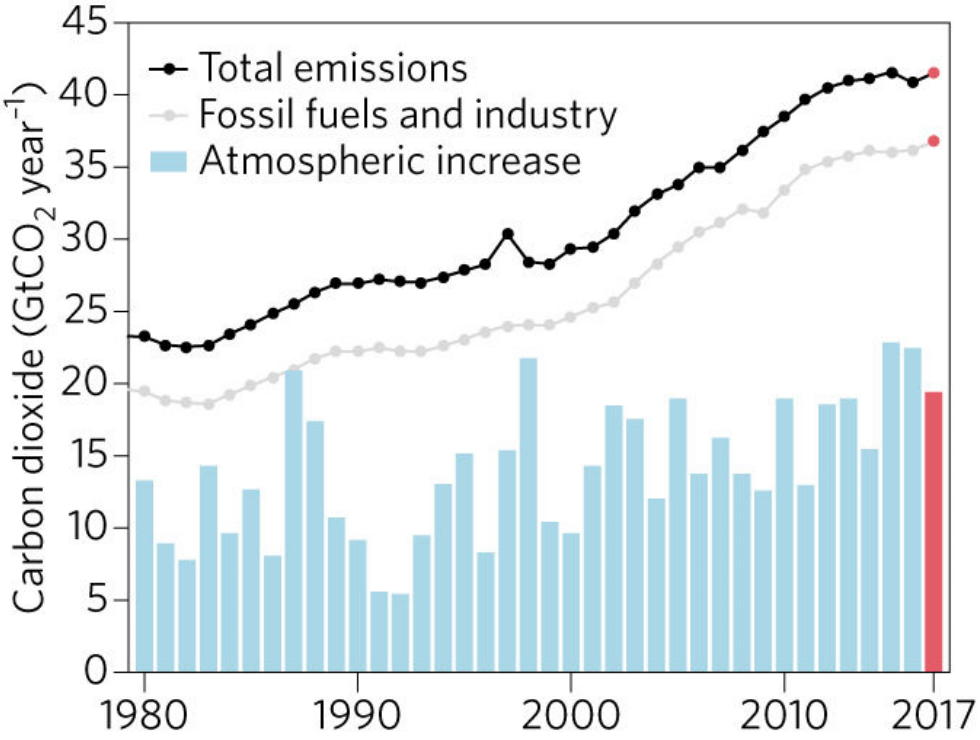
Han-min Wang, D. et al. examined the relationship among CSR, brand equity and firm performance. Their research suggest that corporate social responsibility and brand equity positively affect firm performance. The findings implied that high-tech firms should continuously engage in CSR and brand management to maximize their value.[62] CSR activities have been adopted based on growing evidence that consumers are willing to give incentives to socially responsible corporations.[63]

Carbon emission is still an important issue in several countries. The planet's carbon emissions are likely to surge by two per cent in 2017, due to the increased coal consumption in China. This unexpected surge would end the three-year period in which emissions have remained flat despite a growing global economy. However, the CO2 of United States and the European Union has continued to decline by 0,4 per cent and 0,2 per cent in 2017.[64] Even though the United States and the European Union showed a decline in emission, the world's emission has

[53] See McWilliams. (2001), p. 117.
[54] See Knox. Et al. (2005), p. 7.
[55] See Berschorner Et al. (2007), p. 11-20.
[56] See Martinez-Ferrero. Et al. (2015), p. 89-114.
[57] See Escrig. Et al. (2014), p. 559-574.
[58] See Gamerschlag. Et al. (2011), 233-262
[59] See Haase. (2008), p. 129-152.
[60] See Kotler. (2011), p. 132-135.
[61] See Zu. (2009), p. 7.
[62] See Wang. Et al. (2015), p. 2236.
[63] See Yoon. Et al. (2006), p. 378
[64] See Tollefson. (2017)

still continued to grow in 2017. Figure 3 shows a trend in CO2 emissions and atmospheric CO2 concentrations.[65]

Figure 3: Emission increase from 1980 till 2017



Source: http://www.nature.com/articles/s41558-017-0013-9)

The largest suppliers of carbon emissions have vowed to fight climate change. China aims to cap coal consumption at 4.1 billion tons by 2020 and use cleaner fuel.[66] The vice minister, Xin Guobin of China has also stated that research on banning gas powered vehicles is underway.[67] Mexico has pledged to reduce its greenhouse gas emissions by 22 per cent below baseline in 2030.[68] Canada and the United Kingdom have together enticed 18 other countries follow them in their goal for reducing CO2.[69] A micro-movement within this megatrend is the decreasing availability of fossil fuel and raw materials and the consequent chances of renewable energy.

3.2.1.2 Critical reflection of megatrend 1: The importance of CSR, the global increase of investments in renewable energies and potential risks in emerging economies.

Corporate Social Responsibility (CSR) is a perspective that is becoming increasingly important as stakeholders have communicates that modern business are expected to do more than make money and obey the law. Firms that are socially responsible make efforts to

[65] See Peters. Et al. (2017)
[66] See Xinhua. (2017)
[67] See Merchant. (2017)
[68] See Climate action tracker. (2017)
[69] See Wyld. (2017)

integrate a concern for other stakeholders in their policies, decisions and operations regarding CSR.[70]

In a research on "Consumer awareness and sustainability-focused value orientation as motivating factors of responsible consumer behaviour" Buerke et. al. suggest that responsible consumption should comprise a societal as well as an individual dimension. The results indicate that consumer awareness and sustainability focused value orientation have a direct positive influence on responsible consumer behaviour. Communication is becoming key to motivate their consumers to engage in more responsible consumption. [71]

The European Union has always been at the head of technological development and investment in renewable energy. The accelerating climate change has demanded from the European Union to set targets, including the most recent target to secure 27 per cent of energy from renewable sources by 2030.[72]

Corporate social responsibility investments are also increasing. According to a research where nearly 20,000 observations were made across 17 years evidence shows that talented managers view CSR as a favourably trend.[73] In the 19th annual global CEO survey 1,409 CEOs were interviewed 64 per cent say that corporate social responsibility is core to their business rather than being a stand-alone programme.[74] The global increase of renewable energy is seen in many countries. New investments in renewable energy was 285,9 billion dollars.[75] Whilst the UK is not short of home-grown projects, energy companies today can also look to strengthen their portfolios oversees. Investment into emerging markets need not be seen to have a negative impact on the UK renewable energy industry. Working with developer partners in different emerging markets can present strong growth opportunities in developments such as solar and onshore wind.
A recent World Bank report found that sub-Saharan Africa has the potential to generate more than 170 gigawatts of additional power-generation capacity through biofuel production, CHP and energy efficiency. Additionally, the Renewables 2016 report by the Renewable Energy Policy Network for the 21st Century highlighted that investment in renewable energy was higher in the world's poorest countries than the richest ones for the first time ever last year, which shows that this trend is not restricted to the rich few[76].

Two other good examples are China and India, the former of which wants to increase its 120 GW of wind capacity by 20 GW in 2016, as well as develop 350 GW of hydro power by 2020. India recently attracted an impressive $14 billion in renewable energy investment in 3 years which was mainly driven by investment in wind power. It's clear that renewable energy

[70] See Caroll. (2015), p. 87.
[71] See Buerke. Et al. (2016), p. 959-991.
[72] See Curran et al. (2017), p. 670.
[73] See Chatjuthamard. (2016), p. 265.
[74] See Nally. (2016), p. 16.
[75] See REN21. (2016), p. 99.
[76] See REN21. (2016)

is something that is catching the eye of investors all over the world, to the benefit of global economies, carbon emissions levels and the environment as a whole.[77]

3.2.2 Megatrend 2 - Acceleration of innovation

3.2.2.1 Illustration of megatrend 2: Technological advancements, growing investments in education, increasing numbers of innovations in high-growth markets and block chain technology.

The importance of ideas and creativity in value creation processes is dramatically increasing and they are at the heart of business. Investments in human capital, machinery and infrastructure are all very important ingredients, but it is the ideas of where and how to use them that are key to the development and growth of businesses.[78]

Technology refers to the tools and machines that are used to solve real-world problems. Innovation is a new idea, a more effective device or process. Knowledge is the familiarity with or understanding of something such as facts, information or skills.[79]

Investments in developing countries have been made the last years to catch-up with the developed countries. Figure 4 and 5 supports this fact. In figure 4 the development of expenditure in education is shown.[80] Recent studies have shown that these numbers have indeed increased since then. Figure 5 shows the recent changes in expenditure of education.

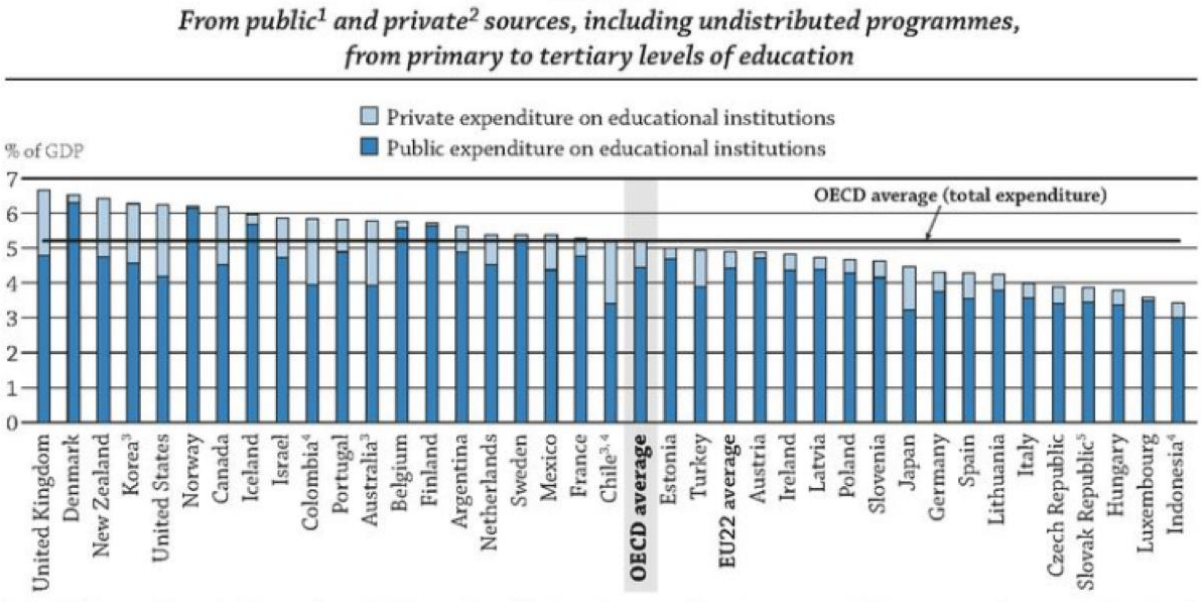
Figure 4: Expenditure on educational institutions as percentage of GDP

	2000	2008	Change (%)
USA	6.9	7.2	0.3
Japan	5.0	4.9	-0.1
Germany	4.9	4.8	-0.1
Brazil	3.5	5.3	1.8
Russia	2.9	4.7	1.8
OECD-countries	-	5.9	-
EU 21-countries	-	5.5	-

Source: Based on OECD (2011a), p. 229.

[77] See Pickard. (2016), p. 230.
[78] See Anderson. Et al. (2016), p. 153.
[79] See Anderson. Et al. (2016), p. 154.
[80] See OECD. (2016)

Figure 5: Recent changes in expenditure on Educational institutions



Source: Based on OECD (2017), p. 180.

Not only education is receiving more attention but the changes in patent applications have also been significantly higher than five years ago. Figure 6 shows the application of patents back in 2011.

Figure 6: Patent application from 1995 to 2010

	1995	2000	2005	2010	Change 1995-2010 (%)
World	1,047,766	1,377,466	1,701,331	1,979,133	88.9
USA	228,142	295,895	390,733	490,226	114.9
Japan	368,831	419,543	427,078	344,598	-7.0
European Patent Office	60,559	100,692	128,713	150,961	149.3
Germany	46,158	62,142	60,222	59,245	28.4
Brazil	7,448	17,376	20,005	22,686	204.6
Russia	24,444	32,337	32,253	42,500	73.9
India	6,566	8,538	24,382	34,287*	422.2
China	18,699	51,905	173,327	391,177	1992.0

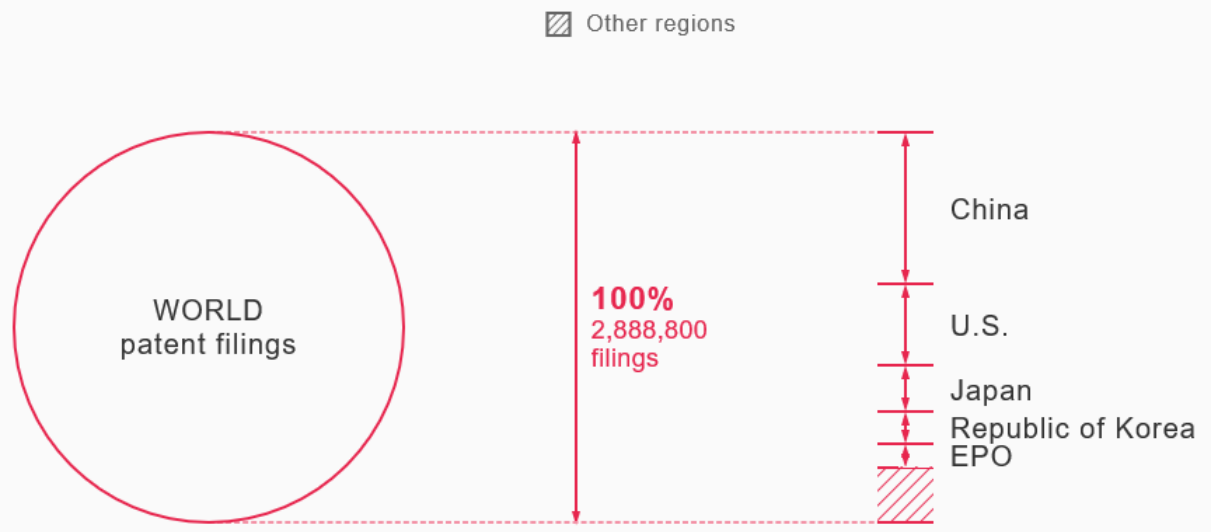
* Data from 2009

Source: Based on World Intellectual Property Organisation (2011).

