2020

Critically evaluate, by means of literature review, how procurement 4.0 can make procurement more ethical.

ABDUL AZEEZ ADIGUN

INTRODUCTION

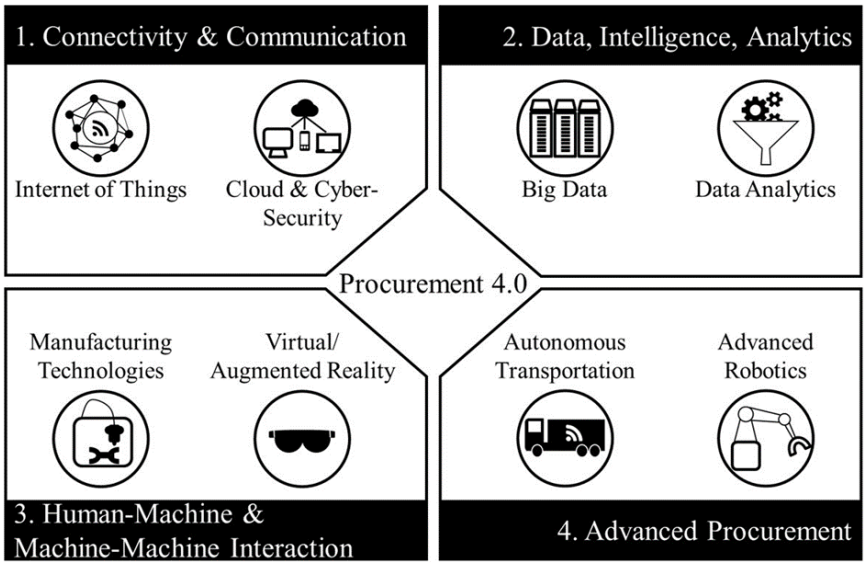
According to Ufberg (2017), ethics is necessary for procuring and it is classified as being a major contributor as much as technology or the change in the behaviour of customers. Acting in accordance with the principles or standards is seen as the appropriate practice and conduct and it is classified as being ethical, particularly with the principles set out by a certain occupation. For example, procurement deals with selecting, evaluating, negotiating, signing off contract and awarding suppliers. Therefore, the function of procurement is to make sure that they act fairly and unbiased towards the supplier (Saini, 2010).

Workers with the responsibility of procuring are obligated to perform their duties at the upmost ethical way, and the inability to follow ethical practices could result in unfair or unethical practices such as, unethical sourcing, collecting bribes and favouritism (Callaghan, 2009). Zorzini et al (2015) discussed that the reaction immediately to an unethical procurement practices would be seen as a bad practice to the members of the public when it becomes a public knowledge. The head of procurement should ensure that the processes are done ethically as it would add to the success of an organisation (Blome and Paulraj, 2013).

In this paper the next section that is section two is going to be discussing procurement 4.0 and the importance of these technologies in procurement. Section three will be discussing the ethical procurement practices and how procurement 4.0 can lead to better ethical procurement. lastly, a suitable conclusion will be drawn in section 4.

2. What is procurement 4.0 and its importance in procurement

As discussed by Wang (2016), procurement can be seen as a unique process that create value which has developed through the industrial revolution. Hence, Firms are connected with their suppliers with procurement 4.0 and this ensures a strong collaboration and coordination within the purchasing process. According to Klünder et al (2019) procurement 4.0 mainly entails four technological areas as indicated with the diagram below.



(Source: Adopted Klünder, Dörseln, and Steven 2019)

The first technological area which is the connectivity and communication. Kovatsch et al., (2012) describe the Internet of things (IOT) to be embedment of different devices from various

participants that has multiple functions into a single network. According to Sanders et al (2016) cloud and cybersecurity is used to manage and store huge quantity of data on a remote server hosted on the internet, open, although it is a protected system so as to enable global asses to the data.

The second technological area which is the data intelligence and analytics, As discussed in the work of Davenport (2012), Big data prove the capability to operate with data as a result of its volume, velocity, variety and its ability to give valuable knowledge for better decision making. The data analytics are business intelligences tools to study patterns with huge amount of data for prediction purposes (Gandomi and Haider, 2015)

For the third area which is the connection of human machine and machine to machine, the virtual reality technology shows further digital details for the workers, and the modern technology used for production that is the 3d printer is used for quick production of prototypes or parts that need to be replaced (Chen, 2016).

