An Analysis of the Value of Data Ecosystem Tools for Industry 4.0

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ABSTRACT

Product design is a process that involves many methods and practices to be able to create “good design.” From user studies to experimentation, the designer has many tools at his disposal to understand the market and the requirements of the product they wish to produce. Big data has been a disruptor in user analysis for many organizations wishing to get the bigger picture. It has proven to have many positive implications while also being restrictive to those willing to use it. Therefore, connected open systems where all strata are able to access similar applications have been made available. With the 4th industrial revolution underway, and the ability to utilise a plethora of sensors and electronic data provided by internet connected devices, is it in the designer’s interest to adopt modern data practices? During this research, the suitability of big data practices to designers was assessed to gain an understanding of the environment that would allow designers to utilise this new platform including the practice of open data and the systems required to manage it. This article will address emerging and current technologies in the use of data within the 4th industrial revolution. Big data and open data were critically examined of their processes and downfalls compared to how the designer would use the practices.

KEYWORDS

Big Data, Data Ecosystems, Industrial Revolution, Industry 4.0

1. INTRODUCTION

“…Expanding our ability to perceive the world” – Aaron Koblin (Creative Director – Google) (The face of Human Data, 2016).

Big data in a technical sense is defined by the three V’s, volume, velocity and variety. The definition that describes it highlights both its advantages and its restrictions. The nature of big data has been a direct resultant of a world connected by electronic devices and digital product services, high speed networks such as the internet can provide large Volumes of data every hour while also being analysed and categorized by analytic and machine learning systems. With the input not just limited to yes/no questions, the new data collection systems can instead facilitate complex and specific queries (Landset et al., 2015). This research will attempt to assess the technical feasibility of integration into product design as well as just its tangible applications.

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In a broader sense, big data is the emerging technology that allows companies to make decisions based on a variety of data. The 4th industrial revolution encompasses a development in technologies since the 19th century where industrial equipment harnessing the new technologies of steam, to the 21st century where new emerging technologies in the form of digitization of information, to bring knowledge of the physical and biological as the new industrial commodity of wealth (Skilton and Hovsepian, 2018). During the first industrial revolution the Jenny cotton mill was an invention of a poor illiterate who wanted to improve productivity and working conditions. It was cheaper than its competitor the mul.e and was adopted by those with limited capital (Allen, 2009). Had this sentiment and idea of an industrial revolution repeated itself into the 4th industrial revolution or had the industrial complex taken a monopoly over out data? Themes of accessibility and usability were discussed.

Data is allowing the 4th industrial revolution to expand and diversify, while even becoming smarter and more intuitive the more data is collected. The connected nature of the data has also brought the new technology to reaches of the earth which previously did not have the reach (The face of human data, 2016). This flow of shared data and open services are allowing industries to harvest new data and expand deeply on human nature. Has the value of quantitative data increased to be able to give an understanding that equals that of qualitative?

There were many forms of data available for different forms of research, the least explored by product design were open data and big data. As their use was limited to certain organizations and still in a developmental stage of its life cycle, the author felt it would be necessary to highlight the two emerging data resources in the context of design.

Through the research, the question was asked as to what environment or scenario a big data opportunity would thrive in. This led to discussions on the relevance of the nature of data and what was within reach of designers. Big data by nature is the agreement of the sharing of data between parties for a market edge or gain, used by companies to exploit unseen or previously unavailable insight. This current state of data collection and analysis may not have the correct premises to apply to the product design industry. Therefore, the ideas of open data and data sharing were used in the research to give a future perspective on the subject of Big Data and how we communicate with each other. Through this research, the aim was to criticise and question the validity of prescribing the practices of big data to that of the designer. In order to achieve this aim, following objectives were set:

- To gain a thorough understanding of the components of big data and how it is currently used in a wider context;
- To expand on the future uses and nature of data and how its landscape is changing to accommodate designers;
- Understand why designers are using or not using data and what their take on the use of data in design is;
- Gather professional opinions on what the nature of big data and open data is in the current environment;
- Specify the current and future criteria required to allow a designer to use quantitative data.

2. LITERATURE REVIEW

Big data was the relatively new way of conducting business by providing new insight. Could big data be the new resource for designers? An inside investigation into the workings and pitfalls were discussed below. The two types of uses were categorized into either user facing or business facing. The business facing applications tended to provide system infrastructure and details analytics to either streamline internal practices or improve business decision making. The user facing tends to the notion that the data gathered from users helps a larger system. This system can then provide tailored products. On some occasions the two can combine to provide a value for using certain schemes. An example of
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For All of Our Languages We are Not Natives Here: Challenging the Idea of the Digital Native, Rethinking the Digital Divide
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