Recent numbers have shown a strong growth in demand for intellectual property rights. In total, there were 2,888,800 fillings for patent application in the world in 2015. Figure 7 shows these numbers. China has made a total of 38.1per cent of the total applications for patents. The United States stands at 20.4 per cent, Japan at 11 per cent and Korea at 7.4 per cent.[81]

[81] See World Intellectual Property Organization. (2017)

Figure 7: World patent filling

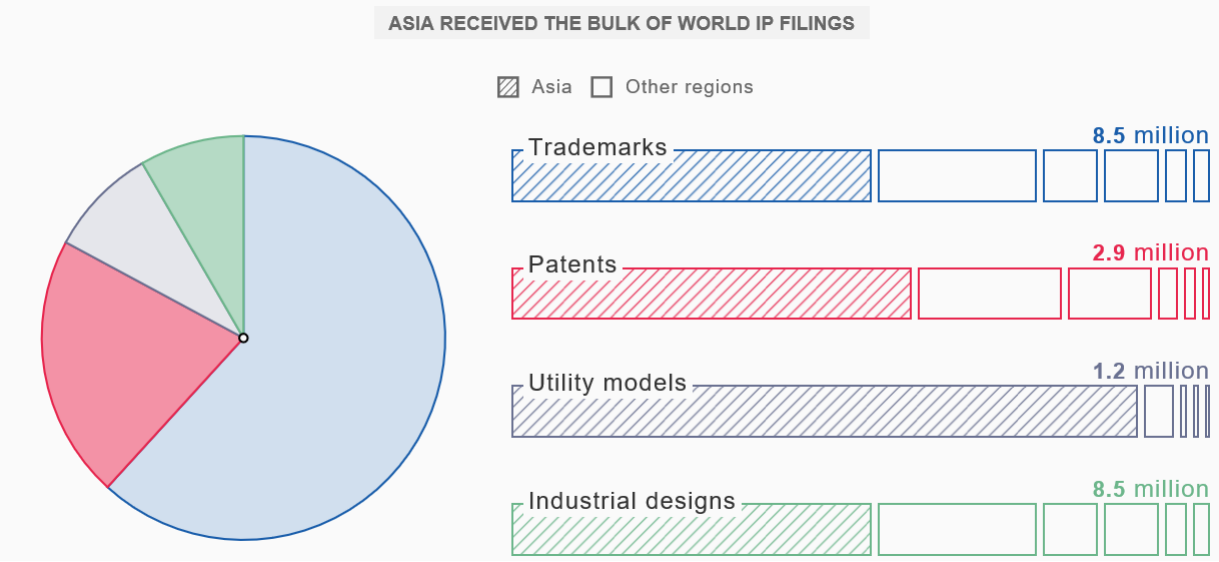


Source: Based on World Intellectual Property Organisation (2017).

Especially China has made the most significant growth in patent application and has caught-up on every other country since then.

The method for developing countries to catch-up with the developed countries is leapfrogging. Leapfrogging can be seen as jumping over and skipping several steps in the development process of technologies.[82] Asia has received the most application in 2015, they have used the method of leapfrogging to skip several steps in the development. Figure 8 shows these numbers for Asia.

Figure 8: Total amount of patent fillings in Asia



Source: Based on World Intellectual Property Organisation (2017).

[82] Gallagher (2006), p. 384

Industry 4.0: mass production is changing to customized production. Advancement in technology is changing the way we produce. The term industry 4.0 stands for the fourth industrial revolution see figure 9. This new way of working contains the following applications: Internet-of-Things, industrial internet, smart manufacturing and cloud-based manufacturing.[83] To have industry 4.0 work, regular machines have to be converted to self-aware and self-learning machines to improve their overall performance and maintenance management with the surrounding interaction. The aim of industry 4.0 is to construct an open, smart manufacturing platform for industrial-networked information application.[84] In figure 10 data from Statista shows that in 2016 the size of the smart factory market in 2016 was 46.2 billion dollars and this is projected to go to 56.6 billion dollars in 2020.

Figure 9: the industrial revolutions

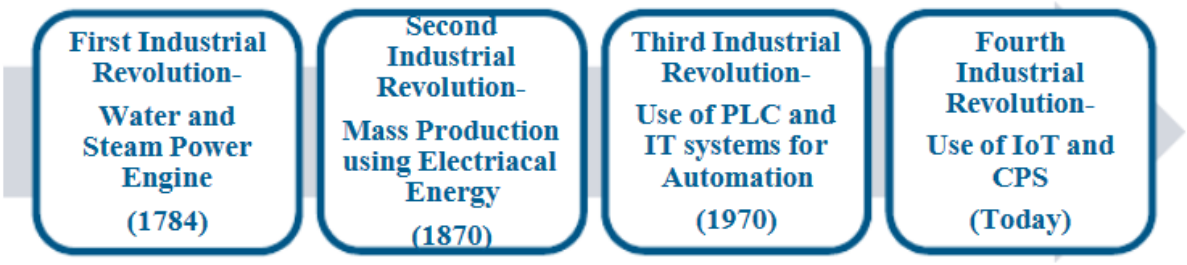
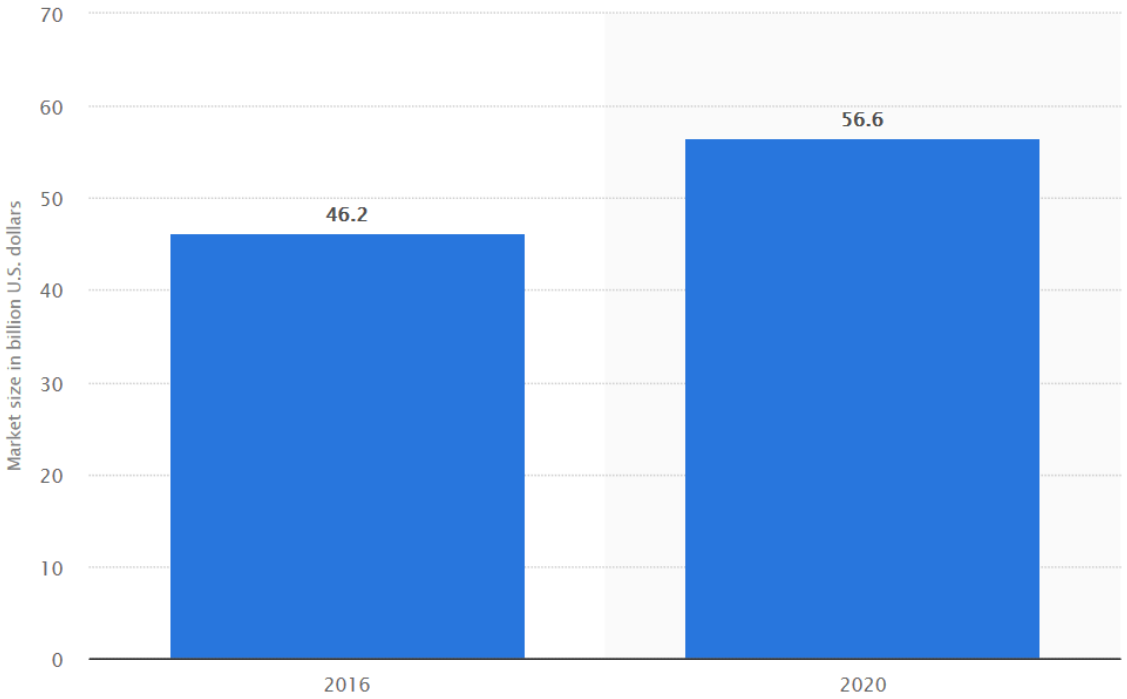


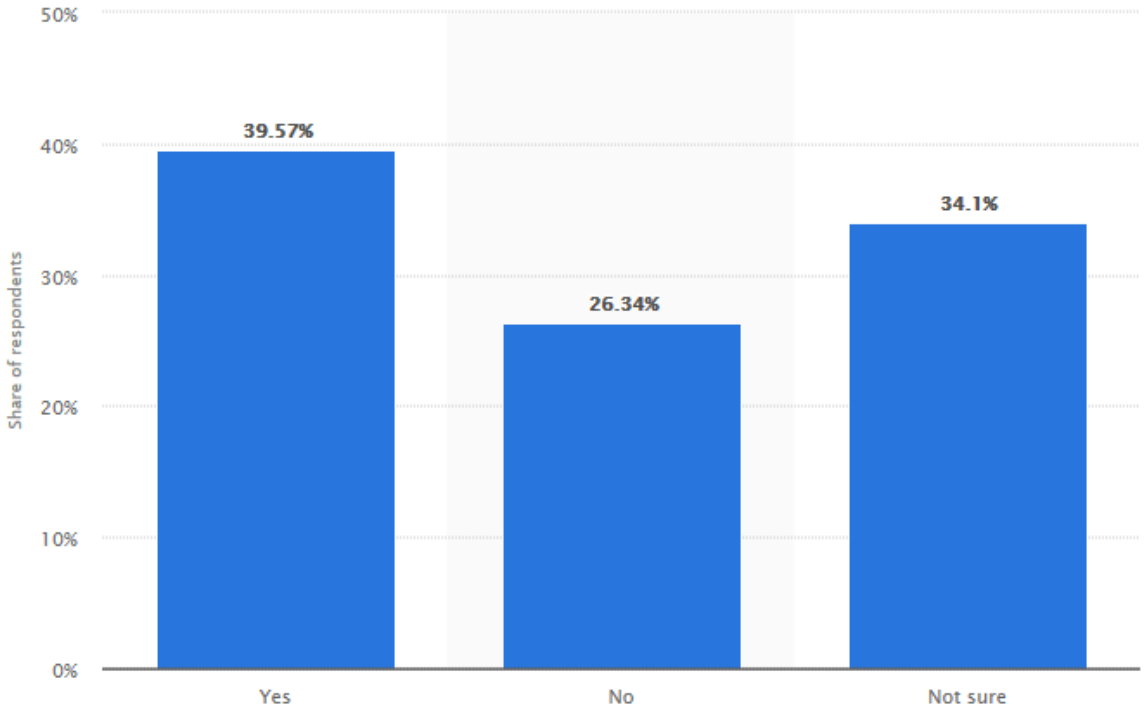
Figure 10: Global size of the smart factory market in 2016 and 2020 (in billion U.S. dollars)



[83] See Vaidya. Et al. (2018), p. 233
[84] See Vaidya. Et al. (2018), p. 233

Blockchain technology is increasing in popularity because of bitcoin. Bitcoin is the digital currency called the cryptocurrency' that has gained widespread attention. In simple terms blockchain handles blocks (uniquely identified), linked transactions records in a chain. Blockchains are continuously growing.[85] According to Statista 39.57 percent of the people in United States are willing to use Bitcoin for transactions and purchases in 2017. Figure 11 shows these results from a survey in the United States.

Figure 11: Willingness of people in the United States to use Bitcoin for transactions or purchases.



Among many activities that are likely to be transformed by blockchain, supply chain thus deserves special attention. An increasing reliance on the use of Internet-of-things (IoT) applications is among the trends that will affect supply chain management (SCM). With IoT, radio-frequency identification (RFID) tags, sensors, barcodes, GPS tags and chips, the locations of products, packages and shipping containers can be tracked at each step. This allows an enhanced, real-time tracking of goods from their origins.

Supply chain will be transformed because of blockchain technology. An increasing reliance on the use of Internet –of-Things applications is one of the trends that will affect supply chain management. Using radio-frequency identification tags, sensors, barcodes, gps tags and chips the locations of products can be tracked every step of the way. Blockchain has many advantages for supply chain, Kshteri has summarized the roles of blockchain for supply chain

[85] See Treleaven. Et al. (2017), p. 15

management. This shows benefits for companies and can be in line with industry 4.0 These roles are shown in figure 12.[86]

Figure 12: Supply chain and blockchain roles.

Supply chain performance dimension	Blockchain's roles
Cost	Economic sense to generate a blockchain code even for small transactions.
	Crisis involving defective products (e.g., contaminated food): easily identify the source and engage in strategic Removals of affected products instead of recalling the entire product line Allocate just the right amount of resources to perform shipping and other activities Elimination of paper records
	Regulatory compliance costs can be reduced. Supply chain partners are not able to use low quality and counterfeit ingredients Can provide data that can be used to assess useful, meaningful and representative indicators for describing quality.
Speed	Speed can be increased by digitizing physical process and reducing interactions and communications.
Dependability	Supply chain partners can expect a high level of dependability of measurement for various indicators such as quality and weights Exerting pressure on supply chain partners to be more responsible and accountable for their actions.
	Blockchain-based digital certification as a means of increasing dependability. Blockchain's "super audit trail" can address challenges associated with self-reported data that are provided by supply chain partners.
Risk reduction	Addressing the holistic sources of risk
	Only parties mutually accepted in the network can engage in transactions in specific touchpoints. Can ensure that software file downloaded has not been breached.
Sustainability	Verifying sustainability: possible to make indicators related to sustainability more quantifiable and more meaningful.
Flexibility	Levels of network effects: Even if only a few participants use a blockchain solution, this will have a powerful effect. The power of this solution increases with the network effect. Higher level of impact with deeper IoT integration in logistics and supply chain Can address consumers' concern about the source of their food and beverages by providing indicators related to sustainability more quantifiable and more meaningful.