Lastly looking at the advance procurement Chen et al. (2014) state that the autonomous transportation is the utilization of automatic conveyance system for delivering products in an efficient manner and improve the efficiency of the driver. The advance robotics enables the capability to do multiple jobs with the absence or slight human involvement (Glas and Kleemann, 2016).

2.1 Importance of these technologies in Procurement

As indicated in the work of Schoenherr and Speier-Pero (2015) a key decision a firm must consider when establishing a purchasing strategy is if they want to make the product inhouse or purchase it from outside source. As a result of the rise in these production technologies like the 3d printing, Firms are now capable of producing prototypes or semi-finished products. The gathering of data and its analytics provides assistance to a firm through laying out and evaluating these data for capable suppliers (Sengupta, 2013). Cegielski and Jones (2016) also state that big data is necessary for planning for the demand, particularly with the analytical tool like the predictive analytics which uses pervious information for the attempt to predict future demand.

According to Kagermann, Wahlster and Helbig, (2013). both the Internet of Things and cloud and cyber security are necessary for evaluating and use to request for offers, the ability to communicate with supplier and having means to shared documents with cell phones is achievable in a suburbanized manner. The device use for processing the material automatically produce these beneficial details then transfer them through the internet of things to the vendors or it will be shared via cloud services (Brettel et al, 2013). In the work of Kolberg and Zühlke (2015), an importance of data analytics is that it is used to evaluate offers because of its capability to compare the accepted offers with one another and also the pervious data.

The internet of things provides an option for decentralized communication which has an effect on how the conditions and negotiated. Because data analytics can be used to evaluate the offer that is being negotiated, a firm could utilize what has been found to develop its advantage when negotiating (Okada, Namatame and Sato, 2015). The quantity of supply agreed upon can be shared via internet of things and attain by every participant through cloud services (Geissbauer, et al, 2016).

The predictive analytics can be used for deciding and planning the quantity to be ordered (Kitchin, 2015). As indicated in the work of Sun and Ryoo (2018), advanced robotics can be used to measure how saved data are been utilized and the number of inventories going out of the warehouse in other to discover the right quantity to be ordered. In addition, the internet of things creates the purchase orders through advance robotics within the storeroom or factory floor. Hofmann and Rüsch (2017) stated that monitoring how the product is been transported is done through sharing of information about the location and condition of the delivery. Through the utilization of the data accumulated of the recent location regarding where to go, the traffic condition and also previously generated data. Data analytics assist with calculating the suitable roads to follow with regards to cost and time. Such as the cost of fuel that would have been used. As indicated in the work of Kearney (2015) immediately a firm receive the sourced product, the workers will be notified, and in a case where inspection is needed, the augmented reality devices such as data glasses could assist the staff by instructing the staff on how to handle and inspect the product.

3. Ethic procurement process

According to Brown, (2009) ethics in procurement could be linked with broad concerns ranging from how the suppliers operate within a business to corruption. Areas such as fair trade, how ethical goods are been sourced, code of conduct, corporate social responsibility are the common ways ethics and ethical behaviours are measured (Ferrel, et al 2012).

In the work of Preuss (2001), procurement is placed with the function of acquiring materials or services that are needed to operate in an organisation. It has currently grown in importance strategically as a result of its responsibility to huge amount of budget. In addition, purchaser are usually the main way in which an organisation link with the external environment, because of that. Buyers are classified as the custodians of the public and interest of the stakeholders (Hoejmose and Adrien-Kirby 2012).

According to Lim and Phillips (2008), due to the fact that they are a lot of things that drives supply chain and business ethics, ethical procurement endeavour in considering the social and ecological impact of procuring. In the work of Arbuthnot (1997) he identifies different processes that were viewed as immoral practices, and the act of misleading suppliers was highly significant. In addition, unethical practices as also being indicated in the work of Carter (2000) to be practices such as collecting bribe, favouritism and deceitful strategies when negotiating. According to Razzaque and Hwee, (2000), giving of gift that was done traditionally is now currently not acceptable and this is because large number of decision makers considered it as an inadvisable action. Although as indicated in lot of studies the purchasing organisation consider the acceptance and gift offering to be a misconduct act, however this might often depend on the worth of the gift. Yet, they are cultural perspective to give gift and the buyer should accept. Hence, clearly distinguishing a Chinese practice to build relationship called Guanxi and bribery should be established (Trawicks and Swan, 1988).