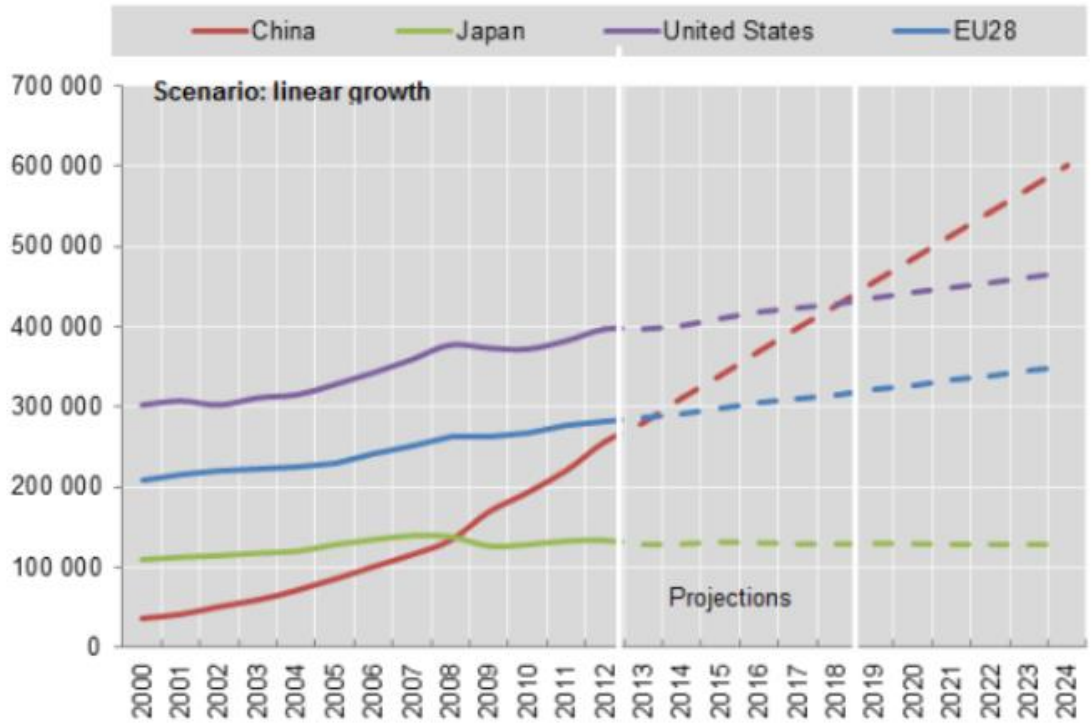
[86] See Kshteri. (2017), p. 69

3.2.2.2 Critical reflection of megatrend 2: Limited potential of technological advancement and the war for patents. China gaining in on the United States.

China is one of the countries that has shown strength in growth of technological advances. The number of applications done by China is a reflection of their goal of becoming an innovation led company by 2020. The leaders of Beijing have set their sights on becoming a world leader in science and technology in 2050. Unfortunately, there still lays the problem of the government intervening in partnerships of firms in China and outside. Even the most technologically advanced firms in China are still subservient to the government. This means when a foreign firm wishes to participate in China's innovation agenda they will need to do so in partnership with the government.[87]

In the last study by Moller about the megatrends, it was said that the main drivers of innovation where still the countries which are listed in the Organisation for Economic Co-operation and Development (OECD).[88] However in 2014 data had shown that China was heading to overtake the European Union and United States in science & technology.[89] Figure 13 shows these numbers.

Figure 13: China poised to outpace the US in R&D spending around 2019



Source: OECD Science, Technology and Industry Outlook 2014

[87] See Chan. (2015), p. 27
[88] See Möller. (2012), p. 32.
[89] See OECD. (2014).

3.2.3 Megatrend 3 - Demographic change

3.2.3.1 Illustration of megatrend 3: Population ageing, the decreasing human resource availability and the war for talents.

A key trend in demographic change that has been coined by the United Nations is ageing. The global population of people 60 years and over is numbered at 962 million people in 2017. This number is twice as large as the population of 60 years and over in 1980. It is predicted that the number of older people will increase to 2.1 billion in 2050.[90] Figure 14 shows the number of older people in 2017 and in 2050. The population ageing key driver is caused by the reductions in fertility and improvement in survival that have occurred.[91]

Figure 14: Number and distribution of persons aged 60 years or over by region, in 2017 and 2050

	Number of persons aged 60 years or older in 2017 (millions)	Number of persons aged 60 years or over in 2050 (millions)	Percentage change between 2017 and 2050	Distribution of older persons in 2017 (percentage)	Distribution of older persons in 2050 (percentage)
World	962.3	2080.5	116.2	100.0	100.0
Africa	68.7	225.8	228.5	7.1	10.9
Asia	549.2	1273.2	131.8	57.1	61.2
Europe	183.0	247.2	35.1	19.0	11.9
Northern America	78.4	122.8	56.7	8.1	5.9
Latin America and the Caribbean	76.0	198.2	160.7	7.9	9.5
Oceania	6.9	13.3	92.6	0.7	0.6

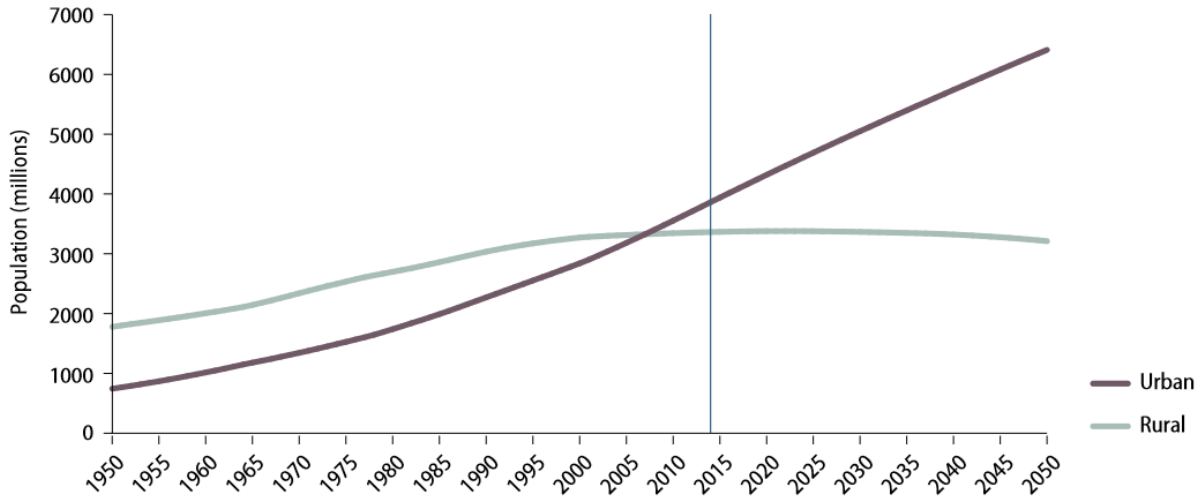
Source: United nations (2017)

Identifying and searching for talent has been in very much demand in our global and technological society. It is not a priority in undeveloped countries, the bottom half of the world. However even in developed countries not all kinds of talent talents are recognized. The major reason why the western society is upfront in development is that people gather new ideas from other cultures and tend to develop more. The western world however has peaked in this area and are now beginning to lose to China, India, South Korea, Japan, etc. Talented immigrants who came to western society are now looking for jobs in emerging countries.[92] The 'global war for talent' refers to the increasing competition between organizations to acquire the top employees.[93] A term that has frequently occurred is urbanization, which according to the Cambridge Dictionary is defined as a process where more and more people move from the countryside to the cities.[94] Globally more people live in urban areas than in rural places. In 2007, it was the first time in history, that the global urban population exceeded the rural population. In 1950 70 per cent of the world population lived in rural places while 30 per cent lived in the cities. In 2018 55 per cent of the world population lived in the cities. It is

[90] See United Nations. (2017), p. 1.
[91] See United Nations. (2017), p. 10.
[92] See Ornstein. (2015), p. 142.
[93] See Porschitz. (2015), p. 343.
[94] See Cambridge.

expected that the world population in urban areas will grow even more and by 2050 34 per cent of the world population will live in rural areas and 68 per cent will live in urban areas.[95] Figure 15 shows the population in the world moving to urban areas.

Figure 15**:** Urban and rural population of the world, 1950–2050

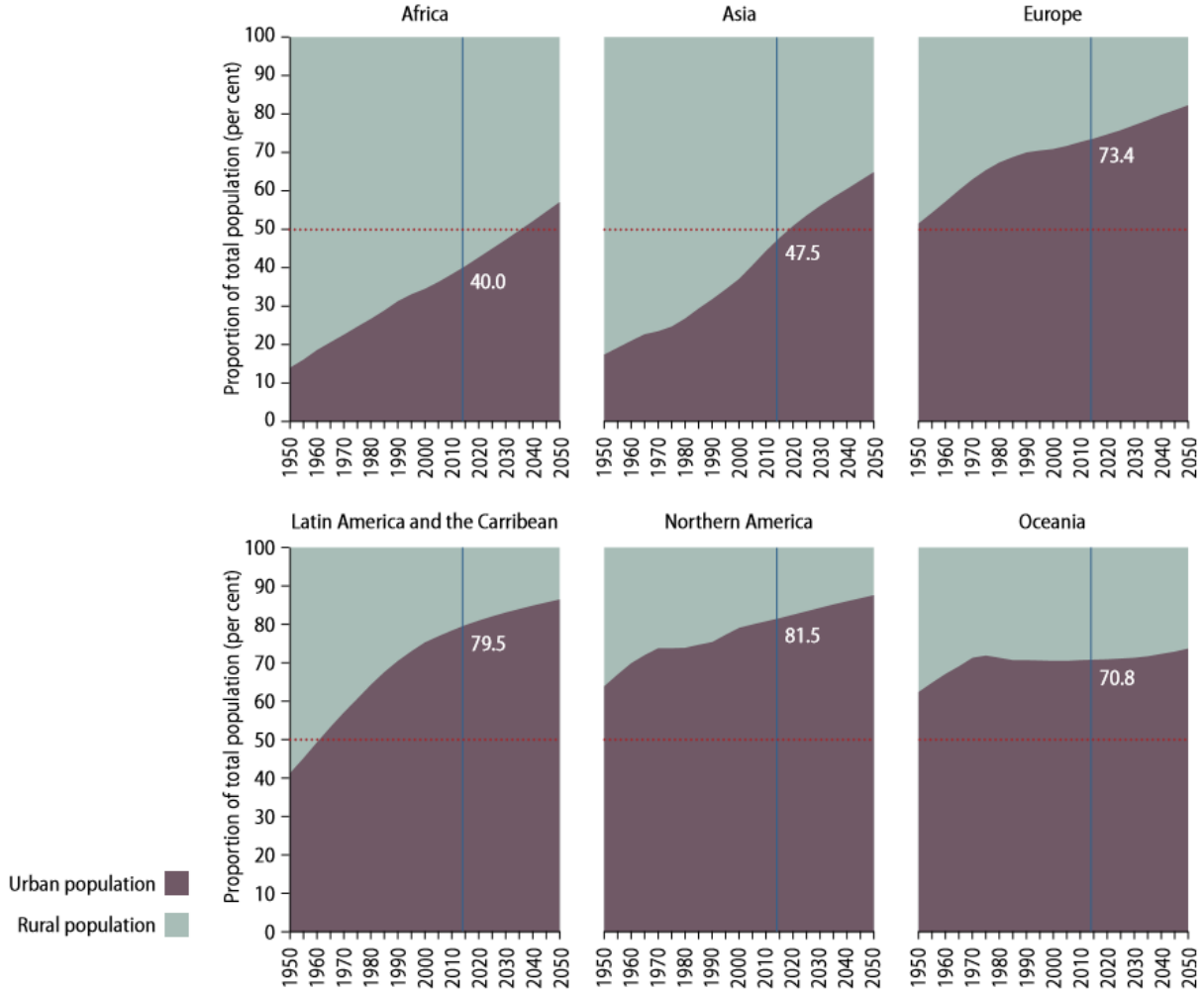


Source: **https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf**

These levels of urbanization vary greatly across different regions. Latin America, the Caribbean and Northern America have the highest level of urbanization whereas 80 per cent live in cities. In Europe, the population living in urban areas is 73 per cent, but it is expected to reach 80 per cent by 2050. Africa and Asia will grow the fastest the coming years, while today 40 per cent and 48 per cent live in urban areas over the decades it is expected to increase in all regions. Asia is projected to reach 56 per cent by 2050 and Africa is expected to reach 64 per cent and will still remain the least urbanized regions in the world.[96] In figure 16 the urban and rural population is shown from the different regions.

[95] See United Nations. (2018), pg. 2.
[96] See United Nations. (2014), pg, 8.

Figure 16: Urban and rural population from 1950 to 2050 by major areas.



Source: https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf

3.2.3.2 Critical reflection of megatrend 3: Consequences of population ageing in developed countries and global population growth will go beyond the year 2020

The growth in absolute number of older persons will occur in a low or declining fertility, thus leading to increasing shares of older persons in the population in most countries. 2017 on in eight people was over 60 years or over in the world. In 2050 this difference will be projected to one in five globally. The highest numbers in 2017 come from Europe and the United States where more than one in five persons was aged 60 or over in 2017. Figure 17 shows the number of persons above 60 in the top 10 countries with the largest share in these persons. Japan has already caught-up with every other country with a percentage of 33.4 per cent and this number will increase to 42 per cent in 2050.[97]

[97] See United Nations. (2017), p. 9.

Figure 17: Ten countries or areas with the largest share of persons aged 60 years or over, in 1980, 2017 and 2050

	1980		2017		2050	
Rank	Country or area	Percentage aged 60 years or over	Country or area	Percentage aged 60 years or over	Country or area	Percentage aged 60 years or over
1	Sweden	22.0	Japan	33.4	Japan	42.4
2	Norway	20.2	Italy	29.4	Spain	41.9
3	Channel Islands	20.1	Germany	28.0	Portugal	41.7
4	United Kingdom	20.0	Portugal	27.9	Greece	41.6
5	Denmark	19.5	Finland	27.8	Republic of Korea	41.6
6	Germany	19.3	Bulgaria	27.7	China, Taiwan Province of China	41.3
7	Austria	19.0	Croatia	26.8	China, Hong Kong SAR	40.6
8	Belgium	18.4	Greece	26.5	Italy	40.3
9	Switzerland	18.2	Slovenia	26.3	Singapore	40.1
10	Luxembourg	17.8	Latvia	26.2	Poland	39.5

Source: United nations.

Population ageing is driven by the reductions in fertility and improvements in survival that occur during the demographic transition. This demographic transition to lower fertility and higher survival rate first started in Europe by the late nineteenth or early twentieth centuries in almost all areas. This transition started later in Asia and in Latin America and the Caribbean. However, in Africa the transition has not seen a significant change in lower fertility and survival rate.[98] This trend of declining fertility and rising life expectancies is causing significant changes in the global business environment in terms of business opportunities, workforce, productivity, cross-cultural management, marketing, macroeconomic public policies and corporate strategies.[99] The war for talent will be the competition to attract highly skilled workers will intensify.[100]

As the world keeps urbanizing, sustainable development challenges will become increasingly concentrated in cities, especially in the lower-middle-income countries. In these countries, the pace of urbanization is the fastest. Urban dwellers have a better lifespan than people in rural areas, since there is better access to primary needs. Government will have to implement policies that will ensure that the benefits of urban growth are shared equitably and sustainably. Sustainable urbanization requires that cities generate better income, employment opportunities, expand the necessary infrastructure for water and sanitation, energy, transportation, information and communications. Governments need ensure equal access to services; reduce the number of people living in slums; and preserve the natural assets within the city and surrounding areas.

Diversified policies are needed to manage spatial distribution of the population and internal migration. History has shown that policies that are focused on limiting rural-urban migration, has been ineffective in preventing city growth and can even create economic, social and

[98] See United Nations. (2017), p. 9.
[99] See Chand. (2014), p. 409.
[100] See Chand. (2014), p. 422.

environmental damage. Governments have to use different strategies to restrict urban-rural migration for instance allocating land rights, managing land use, land distribution, creating regional development zones and promoting economic diversification and competitiveness in rural areas.

Policies aimed at a more balanced distribution of city growth, avoiding excessive focus on just one or two large cities within a single country, can also support sustainable development. To assess current and future needs in urban growth and setting policy priorities to promote inclusive and equitable urban and rural development it is critical to assess accurate, consistent and timely data on global trends. Governments that have international support, should continue their efforts in producing more extensive and better-quality data on the size, distribution and characteristics of the population. To attain urban sustainability, there is a need for building institutional capacities and applying integrated approaches. These sustainable urbanizations require competent, responsive and accountable governments equipped with the management of cities and urban expansion and the appropriate use of information technologies.[101]

[101] See United Nations. (2014), p. 17.

3.2.4 Megatrend 4 - Changes in the political and macroeconomic environment

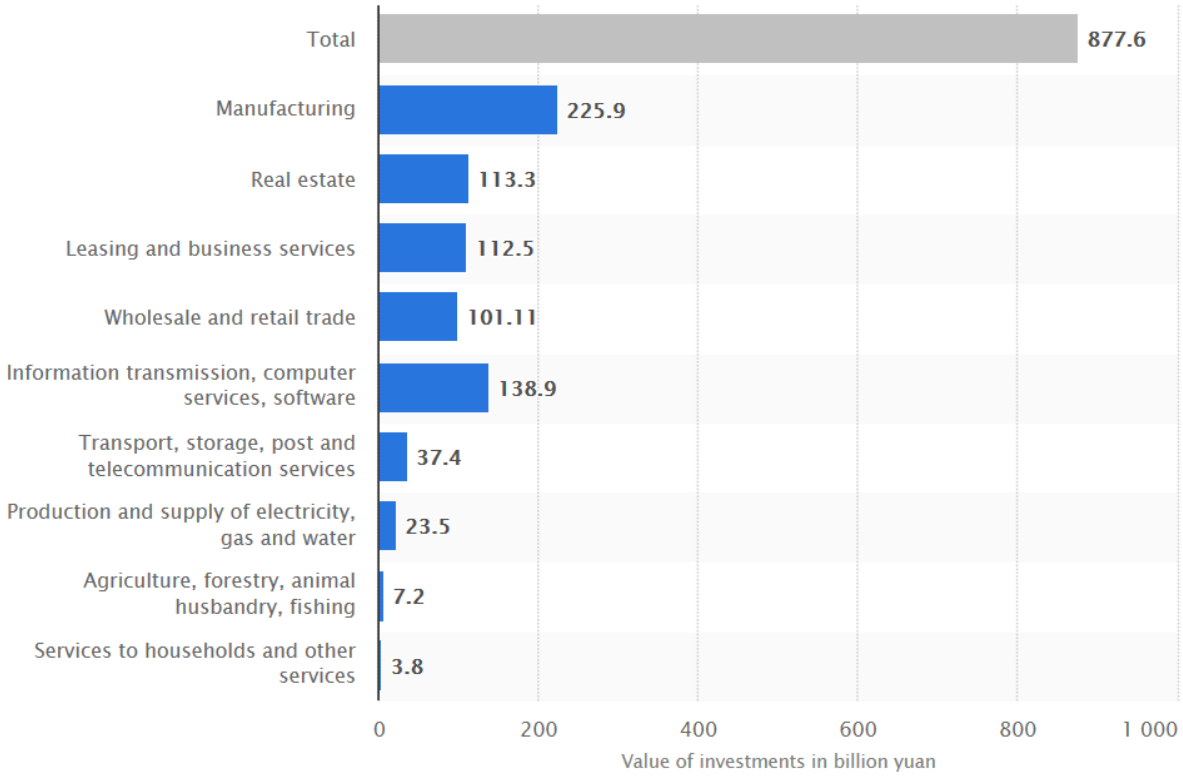
3.2.4.1 Illustration of megatrend 4: Increasing state-capitalism, raw material shortages and the rising number of financial investments in raw materials

From 2002 until 2008 the world economy grew and especially in emerging economies. Emerging markets like China and India were growing their need for raw materials. Emerging technologies such as information and communication-, renewable energy generation-, and energy storage-technologies are expected to increase the demand for geochemically scarce metals significantly in the near future.[102] The latest economic crisis underlined that industry is an important part of the European economy. The European Commission aims to raise the share of manufacturing back to 20 per cent of GDP by 2020 in order to strengthen the European economy.[103]

In 2011 the European commission had 14 raw materials on the list of critical raw materials. In 2017 the European Commission has added 13 more raw materials to the list of critical raw materials. These 27 materials are categorised as critical, since the consequences for the economy, in case of a supply bottleneck is becoming larger to other raw materials.[104] However China is no longer investing in raw materials as much as they used to. China's share of new contract on foreign direct investments in commodity assets fell to 30 per cent in 2014 and 80 per cent in 2005-2011. The preferred investments targets of China are transport, tourism, entertainment and high-tech sectors. from 2005 till 2014 the share of these four investments grew 17 per cent. From 2014 till 2015 the shares grew 46 per cent.[105] New data seen in figure 18 of 2017 from the Chinese government shows that manufacturing has the most interest for foreign direct investments.

[102] See Knoeri. (2013), p. 808.
[103] See Buchner. Et al. (2015), p, 253.
[104] See European Commission. (2017).
[105] See ACRA. (2016), p. 1.

Figure 18: Value of foreign direct investments in China in non-financial sectors in 2017, by sector (in billion yuan)



A key development in megatrends of the last research was state capitalism. State capitalism can be defined as a system in which the state dominates the markets primarily for political gain.[106] "State capitalists use markets to extend their own political and economic leverage- both within society and on the international stage."[107] In the previous research China was still the most important country in state capitalism.[108] In China the constitution clearly states that the government can in the interest of the public interest confiscate or use the private property of the citizens in accordance to the law.[109] In 2009 at the end of the year China owned US $ 2.4 trillion in foreign exchange reserves, with 20 per cent of them placed into two sovereign wealth funds. One of it being controlled by the government and an unofficial fund, started by China's State Administration of Foreign Exchange, the SAFE Investment Company (SIC).[110] This number has been growing since and as of September 2017 China's foreign exchange reserve has reached US $ 3.109 trillion.[111]

[106] See Bremmer (2010), p. 250.
[107] See Bremmer (2010), p. 250.
[108] See Möller. (2012), p, 36.
[109] See Hu. (2010), p, 11.
[110] See Thomas/Chen (2011), p. 467-468.
[111] See Trading Ecnomics. (2017).

3.2.4.2 Critical reflection of megatrend 4: Increase of material efficiency to counteract against the scarcity of raw materials

The scarcity of resources is becoming a great priority for the political agenda in well-developed material-intensive countries, as threat over the security of sustainable supply of resources continue to grow. Due to the advancement of technology the few different metals used in the past increased to almost the full range of the periodic table.[112] The problem is that some technologies are highly dependent on specific materials, of which many are not substitutable.[113] For example China even though they have decreased their investment in raw materials, they still they still account for 95 per cent of the global production. This implies that any policy change, instability, or other geopolitical factors can induce high supply disruption. Russia from the BRICS countries faces the highest geopolitical supply risk for most imported resources. Canada as part of G7 countries is facing the highest risk from import of rare earth elements imports. The United States and the EU-27 have the highest risk for beryllium.[114]

Gemechu et al. suggest the integration of a systematic tool that quantifies environmental burdens associated with the entire lifecycle of a product by linking emissions and resource uses to a number of midpoint impact categories and then to classes of endpoint categories, the so-called areas of protection (AOP). Under the LCSA (framework the integration of geopolitical information allows the LCA to broaden its scope, so that decision makers can use it in their quest to secure the sustainable resource supply. These will help leaders and policymakers to reduce supply risk by shifting import from countries with a high risk of conflict to conflict-free regions or through diversifying their supply chain. The other option is to encourage substitution of resources that are greatly available. This can be done by the development of scientific research.[115]

[112] See Gemechu. Et al. (2015), p. 154.
[113] See also Gemechu. Et al. (2015), p. 154.
[114] See Gemechu. Et al. (2015), p. 163.
[115] See also Gemechu. Et al. (2015), p. 163.

3.2.5 Megatrend 5 - Shift of economic growth centres

3.2.5.1 Illustration of megatrend 5: Economic power shift from developed to high-growth markets

An economic power shift from west to east is taking place and emerging markets are showing a strong growth. This will bring significant changes since the world is no longer dominated by a strong power block but rather by diversified power centres.[116] The four countries Brazil, Russia, India and China take up 42 per cent of the world population, these four countries together are also called the BRIC. The combined economy of the BRIC makes up 25.6 per cent of the world's GDP, this can grow to 33 per cent by 2020.[117] China and India have come up as the most powerful economies in the BRIC and among the fastest growing economies in the world. The two countries have an openness and the manufacturing and service sectors have had different levels of performance and as a result they have adopted different strategies in economies.[118]

Figure 19 shows the GDP per capita in US from 1980 to 2009. China and India showed the strongest growth compared with the other countries. To put it in perspective the same countries are seen in figure 15 showing numbers from 2009 to 2017.

Figure 19: the GDP per capita in US $ from 1980 to 2009

	1980	2009	Change (%)
USA	12,153	45,674	275.8
Japan	8,387	32,018	281.8
Germany	9,778	36,332	271.6
OECD-countries	8,531	33,023	287.1
Brazil	3,741	10,453	179.4
Russia	-	19,023	-
India	416	3,039	630.5
China	251	6,786	2603.5

Source: OECD (2011)

Figure 20: the GDP per capita in US $ from 2009 to 2017

	2009	2017	Change %
USA	46,909	59,495	26.8%
Japan	41,014	38,550	-6.4%
Germany	42,576	44,184	3.7%
Brazil	8,625	10,020	16.2%
Russia	9,178	10,248	11%
India	1,153	1,852	39.1%

[116] See PWC. (2017)
[117] See Siddiqui. (2017), p. 315.
[118] See Siddiqui. (2017), p. 335.

China	3,838	8,583	55.3%

Source: Knoema (2017) https://knoema.com/atlas

Figure 20 indicates that India and China are still growing the strongest in GDP per capita since 1980.

3.2.5.2 Critical reflection of megatrend 5: The dominance of Western companies in most important industries and the growth of China and India is highly export-dependent and unsustainable

The rise of Chinese power would not have been realized without a rapid, multi-decade growth of the Chinese economy. China stands out from the rest because of their record-high and record-long growth of 10 per cent a year for more than three decades now.[119] The United States will maintain a slight edge over China in the competition for hard power and Beijing will never catch up to Washington. However, if the United States fails to maintain and environment favourable to growth and innovation like in the past, and if China is as successful as Taiwan and South Korea in boosting productivity, Beijing will have a great chance in surpassing Washington in terms of hard power. [120]

According to PWC Asia will be representing 66 per cent of the global middle-class population and 59 per cent of middle-class consumption by 2030, an increase from 28 percent and 23 percent. This has potential for the automotive industry since in India there are about 18 cars per 1,000 people, and in China it is 60 cars per 1,000 people. Compared with the US they have 765 cars per 1,000 people.[121]

[119] See Vuving. (2012), p. 402.
[120] See Vuving. (2012), p. 420.
[121] See Modly. (2016), p. 4.

4. Research Methodology

4.1 Description of research method

This research is an update of the megatrends in 2011 by Klaus Moller. One main method used for determining if the megatrends defined in 2011 still hold up today is a literature review. The megatrends were initially determined by h&z business consultancy. The same data is used for this research together with an extensive literature to determine the megatrends. Each megatrend is illustrated and discussed in detail and after having done the qualitative methods the findings have been analysed with the use of a quantitative survey. The quantitative and qualitative data together should be sufficient to answer the research question.

4.2 Data collection

4.2.1 Questionnaire development

The survey consists of the five megatrends with each of the trends underlining with micro-trends. The participants were asked whether each of these trends influences their organisation. Next the participants were asked to what extend they are prepared for each of these megatrends. Lastly for the respondents were then asked to indicate their firms position compared to their competitors in terms of their market performance, which include market profit, market share, market innovativeness and market growth. Items to be measured will be developed based on the literature review. The measurement will be done on a Likert-type rating scale with five categories for response (1 = strongly disagree, 5 = strongly agree; in case of the performance indicators 1 = much worse, 5 = much better will be used).[122] The questionnaire will be distributed in the English and Dutch language.

4.2.2 Sampling procedure and characteristics of the respondents

The survey was directed to the professionals of the firm who are in charge of procurement or supply management. To have the results of the survey close to the research from 2011 approximately the same number of respondents were approached, which was around 300 people.[123] The respondents are mainly approached via the means of LinkedIn. To get the most responses for the survey each respondent is contacted individually and then asked to fill in questionnaire.

4.3 Hypothesis

The questions from the survey are determined via the hypothesis. For each megatrend hypothesis' have been determined. This will be part one of the survey. These hypotheses will be:

Megatrend 1. CSR: increase of environmental and social responsibility

1. Stronger consumer request concerning ethical and CSR activities
2. Governmental pressure on corporate social responsibility

[122] See Allen. (2007), p. 64
[123] See Moller. (2012)

3. Increasing environmental legislation forces firms to change their behaviour.
4. Trend for environmental products with consumers
5. Shift to renewable energy
6. Climate change

Megatrend 2. Acceleration of innovation

7. Automation and digitalisation
8. Industry 4.0, internet-of-things applications (cyber-physical systems, new autonomous production forms)
9. Machine-to-machine communication and artificial intelligence:
10. Speeding-up of technological development
11. Novel transportation decreasing transport costs (drones, autonomous driving etc.)
12. E-mobility
13. Entrepreneurship rising (start-up wave)
14. Innovations in network rather than in in-house laboratory (open innovation)
15. Mass customisation: consumers demanding more individualised products
16. Smart and sustainable cities

Megatrend 3. Demographic change

17. Population ageing becoming a more serious issue,
18. "War for talent" arising (lack of educated workforce)
19. Developing countries growing talent pool
20. Overpopulation in developing countries
21. Urbanisation (cities will gain on rural areas in population)
22. Challenges in health and social systems due to decreasing fertility

Megatrend 4. Changes in the political and macroeconomic environment

23. Shortages in raw materials an issue
24. State capitalism returning (governmental intervention in economy)
25. Increase in public debts
26. Protectionism
27. Global migration
28. Breaking of the Euro
29. Breaking of the European Union
30. Return of religion and rising Islamism
31. Political instability and dissolution of traditional party affiliation
32. Political polarisation in societies
33. Increasing income spread between well- and poorly educated
34. Pressure to combine work and family increasing

Megatrend 5. Shift of economic growth centres

35. China and India the most powerful countries in the BRIC and the fastest growing economy in the world.
36. This shift in economic power will displace the centre of gravity for activity from developed countries to developing countries, causing more competition for companies in developed countries.
37. Globalisation and internationally connected supply chains increase.
38. Regionalisation and forming of local clusters.
39. End of global trade expansion.