According to Frenkel and Scott (2002), United states during the 90s established the first code of conduct and was well known as Levi Strauss's code of labour practice which follows declaration of sweatshop situations from where the labour and materials are provided from in saipan. The codes got to be well known globally. A report by Tulder et al (2009) indicated that

out of hundred highest organisation, two-third of them apply these codes. Likewise, a lot of organisations in the United Kingdom were highly attentive and established codes to shed more light on their ethical philosophy at that time, for example, the document were given title like operation principle and code of ethics. Arnold (2007) indicated that when outsourcing was introduced within the supply chain, there was a strong necessity for the development of these code of conducts especially in underdeveloped nation because of their lack of governance. Hence, due to the unavailability of a worldwide legislated trading programmes for ethical practices. Optional principles were established by various firm in other to have their own principles to follow (Verma and Seth, 2011). According to Svensson (2009), the utilization of code of conduct will help the organisation and also the supply chain promote consistency in ethical practice, hence, this has made this code of conduct a global tool to manage risk during supply chain operation.

The dedication of a firm to function in a responsibly way by considering the economic and environmental impact and in doing that identify the stakeholder's interest is termed corporate social responsibility (Cavico and Mujtaba 2012). Karagiorgos (2010) stated that the stakeholders are now pressuring organisations to be responsible for what is going on in their supply chain. As indicate in the work of Razafindrambinina and Sabran, (2014) they are four element of corporate social responsibility which are juridical, ethical, economic and humanitarian, and these elements should be totally attended to before a corporate social responsibility plan is regarded to be lawful. The usage of corporate social responsibility enables organisations to gain competitive edge and new opportunities and innovative ways to operate.

Maloni and Brown (2006) indicated that following the well-known case of 'Sweatshop' workers situation amongst suppliers to a popular brands like Nike, Apple and Wal-Mart. Affairs regarding coerced and child labour, the physical state and welfare of the workers, unfairness and payment issues are now a major concern within the supply chain recently. According to Methven O'Brien and Dhanarhajan (2016), the operations of many firms within the supply chain has been discovered to be unethical therefore because of this scrutiny, firms should be conscious of its organisational culture, and how manage the staff's practices. Code of conduct can be employed to prevent being associated with unethical operation during various stages in the supply chain (Garoupa, 2000). Crane, (2013) indicated that the gain derived from codes concerning the environment and society are that they will be improvement in the staffs well being which will result in increase in productiveness and decrease in medical cost, Secondly it will promote long team business survival as a result of its ecological sustainability. According to Brass (2003) human right can be managed with different range of response and this could be in form of apathy to being total concerned. Although, Ignoring and inability to decide in such a circumstance are now view as intolerable. Hence, the elimination of unethical practices like child labour is needed for an organisation to survive.

According to Ruben and Fort (2012) the fair-trade movement has been increasing over the years, especially in the field in which food are being sold. It entails a larger regulatory body whereby the provision of certificate for the business is attained when ethical question relating utilization of the product is addressed. Low and davenport (2005) stated that are various certification to an organisation can show to prove that their goods and materials are sourced sustainably such as the certification forest stewardship council issue concerning sustainable timber items and Rugmark that involve making of rugs and child labour is prohibited. According to blowfield (2004), to trade ethically an organisation should be responsible for the

societal and ecological impact in every stage within its supply chain, particularly within the manufacturing sector, which is highly different from the conventional way. Organisations are now obligated to be responsible for what others do in the supply chain even though over a long period of time it would not cause formal harm because of what they did. Davies and Crane (2003) indicated that the main objective of fair-trade s to empower and improve the society which will be gotten from the supply chain through the application of fair-trade supply agreement. Established institutions such as Fair-Trade Foundation with the UK audits, monitor and enforce the agreement and ensure low cost and condition are regularly attained. Jaffee (2012) stated that fair trade can be seen as an example of ethical practices which as a stabilizing impact on the supply chain and proves that manufacturing and trading can controlled more sustainably

According to Underwood (2016), Bitcoin were on of the first to use the blockchain technology, which can also be use to procure goods today. As sited in the work of O´Leary (2017) Blockchain arrange data in such a way that it enables the creation and sharing of digital journals where every transaction are stored. Blockchain depends on cryptography which makes it possible for everyone using it to include recent details within a secured platform and it does not require a central authority. Pilkington (2016) Indicated that information with the blockchain are impossible to change when it has been stored. According to Chang, Hwang, and Yang (2018) blockchain ledger can now enable the connection of business partners globally and the document of all the transection made and which will be unchangeable. The Blockchain enable the traceability and tracking of product or information and as a result expose any unethical or misconduct practices which create transparency and more ethical supply chain.