5. Timetable

This chapter will indicate the future plan for this research and upcoming activities and deadlines.

Table 1: Planning of envisioned master thesis mentioning activities, critical factors and deadlines

		November			December					January				July			
Activities	**Critical factors and deadlines**	**week 45**	**week 46**	**week 47**	**week 48**	**week 49**	**week 50**	**week 51**	**week 52**	**week 01**	**week 02**	**week 03**	**week 04**	**week 01**	**week 02**	**week 03**	**week 04**
Working on research proposal	Hand-in proposal 20-11-2017																
Working on theoretical part	01-12-2017 finished with theoretical part																
micro-trends/hypothesis preparation for survey	Goal:3-4 micro-trends per megatrends																
Discussion hypothesis megatrends with prof. Schiele	Approval of prof. Schiele to start survey.																
Approach participants for survey	Goal: approximately 300 respondents. Sending respondents, a reminder after 2 weeks.																
Analyse results from survey	12-01-2017 after waiting a month for results																
Write conclusion/limitations and further research	As soon as possible																
Receive green light and discuss date for defend.																	

Source: own elaboration

6. Results

6.1 Data Analysis

To test the importance of the megatrends the survey consisted of several methods to get concrete data. First of all, a Likert-scale is used for the megatrends and micro-trends. Next to this the performance of the companies are illustrated. To determine which megatrend has the most importance a ranking has been conducted. Figure 16 shows the means of the total sample as well as the means of the manufacturing firms, service firms and public firms. The means of the best and worst performance companies are illustrated as well in figure 21. In figure 22 the ranking of the megatrends is illustrated.

Figure 21: total descriptive statistics means.

Total

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	3,93	0,54	123
Acceleration of innovation	3,88	0,48	123
Demographic change	3,62	0,54	123
Changes in the political and macroeconomic environment	3,14	0,56	123
Shift of economic growth centres	3,49	0,53	123

Industrial

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	3,83	0,54	67
Acceleration of innovation	3,78	0,51	67
Demographic change	3,56	0,51	67
Changes in the political and macroeconomic environment	3,07	0,53	67
Shift of economic growth centres	3,51	0,49	67

Public Sector

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	4,00	0,46	31
Acceleration of innovation	3,90	0,48	31
Demographic change	3,58	0,50	31
Changes in the political and macroeconomic environment	3,19	0,67	31

Shift of economic growth centres	3,35	0,56	31

Service

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	4,12	0,56	25
Acceleration of innovation	4,10	0,32	25
Demographic change	3,81	0,64	25
Changes in the political and macroeconomic environment	3,28	0,48	25
Shift of economic growth centres	3,60	0,60	25

Best performance firms top 25%

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	3,93	0,64	30
Acceleration of innovation	3,90	0,53	30
Demographic change	3,67	0,53	30
Changes in the political and macroeconomic environment	3,19	0,64	30
Shift of economic growth centres	3,49	0,58	30

Worst performance firms top 25%

	Mean	Standard Deviation	Count
CSR: increase of environmental and social responsibility	3,86	0,62	30
Acceleration of innovation	3,85	0,48	30
Demographic change	3,64	0,55	30
Changes in the political and macroeconomic environment	3,23	0,63	30
Shift of economic growth centres	3,45	0,66	30

Figure 22: multiplied ranking

Rank 1		Frequency	Percent	Valid Percent	Cumulative Percent	Multiplied Ranking
Valid	Increase of environmental and social responsibility (CSR)	28	22,8	22,8	22,8	140
	Demographic change	9	7,3	7,3	30,1	45
	Acceleration of	55	44,7	44,7	74,8	**275**

	innovation					
	Changes in political and macroeconomic environment	12	9,8	9,8	84,6	60
	Shift of economic growth centres	19	15,4	15,4	100,0	95
	Total	123	100,0	100,0		

Rank 2		Frequency	Percent	Valid Percent	Cumulative Percent	Multiplied Ranking
Valid	Increase of environmental and social responsibility (CSR)	21	17,1	17,1	17,1	84
	Demographic change	21	17,1	17,1	34,1	84
	Acceleration of innovation	28	22,8	22,8	56,9	**112**
	Changes in political and macroeconomic environment	25	20,3	20,3	77,2	100
	Shift of economic growth centres	28	22,8	22,8	100,0	**112**
	Total	123	100,0	100,0		

Rank 3		Frequency	Percent	Valid Percent	Cumulative Percent	Multiplied Ranking
Valid	Increase of environmental and social responsibility (CSR)	32	26,0	26,0	26,0	**96**
	Demographic change	21	17,1	17,1	43,1	63
	Acceleration of innovation	21	17,1	17,1	60,2	63
	Changes in political and macroeconomic environment	22	17,9	17,9	78,0	66
	Shift of economic growth centres	27	22,0	22,0	100,0	81
	Total	123	100,0	100,0		

Rank 4		Frequency	Percent	Valid Percent	Cumulative Percent	Multiplied Ranking
Valid	Increase of environmental and social responsibility (CSR)	20	16,3	16,3	16,3	40
	Demographic change	37	30,1	30,1	46,3	**74**

	Acceleration of innovation	12	9,8	9,8	56,1	24
	Changes in political and macroeconomic environment	35	28,5	28,5	84,6	70
	Shift of economic growth centres	19	15,4	15,4	100,0	38
	Total	123	100,0	100,0		

Rank 5		Frequency	Percent	Valid Percent	Cumulative Percent	Multiplied Ranking
Valid	Increase of environmental and social responsibility (CSR)	22	17,9	17,9	17,9	22
	Demographic change	35	28,5	28,5	46,3	**35**
	Acceleration of innovation	7	5,7	5,7	52,0	7
	Changes in political and macroeconomic environment	29	23,6	23,6	75,6	29
	Shift of economic growth centres	30	24,4	24,4	100,0	30
	Total	123	100,0	100,0		

The five determined megatrends from the theoretic framework have been through a survey by professionals in procurement and supply management. The respondents were shown 39 micro-trends grouped in the five megatrends and asked how important these trends are in the form of a Likert-scale. The results show difference outcomes based on the industry they are in. Overall, the megatrends CSR: increase of environmental and social responsibility scored the highest with a mean of 3,93 on the Likert-scale. Next is the acceleration of innovation with a score of 3,88. Looking at the three industries: industrial, public and service some similar scores can be noticed. The industrial sector shows a 3,83 of mean score for CSR: increase of environmental and social responsibility and 3,78 for acceleration of innovation. The public sector has a mean score of 4,00 for CSR: increase of environmental and social responsibility and 3,90 for acceleration of innovation. The service sector shows a mean score of 4,12 for CSR: increase of environmental and social responsibility and 4,10 for acceleration of innovation. To check whether there is a difference between scores based on the firm's performance the respondents were also asked question on their performance. The scores again show that CSR: increase of environmental and social responsibility and acceleration of innovation are on top.

So, all the groups show a similar ranking in megatrends with CSR on top, second acceleration of innovation, third demographic change, fourth shift of economic growth centres and lastly changes in the political and macroeconomic environment.

During the survey the respondents were also asked to rank the megatrends individually. The results are shown in figure 22. The table shows the number of votes on each megatrend on every rank. To determine the difference between the ranks a multiplied form of ranking has been used. The multiplied ranking multiplies rank one by a number of five, rank two multiplied by four, ranking three multiplied by three, rank four multiplied by two and rank five multiplied by one. Acceleration of innovation comes up the most on rank one with 55 votes and a multiplied score of 275. Rank two has a score of 112 which has two megatrends that came up on top, respectively acceleration of innovation and shift of economic growth centres. CSR: increase of environmental and social responsibility has come up on top in rank three with a score of 96. Rank four shows a score of 74 for demographic change and rank five has demographic change as well with a score of 35.

Figure 23: descriptive statistics of the new megatrends

New megatrends total

	Mean	Standard Deviation	Count
Political and demographic change	3.55	.58	123
CSR: increase of environmental and social responsibility	3.87	.52	123
Industry 4.0	4.28	.55	123
Instability of the European Union	2.58	.79	123
Acceleration of innovation	3.58	.57	123
Shift of economic growth centres	3.73	.57	123

New megatrends industrial

	Mean	Standard Deviation	Count
Political and demographic change	3,46	,58	67
CSR: increase of environmental and social responsibility	3,78	,54	67
Industry 4.0	4,16	,56	67
Instability of the European Union	2,53	,78	67
Acceleration of innovation	3,51	,61	67
Shift of economic growth centres	3,76	,54	67

New megatrends service

	Mean	Standard Deviation	Count
Political and demographic change	3,62	,61	31
CSR: increase of environmental and social responsibility	3,93	,43	31
Industry 4.0	4,31	,58	31

Instability of the European Union	2,62	,91	31
Acceleration of innovation	3,56	,53	31
Shift of economic growth centres	3,56	,61	31

New megatrends public sector

	Mean	Standard Deviation	Count
Political and demographic change	3,72	,51	25
CSR: increase of environmental and social responsibility	4,03	,52	25
Industry 4.0	4,58	,35	25
Instability of the European Union	2,66	,68	25
Acceleration of innovation	3,76	,48	25
Shift of economic growth centres	3,86	,56	25

Best performance firms top 25%

	Mean	Standard Deviation	Count
Political and demographic change	3.58	.62	30
CSR: increase of environmental and social responsibility	3.88	.60	30
Industry 4.0	4.31	1.01	30
Instability of the European Union	2.67	.63	30
Acceleration of innovation	3.61	.57	30
Shift of economic growth centres	3.74	.62	30

Worst performance firms top 25%

	Mean	Standard Deviation	Count
Political and demographic change	3.71	.65	30
CSR: increase of environmental and social responsibility	3.81	.58	30
Industry 4.0	4.23	.51	30
Instability of the European Union	2.53	.85	30
Acceleration of innovation	3.60	.63	30
Shift of economic growth centres	3.62	.69	30

A factor analysis has been conducted using the principal component analysis. To check whether the 39 micro-trends form anything different from the five determined megatrends. The factor analysis came back with quite something new. In appendix D the factor analysis can be seen. In fact, the analysis shows that there are actually six megatrends. The megatrend acceleration of innovation has been split up in two trends. And a quite new trend has appeared as well. These new megatrends are:

- Political and demographic change
- CSR: increase of environmental and social responsibility
- Industry 4.0
- Instability of the European Union
- Acceleration of innovation
- Shift of economic growth centres

The importance of each of these new megatrends have also been tested. The total means of each megatrend has been shown. The means for the industry have been shown as well and the best and worst firms are also illustrated. Figure 23 shows the descriptive statistics of the new megatrends. Seen in the table the new megatrend: Industry 4.0 shows the highest score with a mean score of 4,28 on the Likert scale. Looking at the industries and performance of the firm's industry 4.0 comes up on top on all of them. The least important megatrend that shows up the lowest on all groups is "Instability of the European Union" with a mean score of 2,58. However the other four megatrends are quite different in importance within the groups.

All groups from most important to least:

All respondents:

1. Industry 4.0,
2. CSR
3. Shift of economic growth centres
4. Acceleration of innovation
5. Political and demographic change
6. Instability of the European Union

Industrial:

1. Industry 4.0,
2. CSR
3. Shift of economic growth centres
4. Acceleration of innovation
5. Political and demographic change
6. Instability of the European Union

Service:

1. Industry 4.0,
2. CSR
3. Political and demographic change
4. Shift of economic growth centres and also acceleration of innovation
5. Instability of the European Union

Public:

1. Industry 4.0,
2. CSR
3. Shift of economic growth centres
4. Acceleration of innovation

5. Political and demographic change
6. Instability of the European Union

Best performance:

1. Industry 4.0,
2. CSR
3. Shift of economic growth centres
4. Acceleration of innovation
5. Political and demographic change
6. Instability of the European Union

Best performance:

1. Industry 4.0,
2. CSR
3. Political and demographic change
4. Shift of economic growth centres
5. Acceleration of innovation
6. Instability of the European Union

There is a small group that supports the megatrend of the instability of the European Union, this group consists of 12 people. This trend describes the challenges in the European Union, for instance the departure of Great Britain from the EU. The survey showed that there is no significant importance in this megatrend. Figure 24 shows these results. These 12 people think the instability of the European union is the most important trend. Looking at the age, job-title and industry there don't seem to be any interesting correlation, it is a diverse group except for the industry, which are seven of the 12 people.

Figure 24: Instability of the European Union group

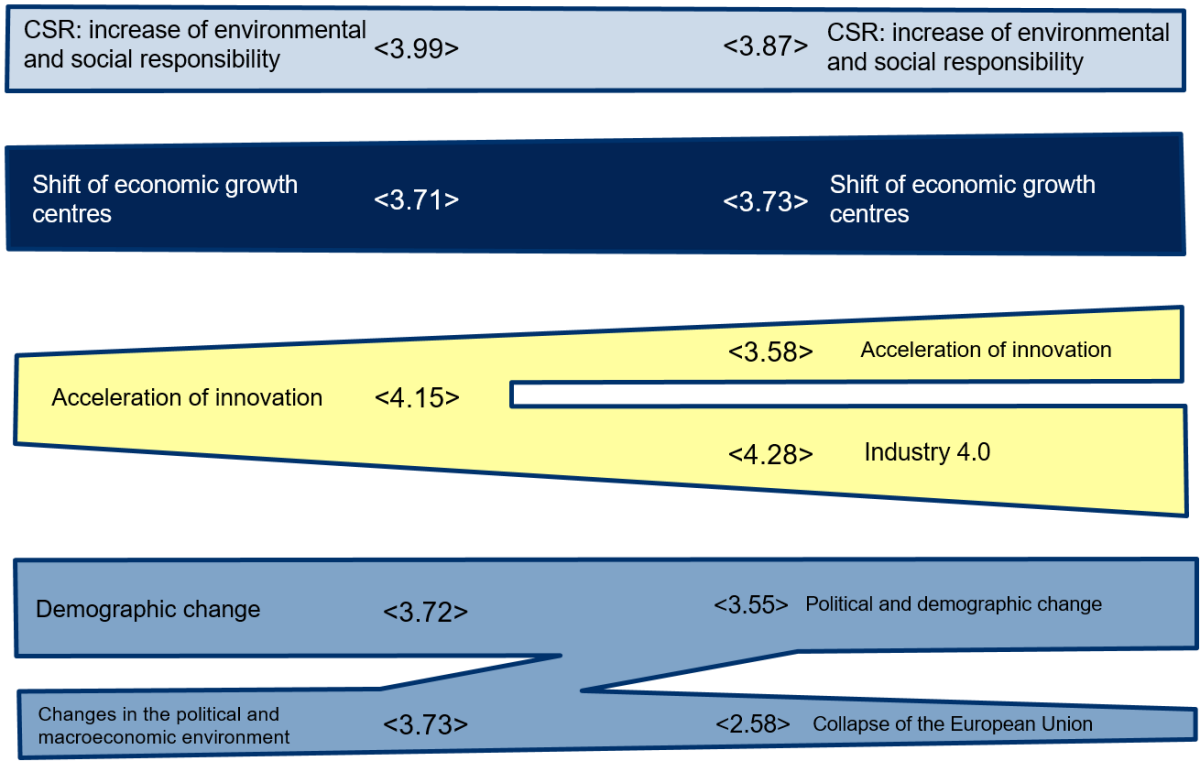
Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Political and demographic change	12	2,50	4,38	3,7917	,50095
CSR: increase of environmental and social responsibility	12	3,00	4,75	3,7813	,45889
Industry 4.0	12	3,25	5,00	4,2917	,62915
Instability of the European Union	12	3,75	5,00	4,1667	,44381
Acceleration of innovation	12	2,60	4,20	3,6167	,53570
Shift of economic growth centres	12	3,50	5,00	4,2083	,47474
Valid N (listwise)	12				

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23-30 year	2	16,7	16,7	16,7
	31-40 year	3	25,0	25,0	41,7
	41-50 year	3	25,0	25,0	66,7
	51-60 year	2	16,7	16,7	83,3
	61-80 year	2	16,7	16,7	100,0
	Total	12	100,0	100,0	

Job title		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	(Senior)buyer	5	41,7	41,7	41,7
	Advisor	1	8,3	8,3	50,0
	Consultant	1	8,3	8,3	58,3
	Corporate Officer	1	8,3	8,3	66,7
	Head Procurement	2	16,7	16,7	83,3
	Manager	1	8,3	8,3	91,7
	Procurement Professional	1	8,3	8,3	100,0

	Total	12	100,0	100,0	
Industry		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chemical	1	8,3	8,3	8,3
	Food and drink	1	8,3	8,3	16,7
	Healthcare	1	8,3	8,3	25,0
	Oil and/or gas	1	8,3	8,3	33,3
	Other	3	25,0	25,0	58,3
	Public sector	4	33,3	33,3	91,7
	Services	1	8,3	8,3	100,0
	Total	12	100,0	100,0	

Figure 25: megatrends 2010 in comparison with the megatrends for 2018



The new megatrends from 2018 and beyond. Figure 25 shows the comparison from the megatrends of 2010. The numbers shown are the scores of the Likert-type scale which asked the respondents how important they think the megatrends are from a number of one to five.

1. **Corporate Social Responsibility (CSR):** CSR is still important and getting more attention. Consumers demanding more sustainability from companies. Consumers demand companies to be held responsible for their actions. The technological advancements have really helped this trend, for instance social media has caused a bigger impact on this trend. News can spread much faster.

2. **Shift of economic growth centres:** Economic powers are shifting more towards the east. There is not just one economic power anymore but there are several big ones.

3. **Acceleration of innovation:** Technological innovation is still today a subject that keeps getting important and companies need to keep up with new developments.

4. **Industry 4.0:** Industry 4.0 is the so called fourth industrial revolution that is and has been occurring. The way of producing is changing thanks to cyber-physical systems with the help of autonomous machine-t-machine communication or better called the Internet-of-Things (IoT).

5. **Political land demographic change:** due to political destabilization this has become an important megatrend. The increase of legislation is also an influence of this. Furthermore, the decline of birth numbers in big parts of the world with the effect of the aging of people.

6. **Instability of the European Union (*wild card*):** the reason why this megatrend is called the 'wild card' is because it is a totally new megatrend that has come out of the research where there is no consensus for yet. Of all the megatrends this is the one that has scored the lowest in importance. Just ten percent of the respondents sees this trend and the ones that do see it think it is one of the most influential trends at the moment.

6.2 Missing megatrends and implications on procurement

In the next part of the survey the respondents were asked several open questions. The first open question was whether there was a trend missing from the five megatrends. The second open question was what the respondents think the implications are for procurement.

6.2.1 Missing trends

The open questions are summarized in this paragraph. Of the 123 respondents only 22 thought there was a trend missing. In appendix C the full unchanged list has been added. The following trends are missing according to the respondents:

- Ways and methods of procurement.
- Change of systems/modalities in transport due to increasing problems in capacity.
- Use of artificial intelligence and robotization will disrupt our concept of work.
- Climate change
- Increase of conglomerates

- The power of China and USA going to the stage of being a developing country.
- The combination of AI, neurosciences and robotics and the impact on markets and society.
- Supply Chain Integration, upstream and downstream Cradle to Cradle
- Shift in import and export shares of countries (megatrend five)
- Together working together.
- Robotics and 3D printing
- Acceleration of innovation - shift of innovation centres in the world
- Blockchain and social economic developments.
- Influence of cryptocurrencies on the international markets (blockchain)
- Impact of fake news on consumer behaviour.
- China and India in the same trend. Mass customization.
- Circular economy: buying services (‘light as a service') instead of products.
- Anti-technology (social media trend)
- Global warming, nature, climate change
- Definition of welfare, changed view on possessions and assets and the value of currency.
- Brexit
- Blockchain and artificial intelligence

6.2.2 Implications for procurement.

The respondent where asked what kinds of implications these megatrends could have for procurement. The implications on procurement are summarized in this paragraph and in appendix D the implications are put against their respective megatrends as well with the full unchanged list found in appendix E.

Megatrend 1 – Corporate Social Responsibility (CSR)
CSR will have a more important role and according to the survey will have a big impact. CSR is on the agenda in many organizations due to implementations of new legislation by governments. Companies will be held more and more responsible for their actions by the end-user.

Megatrend 2 – Shift of economic growth centres
The shift in the economic growth centres has begun and many companies are localized in the wrong areas. There will not be just one economic power but several. This is all because of the globalization and technological advancement. Because of automation and production costs this will bring production more to local companies.

Megatrend 3 – Acceleration of innovation.
The success of companies will be more dependable of suppliers of technology and because of the speed of innovation there is a better economic life span of products. A new micro trend shows that there is more interest in innovative start-ups. Research at the university of Twente has shown that there is a need for a different approach to procurement of innovations, because the current processes are just too slow.

Megatrend 4 – Industry 4.0
From a technological view most agree that automation will replace the operational part of procurement. The topic about the applications of industry 4.0 has seen a healthy growth. For

instance, thanks to industry 4.0 automatic demand recognition in supply are possible. The role of the person in negotiations could also be replaced, since there is already a system that is possible to conduct automatic negotiations.

Megatrend 5 – Political and demographic changes
The shortage of good procurement professionals will cause problems for companies. The University of Twente is currently the only university with the specialization in purchasing and supply management in the Netherlands. The "War for Talent" is becoming bigger in the procurement world. Supply chains will be changing in the future. There will be less need for mass production and more need for specialized products. The specialized production will make things difficult. Procurement will have to develop the so called agile purchasing approach. This means that procurement will have to be faster and decisive to reduce reaction time. Furthermore, this megatrend still shows that there is a shortage of raw materials and procurement professionals will have to be looking more from a macro-economic and ecologic view to the job. A different threat from this megatrend is the growth in legislations and the political pressure on tenders which procurement is working with. Further instability is projected due to the political changes.

Megatrend 6 – Wildcard: Instability of the European Union. A small group of the survey is thinking that instability of the European Union will have a great impact. In case this happens, procurement needs to develop risk models and needs to translate this to contracts. In what currency will future contracts be made when the involved parties are not using the Euro anymore?

7. Discussion and Conclusion

Initially the importance of the five megatrends where tested and afterwards with the results it was checked whether the trends are accurate. Based on the Likert-type question from the 39 micro-trends, the megatrend CSR: increase of environmental and social responsibility was perceived as the most important and changes in the political and macroeconomic environment as the lowest. The respondents were also asked in which industry they are. The biggest difference comes from the service sector, they gave the highest scores in the survey with 4,12 on average on CSR: increase of environmental and social responsibility and 4,10 on acceleration of innovation. All analysed groups combined find CSR: increase of environmental and social responsibility the most important trend.

However, the respondents were asked to rank the five determined megatrends in importance. The results of the ranking show a different ranking than the Likert-type:

1. Acceleration of innovation
2. Acceleration of innovation and Shift of economic growth centres
3. Increase of environmental and social responsibility (CSR)
4. Demographic change
5. Demographic change

The ranking shows something interesting, in fact the acceleration of innovation comes up on the first and second place. Changes in political and macroeconomic environment has not been important enough to come up on the ranking.
To further test the importance of the megatrend a factor analysis was conducted and to see if the five determined megatrends are accurate. The factor analysis showed a different perspective, in fact six megatrends came out. These new megatrends are:

1. industry 4.0,
2. CSR increase of environmental and social responsibility
3. shift of economic growth centres
4. acceleration of innovation
5. political and demographic change
6. Instability of the European Union

Industry 4.0 was perceived as the most important. The Instability of the European Union was shown to be the weakest. However, a small group of 12 respondents found this trend to be the most important, but there was nothing special compared to the total group, since this was a diverse group. Except seven of the 12 people are from the group industrial.
The respondents were asked whether there were any trends missing in the first question. The trends that came up the most are in relation with technology, climate change and the power of China. Next to this the respondents were also asked for their own input on the implications of the megatrends on procurement. These implications where put in the new megatrends.
Looking at the megatrend acceleration of innovation, most respondent agree that companies/governments needing to keep up with the technological advancements. The megatrend Industry 4.0 shows that automation/robotization will be replacing the operational part of procurement. Looking at CSR: increase of environmental and social responsibility the respondents mostly agree on this megatrend being important as well and becoming a more

important issue in the future. In the megatrend political and demographic change the implication that comes up the most is the war for talent, procurement professionals will be needed more in the future. From a political view shortage in raw materials, more legislation and political pressure are issues that are mentioned often. Megatrend shift of economic growth centres is showing that globalisation will have an impact on procurement.

This research showed some interesting views on how professionals in procurement think about the megatrends. When the respondents were asked to rank the megatrends, they found different megatrends more important than what came out of the Likert-type questions. Creating a factor analysis even showed new megatrends.

8. Limitations & future recommendations

This research had some limitations. The study mainly gained respondents from the Netherlands. If focused on procurement professionals in different regions of the world could provide different input compared to the respondents from the Netherlands. For instance, China and India are often mentioned and found to be an interesting trend. It would be interesting to see what procurement professionals from those regions would think about those trends.

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Appendix A: questionnaire

Megatrends and their implications for procurement.

Thank you for agreeing to take part in this survey. My name is Soran Bapeer, I am a masterstudent at the University of Twente. On behalf of the University of Twente, commissioned by prof.dr. Holger Schiele I am conducting my thesis on the megatrends and their implication on procurement. For the quantitative part of the thesis input is needed from professionals in the field of procurement/SCM. This is where I need your professional opinion.

The entire survey takes approximately 10-15 minutes and your responses are completely anonymous.

The main language for this survey is English, but you can change it to Dutch if you prefer.

For any questions regarding the survey, please contact me: S.bapeer@student.utwente.nl.

Kind regards,

Soran Bapeer

There are 14 questions in this survey

Micro-trends

Please indicate how much you agree with the following micro-trends for the future.

(1 = "Strongly disagree") (2 = "Disagree") (3 = "More or less") (4 = "Agree") (5 ="Strongly Agree")

Megatrend 1. CSR: increase of environmental and social responsibility

These trends are important for the future:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
Stronger consumer request concerning ethical and CSR activities	○	○	○	○	○
Governmental pressure on corporate social responsibility	○	○	○	○	○
Increasing environmental legislation forces firms to change their behaviour.	○	○	○	○	○

Trend for environmental products with consumers	○	○	○	○	○
Shift to renewable energy	○	○	○	○	○
Climate change	○	○	○	○	○

Megatrend 2. Acceleration of innovation

These trends are important for the future:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
Automation and digitalisation	○	○	○	○	○
Industry 4.0, internet-of-things applications (cyber-physical systems, new autonomous production forms)	○	○	○	○	○
Machine-to-machine communication and artificial intelligence	○	○	○	○	○
Speeding-up of technological development	○	○	○	○	○
Novel transportation decreasing transport costs (drones, autonomous driving etc.)	○	○	○	○	○
E-mobility	○	○	○	○	○
Entrepreneurship rising (start-up wave)	○	○	○	○	○
Innovations in network rather than in in-house laboratory (open innovation)	○	○	○	○	○
Mass customisation: consumers demanding more individualised products	○	○	○	○	○
Smart and sustainable cities	○	○	○	○	○

Megatrend 3. Demographic change

These trends are important for the future:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
Population ageing becoming a more serious issue,	○	○	○	○	○
"War for talent" arising (lack of educated workforce)	○	○	○	○	○
Developing countries growing talent pool	○	○	○	○	○
Overpopulation in developing countries	○	○	○	○	○
Urbanisation (cities will gain on rural areas in population)	○	○	○	○	○
Challenges in health and social systems due to decreasing fertility	○	○	○	○	○

Megatrend 4. Changes in the political and macroeconomic environment

These trends are important for the future:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
Shortages in raw materials an issue	○	○	○	○	○
State capitalism returning (governmental intervention in economy)	○	○	○	○	○
Increase in public debts	○	○	○	○	○
Protectionism	○	○	○	○	○
Global migration	○	○	○	○	○
Breaking of the Euro	○	○	○	○	○
Breaking of the European Union	○	○	○	○	○
Return of religion and rising Islamism	○	○	○	○	○
Political instability and dissolution of traditional party affiliation	○	○	○	○	○
Political polarisation in societies	○	○	○	○	○

Increasing income spread between well- and poorly educated	○	○	○	○	○
Pressure to combine work and family increasing	○	○	○	○	○

Megatrend 5. Shift of economic growth centres

These trends are important for the future:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
China and India the most powerful countries in the BRIC and the fastest growing economiein the world.	○	○	○	○	○
This shift in economic power will displace the centre of gravity for activity from developed countries to developing countries, causing more competition for companies in developed countries	○	○	○	○	○
Globalisation and internationally connected supply chains increase	○	○	○	○	○
Regionalisation and forming of local clusters	○	○	○	○	○
End of global trade expansion	○	○	○	○	○

Do you think a trend is missing?