As indicated in the work of Tadejko (2015) with internet of things data are gathered and transmitted to different location which enables things such as gadgets, shop floor, warehouse and containers used for shipment therefore makes it capable of being a 'Smart' technology. The internet of a things assists with providing understandable way of using and the health of gadget. Wielki and Janusz (2017) state that to achieve a more ethical procurement, the internet of a thing helps with the notification to replenish inventories and making sure that staffs comply with the organisational code of conduct. The internert of things assist with the selection of capable supplier based on their previous performance therefore the supplier selection is done fairly and transparent and not because of the gift given or bribe given to the staffs.

According to Gress and Kalafsky (2015) with the 3d printing organisation will limit their cost of shipping product due to the fact that the required item can be created within their location, and also it will promote a more sustainable supply chain by reducing the carbon emission that would have been generated from shipment and delivery. The 3d printing also minimizes over production of plastics item, therefore minimizes the generation of waste, which would have contributed to unethical procurement practice.

Conclusion

Overall the study looked at how procurement 4.0 can make procurement more ethical and it was establish through various literature reviewed that procurement 4.0 will promote a more trackable and Transparent sourcing practice within the supply chain, hence unethical practices could be easily seen, and also limit unfair practices, like the selection of underqualified supplier due to bribery. Procurement 4.0 will also help with promoting the reputation of an organisation

through their display of cooperate social responsibility and this will lead to increase in the level of customer loyalty and their revenue.

REFERENCES

Arbuthnot, J.J. (1997) 'Identifying ethical problems confronting small retail buyers during the merchandise buying process', Journal of Business Ethics, Vol. 16, No. 7, pp.745–755.

Arnold, D.F., Bernardi, R.A., Neidermeyer, P.E. and Schmee, J. (2007), ''The effect of country and culture on perceptions of appropriate ethical actions prescribed by codes of conduct: a Western European perspective among accountants'. Journal of Business Ethics, Vol. 70, pp. 327-40.

Blome, C., and Paulraj, A. (2013) 'Ethical climate and purchasing social responsibility: A benevolence focus'. Journal of Business Ethics, 116(3), 567–585.

Blowfield, M. (2004) 'Ethical Supply Chains in the Cocoa, Coffee and Tea Industries', Greenleaf Publishing, pp.1–10.

Brass, T. (2003) 'Why unfree labour is not 'so-called': the fictions of Jairus Banaji'. The Journal of Peasant Studies, 31:1, 101-136

Brettel, M., Friedrichsen, N., Keller, M. and Rosenberg, M., (2014) 'How Virtualization, Decentralization, and Network Building Change the Manufacturing Landscape: An Industry 4.0 Perspective'. International Journal of Mechanical, Aeospace, Industrial, Mechatronic and Manufacturing Engineering, 8(1), pp. 37-44.

Brown, J.L., John, H. Evans, III. and Moser, D.V. (2009) 'Agency theory and participative budgeting experiments', Journal of Management Accounting Research, Vol. 21, No. 1, pp.317–345.

Callaghan, P. (2009) Procurement Ethics. Journal of Purchasing , 28, 233-237.

Carter, C.R. (2000) 'Precursors of unethical behaviour in global supplier management', Journal of Supply Chain Management, Vol. 36, No. 1, pp.45–56.

Cavico, F. J., and Mujtaba, B. G. (2012) 'National and Global Perspectives of Corporate Social Responsibility'. International Journal of Management Sciences and Business Research, 1 (3), 1-24.

Cegielski, C. G., and Jones-Farmer, L. A. (2016) 'Knowledge, skills, and abilities for entry-level business analytics positions: A multi-method study'. Decision Sciences Journal of Innovative Education, 14(1), 91-118.

Chang, P,Y. Hwang, M.-S. and Yang, C.-C. (2018) 'A blockchain-based traceable certification system', Adv. Intell. Syst. Comput., vol. 733, pp. 363–369

Chen, H., Chiang, R.H. and Storey, V.C., (2012) 'Business intelligence and analytics: from big data to big impact'. MIS quarterly, pp.1165-1188.