Please write your answer here:

Megatrends

In literature, often the following five megatrends have been identified. Could you bring them in a ranking of importance? *

All your answers must be different and you must rank in order.

Please number each box in order of preference from 1 to 5

- Increase of environmental and social responsibility (CSR)

- Demographic change
- Acceleration of technological progress
- Changes in political and macroeconomic environment
- Shift of economic growth centres

What do you think the implications of these megatrends are for procurement?

Please write your answer here:

Succes of the company

Questions regarding the company your work at.

The company I work for has the following properties:

*Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree
Our growth in sales is very good.	○	○	○	○	○
Our return on assets (profitability) is very good.	○	○	○	○	○
Our market share gain is substantial.	○	○	○	○	○
We are very satisfied with our overall competitive position.	○	○	○	○	○
We are more innovative than our competitors.	○	○	○	○	○
We will adapt to the future trends.	○	○	○	○	○
We will have a strong future.	○	○	○	○	○
We will gain competitive advantage	○	○	○	○	○

Personally, I feel: *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	More or less	Agree	Strongly agree

Well informed about future trends	○	○	○	○	○
That I have enough information to evaluate our world's development	○	○	○	○	○
Well prepared to seize the future	○	○	○	○	○
Confused about the developments going on	○	○	○	○	○
It is difficult to make any trend prognoses	○	○	○	○	○

General questions

How old are you? *

Only numbers may be entered in this field.

Please write your answer here:

What is you position? *

Please write your answer here:

Which is the industry you are in? *

Please write your answer here:

In which country are you working? *

Please write your answer here:

Thank you for participating in the survey!

For any questions regarding the survey, please contact me: **S.bapeer@student.utwente.nl.**

Kind regards, Soran Bapeer

04-04-2018 – 15:01

Submit your survey.
Thank you for completing this survey.

Appendix B: Factor analysis

	Rotated Component Matrixa					
		Component				
		pol/demog	CSR	I4.0	challenges to Eur	innovation manag	Global
4	[Stronger consumer request concerning ethical and CSR activities] Megatrend 1. CSR: increase	-0,158	0,570	0,353	-0,008	0,135	0,195
5	[Governmental pressure on corporate social responsibility] Megatrend 1. CSR: increase of	0,138	0,558	0,039	-0,139	0,131	-0,079
6	[Increasing environmental legislation forces firms to change their behaviour.] Megatrend 1. CSR:	-0,040	0,431	0,348	0,141	-0,228	0,059
7	[Trend for environmental products with consumers] Megatrend 1. CSR: increase of	-0,041	0,634	-0,061	0,068	0,258	0,268
8	[Shift to renewable energy] Megatrend 1. CSR: increase of environmental and social	0,191	0,488	0,073	-0,276	-0,004	0,262
9	[Climate change] Megatrend 1. CSR: increase of environmental and social responsibility These	0,036	0,694	0,121	-0,119	-0,073	0,067
10	[Automation and digitalisation] Megatrend 2. Acceleration of innovation These trends are	0,089	0,111	0,595	-0,062	0,106	0,053
11	[Industry 4.0, internet-of-things applications (cyber-physical systems, new autonomous	-0,002	0,117	0,668	-0,015	0,350	0,105
12	[Machine-to-machine communication and artificial intelligence] Megatrend 2. Acceleration of	-0,021	-0,018	0,780	0,058	0,247	0,068
13	[Speeding-up of technological development] Megatrend 2. Acceleration of innovation These	0,130	0,257	0,589	0,075	0,246	-0,128
14	[Novel transportation decreasing transport costs (drones, autonomous driving etc.)] Megatrend	0,106	0,455	0,058	0,041	0,594	-0,110
15	[E-mobility] Megatrend 2. Acceleration of innovation These trends are important for the future:	0,171	0,577	0,009	0,149	0,322	-0,110
16	[Entrepreneurship rising (start-up wave)] Megatrend 2. Acceleration of innovation These trends	0,034	0,183	0,173	-0,002	0,654	0,091
17	[Innovations in network rather than in in-house laboratory (open innovation)] Megatrend 2.	0,241	-0,011	0,255	0,034	0,548	-0,029
18	[Mass customisation: consumers demanding more individualised products] Megatrend 2.	0,074	0,208	0,217	0,162	0,447	0,018
19	[Smart and sustainable cities] Megatrend 2. Acceleration of innovation These trends are	0,146	0,386	0,201	0,187	0,216	0,172
20	**[Population ageing becoming a more serious issue,] Megatrend 3. Demographic change**	0,547	-0,025	0,052	-0,286	0,133	-0,029
21	["War for talent" arising (lack of educated workforce)] Megatrend 3. Demographic change	0,429	-0,148	0,223	-0,233	0,228	0,099
22	[Developing countries growing talent pool] Megatrend 3. Demographic change These trends	0,113	-0,004	0,241	0,022	0,509	0,272
23	[Overpopulation in developing countries] Megatrend 3. Demographic change These trends are	0,388	0,286	-0,064	-0,010	0,183	0,264
24	[Urbanisation (cities will gain on rural areas in population)] Megatrend 3. Demographic change	0,255	0,317	0,263	0,009	0,275	0,197
25	[Challenges in health and social systems due to decreasing fertility] Megatrend 3. Demographic	0,339	0,143	-0,028	0,031	0,241	0,316
26	**[Shortages in raw materials an issue] Megatrend 4. Changes in the political and**	0,659	0,151	0,192	0,123	-0,154	0,099
27	**[State capitalism returning (governmental intervention in economy)] Megatrend 4.**	0,588	0,120	-0,077	0,130	0,165	0,128
28	**[Increase in public debts] Megatrend 4. Changes in the political and macroeconomic**	0,605	0,205	-0,107	0,264	0,258	0,185
29	**[Protectionism] Megatrend 4. Changes in the political and macroeconomic environment**	0,422	0,052	0,040	0,384	0,121	-0,091
30	**[Global migration] Megatrend 4. Changes in the political and macroeconomic**	0,616	-0,067	0,020	0,187	0,117	0,178
31	[Breaking of the Euro] Megatrend 4. Changes in the political and macroeconomic environment	-0,065	-0,109	-0,099	0,753	0,150	0,274
32	[Breaking of the European Union] Megatrend 4. Changes in the political and macroeconomic	-0,029	-0,136	0,022	0,801	0,009	0,175
33	[Return of religion and rising Islamism] Megatrend 4. Changes in the political and	0,365	0,160	0,100	0,628	-0,090	-0,045
34	[Political instability and dissolution of traditional party affiliation] Megatrend 4. Changes in the	0,287	-0,016	0,178	0,569	0,098	0,029
35	[Political polarisation in societies] Megatrend 4. Changes in the political and macroeconomic	0,400	0,040	0,367	0,305	-0,106	0,244
36	[Increasing income spread between well- and poorly educated] Megatrend 4. Changes in the	0,459	0,108	0,365	0,113	-0,155	0,180
37	[Pressure to combine work and family increasing] Megatrend 4. Changes in the political and	0,141	0,155	-0,058	0,063	-0,083	0,473
38	[China and India the most powerful countries in the BRIC and the fastest growing economiein the	0,171	0,051	0,103	0,049	-0,034	0,694
39	[This shift in economic power will displace the centre of gravity for activity from developed	0,162	-0,156	0,242	-0,073	0,066	0,617
40	[Globalisation and internationally connected supply chains increase] Megatrend 5. Shift of	0,036	0,241	0,302	0,140	0,018	0,504
41	[Regionalisation and forming of local clusters] Megatrend 5. Shift of economic growth centres	0,006	0,141	-0,025	0,182	0,192	0,465
42	[End of global trade expansion] Megatrend 5. Shift of economic growth centres These trends	0,095	-0,072	-0,174	0,304	0,245	0,370
43	Extraction Method: Principal Component Analysis.						
44	a. Rotation converged in 10 iterations.						

Appendix C: Missing trends

- Ways and methods pf procurement.
- Verandering van systemen/modaliteiten in het transport door de toenemende capaciteitsproblemen. E.e.a. verstoord bestaande supply chain structuren
- Use of artificial intelligence and robotization will disrupt our concept of work.People in developed countries will have more free time and what to do with it?How to feed 9 billion people in 2050?
- Trends m.b.t. klimaatverandering: denk aan toegang tot drinkwater, vermindering van CO2 uitstoot, realisering meer duurzaam opgewekte energie, toegang tot noodzakelijk kapitaal. We zijn nog maar net begonnen.
- Toename van conglomeraten
- The power of China: Without attention China has bought sources of raw materials and companies all over the world. A new strong world power is growing every day and will rule the world shortly. USA will go to the stage of developing country. Some other countries in the western world have the risk to go also this way.
- The combination of AI, neurosciences and robotics andthr impact on markets and society
- Supply Chain Integration, upstream and downstreamCradle to Cradle
- Shift in import and export shares of countries (megatrend 5)
- samenwerkend samenwerken mis ik als trend. Ik zie dat organisaties aan het eind zijn gekomen van hun huidige structuur. We zullen meer schouder aan schouder moeten gaan werken allen in dienst van de missie van een organisatie. Een missie die boven de individuele doelen uitstijgt en die het geheel een voordeel bieden. Op die manier werk je met zijn alleen aan hetzelfde doel en zal de hiërarchie meer komen te vervallen en zal iedereen vanuit eigen verantwoordelijkheid gaan werken. We zullen het wereldwijd samen moeten doen; we hebben slechts 1 aarde en daar zijn we met zijn allen verantwoordelijk voor. Wanneer dat niet (h)erkent wordt zal, na aanvankelijke chaos, dat inzicht ontstaan en gaan mensen toch samenwerken. Zie het als de organisch geheel
- Robotisering, 3d printing
- Megatrend 2. Acceleration of innovation - shift of innovation centres in the world - in the past USA and nowadays for sure China - less innovation in India
- Ja, blockchain. En sociaal economische ontwikkelingen (zoals het feit dat bezit minder belangrijk wordt voor de nieuwe generatie
- Influence of cryptocurrencies on the international market
- Impact van Fake-news op consumenten gedrag in de toekomst,De betrouwbaarheid van media (wereldwijd) wordt op de proef gesteld en de discussie wordt of zal meer door een grote groep worden gevoerd ipv de huidige situatie waar de minderheid de discussie bedenkt, bepaalt en voert.
- I would look at China and India in the same trend. Very different economical and political approaches and speed.I would have added "mass customization" of production. For example, 3D printing of prototypes, small production runs and difficult to obtain or expensive spare parts. This changes the total inventory optimization and warehousing model for several busienss models.
- I think of the trend of circular economy: buying services ("light as a service') instead of products will be noticeable as well

- Hoewel ICT en technologie toenemen en steeds meer toepassingen vinden, groeit er volgens mij ook een golf aan ant-techno geluiden, met name daar waar ze raken aan sociale netwerken (FB, instagram, forums, etc.), publieke veroordeling en discriminatie, anonimiteit van het internet, behoefte aan het wegdoen van 'verslavende' telefoons, ongelukken op de weg door app-ende bestuurders, etc. Dit raakt niet zozeer de supply chain wereld, maar lijkt me een sociale trend die in opkomst is.
- Effect natuur, global warming, etc. op economie
- Definition of well-fareChanged view on possessions and assetsThe value of currency
- Brexit
- Blockchain technologieArtificial intelligence

Appendix D: implications for procurement within their megatrends

Megatrends	Implications
Acceleration of innovation	Procurement needs to keep up with technological solutions. Blockchain becomes more important, will change the system of make or buy. Government needs to support innovative companies. NPD combined with new developed raw materials will shift to new developed areas. Success of companies will be more dependent of suppliers in terms of technology. Consumers demanding more innovation. Due to speeding up of innovation causing a shorter product life cycle.
Industry 4.0	Automatization/robotization will replace the operational part of procurement. Artificial intelligence for day to day planned ordering. Because of technical and digital progress, the operational part of procurement will in the end probably be done by robots. Connected supply chains will eliminate transactional cost and increase competition
CSR: increase of environmental and social responsibility	CSR will become very important and will have a great impact on the trend. Energy consumption and pollution in view of the growing population will be an important topic. CSR becoming a more important award criteria. Mandator could be held responsible for actions by customers. Mostly on the agenda because of the government. CSR becomes more important in protecting the brand. More stable EU standards for China to invest more in CSR.
Political and demographic change	Shortages in raw materials. Less mass production and more specialities. Connected supply chains will eliminate transactional cost and increase competition.

	Buyers have to look more on a macro-economic & -ecologic perspective in procurement. Protectionism from governments will not be as relevant anymore. Customized products may increase more complexity in supply chain. Increase in procurement with local businesses. Increase in legislation within procurement. The rules of the game are changing, the war for talent and resources is not automatically won by the modern western countries
Shift of economic growth centres	Shortage of good procurement professionals will increase problems for companies. People with different skills will be required. Demographic change will have a demand on the labour market which creates even more opportunities like China and India. War for talent. Cultural diversity will increase within companies. Cost of healthcare will rise. Political pressure on tenders. Less buying power, but equally new export possibilities. Centre of gravity for business is shifting and many businesses have assets in wrong regions. Globalization, interest in new markets as China. Shift for production technologies more towards local production as machine hours cost the same.
Instability of the European Union	Instability due to political changes. Shits in trading by protectionism USA and Brexit. European companies being more dependent from supplies in Asia.

Appendix E: implications for procurement survey data

Open question: What do you think the implications of these megatrends are for procurement?

- Every company will before a data specialist. Procurement needs to keep up with all technological solutions and developments in answer to non technical bying and procuring.
- Verder gaande globalisering zal minder inkoopkracht geven, maar gelijktijdig nieuwe export mogelijkheden geven
- Shortages in raw materials.More complex supply chains.Increase in e-processes.
- M.b.t. inkoop energie, waar ik verantwoordelijk voor ben, niet zo veel. Duurzaam is productie gestuurd, niet vraag gestuurd. Wel stevige problemen m.b.t. betaalbaarheid.
- Criteria waaraan bedrijven moeten voldoen om zaken mee te kunnen doen.
- Companies need to keep in front and cooperate in this. Procurement has the possibility of connecting companies in a cooperative way.
- People: the role of purchaser/vendor manager etc. is changing towards a multi-dimensional profile. In addition to 'following a proces' the profile becomes more of a strategic Thinking ambassador who is capable of 'steering the wheel of value'Supply chain awareness and influence will be of great importance (already is).Blockchain technology will change the system of make or buy, and procurement will change into 'bringing value and trust' for all stakeholders involved.
- Sustainable suppliers; Availability of raw materials; In- and Outsourcing decisions
- het zal niet meer gaan om de goedkoopste maar hoe werken we samen. De vraag "wat kunnen we samen creeren wat in ieders voordeel is" zal steeds meer herkend en leidend worden. We hebben immers allemaal dezelfde grondstoffen nodig. Willen we in harmonie leven zullen we een keer de wijsheid moeten krijgen dat concurreren niet langer een model is om te overleven.
- Dit zijn ontwikkelingen waarbij het voor mij niet duidelijk is.
- Innovation becomes more and more important, there should be more room for governments to support innovative companies that strive to solve a common problem.Another "problem" is that the shortage of good procurement professionals will increase problems for companies and governments as well to really accomplish (environmental) goals. The shift in economic growth centres has been made years ago and hasn't changed the world that much until now, except for a little more tourism from new countries.
- Strategie dient hierop afgestemd te worden. Met name snelheid wordt het sleutelwoord.
- Shorter life cycles. Obsolete management becoming more and more crucial. Electrical OEM (both hardware and software) will become more heavy segment icw Mechanical parts
- More impact
- Difficulty in following supply chain development and new technologies will increase. Increase of procurement with local businesses.Increase in legislation with a negative effect on global supply chain possibilities.
- Andere manier van denken flexabiliteit
- Groot. Vooral schaarste aan grondstoffen en arbeidskracht
- In my perception, new product development / innovation in combination with new developed raw materials will shift the worldwide production template to new developed areas where raw materials are available. Reducing energy consumption and

pollution in the air, in view of the growing population worldwide, will be an important topic too.

- Om in te kunnen spelen op innovatie, dient inkoop meer vanuit een netwerkgedachte te opereren. Er dient als ware een netwerk van partners te worden ontwikkelt die verschillende doelstellingen nastreeft. De relatie wordt hierbij ook steeds belangrijker
- All trends will Require different people with differrent skills. Technology/innovation/big data will speed up everything in the way we work, think and act. CSR will become business as usual and not a trend. Demographic change will have another demand on the labour market which creates even more opportunities for countries like China and India.
- All will influence procurement more or less; CSR is already long time on our radar and I am convinced that in the near future this will be one of the most important award criteria, and the new development most certainly in this area will grow tremendously. Shift of economic growth centers, changes in political and macro environment as also demographic change are more or less of all times and always need to be followed closely from a procurement point of view.
- Nog immer zijn deze geld gedreven. Follow the money.
- Because of technical en digital progress, the operational part of procurement will in the end probably be done by robots. Because of CSR, the mandator could be hold responsible for an ethical, sustainable and social responsible supply chain (of the products they sell) by their customers. Changes in political and macroeconomic environment can lead to a changing supply chain.
- The center of gravity for business is shifting and many production businesses have assets in the wrong regions. This bring cost and supply challenges that are a threat and opportunity for established business.
- Different cost models, different contracts, demanding different social skills from the procurement department
- Voor Inkoop denk ik dat het in open dialoog (blijven) staan met de markt en met kleinere innovatieve marktspelers steeds belangrijker wordt. Dat vraagt geen traditionele inkooptrajecten meer, uitmondend in een duidelijk contract met een vaste prijsafspraak, maar open los-vast verbinding, zonder contract, maar met veel vertrouwen. Daar is durf en experimenteren voor nodig. Daarnaast zijn de demografische ontwikkelingen zo, dat over 10 jaar veel oudere inkopers met pensioen zijn. De vraag naar aanwas met kennis en ervaring zal toenemen en ik verwacht daardoor ook de salarissen van inkopers. Werving op de Duitse, Belgische, Engelse of zelfs verder weg gaat meer gewoon worden denk ik. Tot slot blijft MVO belangrijker worden, maar komt het meestal nog niet op de agenda door idealisme of klantvraag, maar door druk vanuit overheid/wetgeving. De overige twee megatrends hebben naar mijn idee weinig of geen invloed op inkoop/SCM (uiteraard wel op prijzen en verkrijgbaarheid van producten)
- Aanpassing inkoop competenties
- Discussion on viable value chains and the impact of the procurement role.
- Price will be less and less important. We will start to evaluate more and more intro CSR to protect the brand. The brand will bring the money, not the savings. The reason is a stronger media.
- Amazonization
- Inkoop zal moeten inspelen op de snel groeiende innovatie en de vraag hiernaar, wat betekent dat procurement een steeds meer strategische positie in een organisatie gaat

krijgen. Tevens de maatschappelijke druk op duurzaam ondernemen en de veranderende wet- en regelgeving vraagt steeds meer een strategische denkwijze van inkoop. Daar procurement voorheen vooral als bestelfunctie werd gezien zal de functie door deze megatrends zich steeds verder ontwikkelen en organisaties de toegevoegde waarde van procurement beter inschatten. We zijn immers in contact met de gehele organisatie en de bijdrage die deze functie kan leveren aan strategische doelen op deze onderwerpen is ontzettend groot.

- Focus op duurzaamheid; milieuconsequenties, kinderarbeid, CO2 emissie, etc. en transparante supply chains op dit gebied.
- Goed criteria en meting van mvo prestaties
- Meer focus op slimme- en duurzame oplossingen tov prijsfocus
- Major
- Equal currency sourcing to avoid Fx impact.Current LCR are behind in innovation, replaced by BCRShortages on raw materials cause snowball effect, resulting in increased cost and extended lead-times.
- Like within any company discipline they will have to keep up with markets developing.Rapidly changing markets also have to keep big players "smart" while many opportunities might be there to dive in by other smaller companies.
- Verjuridirisering binnen inkoop.
- Inkoop wordt steeds belangrijker voor organisaties. Het goedkoop inkopen, inkoop oude stijl, is al lang niet meer het belangrijkste.
- Globalization, interest in new markets such as China, shifts in trading by protectionism USA and Brexit
- toename van de belangrijkheid van inkoop binnen organisaties omdat er zoveel extern veranderd en inkoop hier vaak al zicht op heeft en hierop tijdig kan inspelen.
- Inkoop zal (what else is new) aan de voorkant betrokken moeten zijn. Van logge processen naar innoverend inkopen en meebewegen met de ontwikkelingen.
- De productielanden, zoals wij deze nu kennen, zullen verdwijnen. Als dit gebeurd zullen de pioneers de gevestigde orde kunnen doen wankelen.De multinationals van dit moment zullen moeten investeren in innovatie, doen ze dit niet, dan kan het een einde van een tijdperk worden.
- Het van inkoop wordt nog complexer dan het is.
- Vanuit mijn vakgebied Chemie betekent een grotere vraag naar renewable grondstoffen en meer ontwikkeling van groene processen.
- De behoefte aan specifieke producten en diensten zal veranderen en er zal in toenemende mate een beroep worden gedaan op de markt voor innovaties.
- More rules, larger contracts in order to bind everything. More negotiation about the contract details and thinking the other way around because of the lean and green rfp’s and contracts.
- moet zich daarop aanpassen en mogelijk zelfs leidend zijn
- More depending position of european companies of supplier from asia and india
- Less mass production and more specialties (cost improving)More logistics network and costsQuality issuesdifferent cultures-> different behavior
- Procurement is and will be initially a market where offer and demand meet, the question however will be who is offering and who is demanding and what are the basic requirements / conditions to let thow two work together
- Contracten dienen hierop te worden afgestemd.

- Succes of companies will be more dependent of suppliers in terms of technology development, sustainable effort towards there customers and financial revenues. If you are not able to develop a successful supply chain you will decrease in attraction. Procurement will be a inseparable part of the primary processes of companies. Suppliers needs a demonstrable contribution to the strategies of companies.
- There will be a shift for production technologies more towards local production as micahine hours are costing the same and labour cost are also evening out.key issue will be raw material availability and suply chain security.Also CSR will have an impact to be more conscious about the procurement activities and the impact it has on each company's carbon frootprint.next to that each company will also need to start paying attention to diversity and inclusion issues as the workforce scarcity will increase a culatural diversity within international operating companies.
- Connected supply chains will eliminate transactional cost and increase competition
- The importance of environmental and CSR shifting towards Asia. The growth of international trading in combination with increasing Environmental and CSR demands a more focus on controlling suppliers. The growth of Asian Tigers will decrease the CSR quality we have reached so far. In order create an insentive for Asia to invest more in CSR, we need to develop more stable EU standards. Demographic change will make the healthcare cost rise. The quality of our basic healthcare is high. We get cured more and we live longer. This will eventually resolve into more people getting complex, and so, more expensive treatments.
- Procurement needs to adapt their procedures & processes to be able to fullfil the demand of the business (more innovative adaptive/bi modul IT sourcing)
- Need to look for contineous adoptation of changes. Don't copy your strategy from last year.
- De innovatie gaat een belangrijke rol spelen op de producten en diensten
- Mitigation risks will become more important. Not just an execution on paper but concrete actions are needed. Supply chains will change all the time so monitoring those changes will become crucial for procurement.
- Door de verdergaande globalisering en snelheid waarmee innovaties gaan en daarmee de beschikbaarheid van de data steeds eenvoudiger wordt zal de traditionele producttechnisch inhoudelijke inkoop gaan transformeren naar een inkoop met meer algemene kennis op het gebied van juridische, sociaal-economische en politieke aspecten. Dit zou kunnen betekenen dat inkoop steeds meer als een onafhankelijke geconcentreerde dienst aangeboden kan worden en dat de specialismen zich meer demografisch gaan oriënteren in plaats van product- of dienstinhoudelijk.
- The markets will change over the globe.
- More data analytics and traditional procurement jobs shifting towards data and value engineering. More transparance by the blockchain, AI for day to day planned ordering. operational jobs in procurement will dissapear and even tactical roles are under heavy pressure.
- Inkoop zal hierin moeten meebewegen en meegroeien
- Inkopers moeten veel meer dan nu het geval is vanuit een groot macro-economisch en -ecologisch perspectief naar inkoopvraagstukken kijken. Ze moeten veel meer in staat zijn die te vertalen naar hun inkopen van vandaag en morgen.
- The rules of the game are chanching, the war for talent and resources is not automaticly won bij the modern western countries.
- Nog meer focus op internationale ontwikkeling.

- It will make procurement more complicated.
- Minder afhankelijk van landgrenzen, meer afhankelijk van economische machten
- Vanwege de versnelling van innovatie krijg je een kortere productlevencyclus. Daarnaast de steeds mondiger wordende consument/klant eis meer innovatie. Flexibele contractvormen waar meer ruimte zit voor innovaties.
- Politieke druk op aanbestedingswet.
- Inkopen wordt complexer en zal het lokale niveau meer ontstijgen. Protectionisme van overheden zullen niet meer zo relevant zijn.
- World wilde market vs local & it platforms to facilitate. Increase need for sustainable busisness.
- Door de snelheid van innovatie zullen producten / goederen waarschijnlijk een kortere levenscyclus hebben. (eerder vervangen worden)Meestal werkt dit prijsopdrijvend. Productie zal in kleinere oplagen / volumes plaats gaan vinden.
- The focus and the stage will change. Focus: towards integrated management of demand and supplies. Stage: working closely together with marketing/sales and supplu chain management. Driver: the developing (AI, IOT ect) e-procurement suite or better e-commerce suite.
- Gedurende enkele jaren neemt mvo toe daarna is het niet langer vol te houden
- Instability due to political changes, which may cause problems in the supply chainMore customized products may increase complexity in the supply chain and may increase the purchase price
- Trend of more professionalization goes on
- We need to be more aligned with markets in general and with suppliers specifically to be able to keep up with the latest trends and technologies to help us to be/stay best in class when it comes to customer satisfaction with our end user.
- Automation of routine tasks. Broader set of objectives/criteria.
- Inkoop moet veel meer aansluiten op de voorkant van de organisatie, marketing en verkoop.
- That depends wether you operate local or international. Local you have to deal more with environmental and social responsibility and changes in political and macroeconomy. And in international deals you heve to cope withthe shift of economic growth centres and demographic change.
- In hoeverre nog keuze is waar je je producten vandaan haald
- Inkooporganisatie afhankelijk. Verschilt of organisatie bv productie georiënteerd of bv regionaal of mondiaal georiënteerd is. Trends mbt mvo, technologische innovaties en de implicaties hiervan op bv werk en productie zijn voor alle organisaties van grote impact. Inkoop volgt veelal de business.
- Vooral de versnelling van innovatie zorgt ervoor dat er gezocht moet worden naar flexibilisering van voorwaarden en contractvormen. Migratiekosten van een contract beperken.
- Tapping into a hudge unknown pool of suppliers and trading concept s
- marginaal op het niveau van individuele departementen
- Inkoop moet in staat zijn te volgen
- Meer focus op sociale ondernemingen die meer maatschappelijke waarde toevoegen zullen meer als selectie- en gunningscriteria worden meegenomen. Meer geautomatiseerde operationele en tactische processen waardoor soft skills belangrijker worden voor de inkoopfunctie. Meer regie en maken van verbindingen.
- Een verschuiven van Inter(nationaal) naar regionaal.

- internationaal gezien neemt inkoop vanuit Nederland een andere positie in dan voorheen. Innovatie zorgt voor een verschuiving van gevraagde vaardigheden binnen het werkveld. Administratie verdwijnt, vraag naar analytische vaardigheden neemt toe. Maatschappelijk verantwoord inkopen wordt een vanzelfsprekendheid.