Chen, Z. (2016) Research on the Impact of 3D Printing on the International Supply Chain, Advances in Materials Science and Engineering, vol. 2016.

Crane, A. (2013) 'Modern slavery as a management practice: exploring the conditions and capabilities for human exploitation'. Academy of Management Review, 38/1: 45-69.

Davenport, T.H., (2012) ‘The human side of Big Data and high-performance analytics’. International Institute for Analytics, pp.1–13.

Davies, I.A. and Crane, A. (2003) ‘Ethical decision making in fair trade companies’, Journal of Business Ethics, Vol. 45, Nos. 1/2, pp.79–92.

Ferrel, O.C., Freedrich, J. and Ferrel, L. (2012) Business Ethics: Ethical Decision Making and Cases, South Western.

Frenkel, S.J. and Scott, D. (2002) ‘Compliance, collaboration, and codes of labour practice: the Adidas connection’, California Management Review, Vol. 45, No. 1, pp.29–49.

Gandomi, A. and Haider, M., (2015) ‘Beyond the hype: Big data concepts, methods, and analytics’. International Journal of Information Management, 35(2), pp.137-144.

Garoupa, N. (2000) ‘The economics of organized crime and optimal law enforcement’. Economic Inquiry, 38(2), 278-288.

Geissbauer, R., Weissbarth, R. and Wetzstein, J., (2016) Procurement 4.0 - Are you ready for the digital revolution, Düsseldorf/Munich: PwC.

Glas, A. H., and Kleemann, F. C (2016) ‘The impact of industry 4.0 on procurement and supply management: a conceptual and qualitative analysis’. International Journal of Business and Management Invention, 6(5), 55-66.

Gobble, M. M. (2013) ‘Big Data: The Next Big Thing in Innovation. Research Technology Management’. 56(1): 64-66.

Gress, D,R. and Kalafsky, R,V. (2015) 'Geographies of production in 3D: Theoretical and research implications stemming from additive manufacturing', Geoforum, Vol. 60, pp. 43-52.

Hoejmose, S. U., and Adrien-Kirby, A. J. (2012) ‘Socially and environmentally responsible procurement: A literature review and future research agenda of a managerial issue in the 21st century’. Journal of Purchasing and Supply Management, 18(4), 232–242.

Hofmann, E. and Rüsch, M.(2017) ‘Industry 4.0 and the current status as well as future prospects on logistics’. Computers in Industry, 89, 23–34.

Jaffee, D. (2012) ‘Weak Coffee: Certification and Co-Optation in the Fair Trade Movement’. Social Problems, 59(1), 94–116.

Kagermann, H., Wahlster, W., and Helbig, J. (2013) ‘Recommendations for implementing the strategic initiative Industrie 4.0 Final report of the Industrie 4.0 Working Group’. Communication Promoters Group of the Industry-Science Research

Karagiorgos, T. (2010) ‘Corporate Social Responsibility and Financial Performance: An Empirical Analysis on Greek Companies’. European Research Studies, 13 (4), 85-108.

Kitchin R (2015) ‘The opportunities, challenges and risks of big data for official statistics’. Statistical Journal of the International Association of Official Statistics 31(3): 471–481.

Klünder,T. Dörseln,J,N and Steven, M (2019) Procurement 4.0: How the digital disruption supports cost-reduction in Procurement

Kolberg, D., and Zühlke, D. (2015) 'Lean automation enabled by industry 4.0 technologies'. IFAC-PapersOnLine, 48(3), 1870-1875.

Kovatsch, M., Mayer, S., and Ostermaier, B. (2012) 'Moving application logic from the firmware to the cloud'. In Proceedings of the 6th International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (IMIS) (pp. 751-756). Washington: IEEE Computer Society.

Lim, S., and Phillips, J. (2008) 'Embedding CSR values: The global footwear industry's evolving governance structure'. Journal of Business Ethics, 81(1), 143–156.

Low, W. and Davenport, E. (2005) 'Has the medium (roast) become the message? The ethics of marketing fair trade in the mainstream', International Marketing Review, Vol. 22, No. 5, pp.494-511.

Maloni, M.J. and Brown, M.E. (2006) 'Corporate social responsibility in the supply chain: an application in the food industry', Journal of Business Ethics, Vol. 68, No. 1, pp.35–52.

Methven O'Brien, C., and Dhanarhajan, S. (2016) 'The corporate responsibility to respect human rights'. A status review. Accounting, Auditing and Accountability Journal,29(4),542–567.

O´Leary, D.E. (2017), 'Configuring blockchain architectures for transaction information in blockchain consortiums: the case of accounting and supply chain systems'. Intelligent Systems In Accounting, Finance & Management, Vol.24 No.4, pp.138-147.

Okada, T., Namatame, A. and Sato, N. (2015) 'An agent-based model of smart supply chain networks Intelligent and EvolutionarySystems.

Pilkington, M. (2016) 'Blockchain Technology: Principles and Applications. In: Research Handbook on Digital Transformations'. Ed. by F. X. Olleros and M. Zhegu. Edward Elgar Publishing, pp. 1–39.

Preuss, L. (2001) 'In dirty chains? Purchasing and greener manufacturing', Journal of Business Ethics, Vol. 34, Nos. 3/4, pp.345–359.

Razafindrambinina, D., and Sabran, A. (2014) 'The Impact of Strategic Corporate Social Responsibility on Operating Performance: An Investigation Using Data Envelopment Analysis in Indonesia'. Journal of Business Studies Quarterly, 6 (1), 68-78.

Razzaque, M.A. and Hwee, T.P. (2002) 'Ethics and purchasing dilemma: a Singaporean view', Journal of Business Ethics, Vol. 35, No. 4, pp.307–326.

Ruben, R., and Fort, R. (2012) 'The Impact of Fair Trade Certification for Coffee Farmers in Peru'. World Development, 40(3), 570–582.

Saini, A. (2010) 'Purchasing Ethics and Inter-Organizational Buyer Supplier Relational Determinants: A Conceptual Framework'. Journal of Business Ethics 95(3), 439–455.

Sanders, A., Elangewaran, C. and Wulfsberg, J., (2016) Industry 4.0 Implies Lean Manufacturing: Research Activities in Industry 4.0 Function as Enablers for Lean Manufacturing. Journal of Industrial Engineering and Management, 9(3), pp. 811-833.

Schoenherr, T. and Speier-Pero, C., (2015) ‘Data science, predictive analytics, and big data in supply chain management: Current state and future potential’. Journal of Business Logistics, 36(1), pp.120-132.

Sengupta, S. (2013) ‘10 trends in supply chain management’, Supply Chain Management Review, Vol. 17 No. 4, pp. 34-39.

Sun, K. and Ryoo, I. (2018) ‘A Smart Sensor Data Transmission Technique for Logistics and Intelligent Transportation Systems’. Informatics, 5, 15–35.

Svensson, G. (2009). The transparency of SCM ethics: conceptual framework and empirical illustrations. Supply Chain Management: An International Journal, 14(4), 259 – 269.

Tadejko, P. (2015) ‘Application of Internet of Things in Logistics–Current Challenges’. Economics and Management 7 (4): 54–64.

Trawick, I.F. and Swan, J.E. (1988) ‘How salespeople err with purchasers: overstepping the ethical bounds’, The Journal of Business and Industrial Marketing, Vol. 3, No. 2, pp.5–11.

Tulder, R., Wijk, J. and Kolk, A. (2009) ‘From chain liability to chain responsibility’, Journal of Business Ethics, Supplement 2, Vol. 85, Supplement 2, pp.399–412.

Ufberg, D. D. (2017) ‘Business ethics in the age of robotics lecture features Wharton business professor’. Miami Law News Articles

Underwood, S. (2016), ‘Blockchain beyond bitcoin’, Communications of The ACM, Vol.59 No.11, pp.15-17.

Verma, A. and Seth, N. (2011). A Conceptual Framework for Supply Chain Competitiveness. International Journal of Human and Social Sciences, 6(1), 5-10.

Wang, S., Wan, J., Li, D. and Zhang, C., (2016) ‘Implementing Smart Factory of Industrie 4.0: An Outlook’. International Journal of Distributioed Sensor Networks, pp. 1-10.

Wielki, and Janusz. (2017) ‘The Impact of The Internet of Things Concept Development on Changes in The Operations of Modern Enterprises’. Polish Journal of Management Studies 15: 262–75.

Zorzini, M., Hendry, L. C., Huq, F. A., and Stevenson, M. (2015) ‘Socially responsible sourcing: Reviewing the literature and its use of theory’. International Journal of Operations & Production Management, 35(1), 60–109.