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The Fourth Industrial Revolution: an initial investigation into the marketing opportunities and challenges for entrepreneurs.

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Abstract:

The Fourth Industrial Revolution (Schwab 2016) will present an innumerable amount of opportunities and challenges to a range of entrepreneurs. The 23-shifts identified within the Fourth Industrial Revolution (Schwab 2016) will have four major impacts on entrepreneurs' businesses and their future marketing. Customer expectations, data enhanced products, collaborative innovation and new operating models will undoubtedly influence the business decisions and marketing of all entrepreneurs. 9 different types of entrepreneurs (Open University 2017) were interviewed. Their predictions and opinions were captured and analysed in relation to the Fourth Industrial Revolution. This initial investigation ends with a succinct summary of potential areas for further development, reasoning and research.

Introduction

The Fourth Industrial Revolution (Schwab 2016) promises to deliver a range of opportunities and challenges for entrepreneurs and marketing. It will inevitably merge the digital, physical and biological worlds. Whilst it is unchallengeable that digital technology has transformed our current world, it now forms part of a fading third revolution which is looking relatively mundane (Greg 2018). This paper aims to investigate the initial opportunities and challenges for marketing and entrepreneurship posed by the Fourth Industrial Revolution. The paper explores the nature of an industrial revolution and examines the Fourth Industrial Revolution (Schwab 2016) as a source of new opportunities and challenges for entrepreneurs and how they will exploit the four impacts and 23 deep shifts as a source of innovation and ultimately business success. It proceeds to investigate government perspectives and corporate strategy perspectives. It highlights common themes between the contemporary academic position of marketing as a Transformative approach (Kumar 2018) and the Fourth Industrial Revolution (Schwab 2016).

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The paper presents the findings of a research project which had the purpose of investigating the marketing opportunities and challenges created by the Fourth Industrial Revolution, which might be implemented for marketing purposes by entrepreneurs. 9 entrepreneurs were interviewed as part of this initial investigation based up type of entrepreneur. More specifically, it focused upon the relationship between 'entrepreneurs and marketing.' The opportunities and challenges of the 23 deep shifts are explored with entrepreneurs in relation to marketing in the future.

What constitutes an industrial revolution anyway?

Whilst this paper considers The Fourth Industrial Revolution, there is a recognition that there is no common and popular agreement to what constitutes an industrial revolution (Maynard 2015). Liao et al (2017) consider industrial revolutions from the technical perspective, and identify four stages, the first three taking place over a couple of hundred years which are the results of firstly, the introduction of water and steam-powered mechanical manufacturing facilities, secondly, the application of electrically-powered mass production technologies through the division of labour, and thirdly the use of electronics and (IT) to support further automation of manufacturing (Liao et al 2017).

The Fourth Industrial Revolution (Schwab et al 2016) is the focus of this research project. Indeed, there is some scope to compare and contrast how the Fourth Industrial Revolution will manifest itself in the future and its impact upon all aspects of business, economics and society. There are a number of other similar terms used to categorise the 'next' industrial revolution. Liao et al (2017) take a technology-based perspective and contextualise their perspective as Industry 4.0. In fact the term Fourth Industrial Revolution was used to indicate the development and application of nanotechnologies (Parathasarathi and Thilagavathi 2011), which of course is a quite different context to that of Schwab (2016). The term seems to have been integrated into an even more technological focus as it was used to include the technological integration of Cyber Physical Systems (CPS) into manufacturing, and the Internet of Things (IOT) (Liao et al 2017). However, Schwab's definition (2016) extends the context of the definition to include 23 Shifts in technology, which are developed to include much more than technology, but arguably and more importantly - that this technological change will be the driver of innovation which will in itself be a catalyst for wider change in business, societies, economies, cultures and our own personal lives.

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What is the Fourth Industrial Revolution?

The Fourth Industrial Revolution is a term created by Schwab (2016) and is the essence of his view that technological innovation will drive tremendous change everywhere. The term 'everywhere' is important because it represents huge changes in technology which are not bound by geography. The first industrial revolution took place in specific economies, and it happened gradually over time (Rostow 1962). It was bound by the geographical border of nations. The first industrial revolution did not take place simultaneously. It is generally accepted that it began in Great Britain in 1783, although it expanded in pockets in different nations at different times. The industrial revolution began in China as late as 1952 (Rostow 1962).

Country	Take-off Period
Great Britain	1783-1802
Russia	1890-1914
United States	1843-1860
Germany	1850-1873
Canada	1896-1914
China	1952
India	1952
Rostow's Stages of Growth (1962)	

The Fourth Industrial Revolution will take place globally, and will inevitably centre upon those nations which are through the Third Industrial Revolution. The Fourth Industrial Revolution captures the enormous scale and scope of future change, driven by disruption (Christensen et al 2018) and innovation (Bessant and Tidd 2011, Drucker 1985). Forecasted megatrends and technological changes are predicted to impact our businesses, societies, economies, cultures and personal lives forever.

The Fourth Industrial Revolution - Government Perspectives

There are a large number of Government plans and projects in place in readiness for the Fourth Industrial Revolution (Parthaarathi and Thilagavathi 2001). They tend to be medium-long term in relation to their time horizons, are supported by billion Dollar investments, and form fundamental foundations of Governments' business and industry policies.

- The United States implemented the Advanced Manufacturing Partnership (AMP) which was a series of national discussions which delivered recommendations so that the US could plan to be the leader of the next generation of manufacturing (Rafael et al 2014).

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- The German government implemented the High-Tech Strategy 2020, which commits billions of Euros for the development of new and innovative technologies (Kagermann et al 2013).
- Likewise the French government initiated La Nouveille France Industrielle' in 2013, which saw the prioritisation of 34 sector-based initiatives as the focus of France's industrial strategy (Conseil national de L'industrie 2013)
- In the United Kingdom (UK) the government championed a long-term manufacturing strategy called the Future of Manufacturing. It encompasses a strategy to make the UK industrial sectors more resilient with a focus on 2050 (Foresight 2013)
- The European Commission has its own Public-Private Partnership embodied within Factories of the Future (FOF). Under the Horizon project, 80 billion Euros will be made available to new initiatives.

The Fourth Industrial Revolution - Corporate Strategy Perspective

Again, large global businesses are embracing the Fourth Industrial Revolution to develop technologies to drive innovative products, services and solutions of the future. Some global businesses have formed consortia to spread the risk and cost of innovations, and to exploit core competences. Others have invested heavily in CPS and the Internet of Things, as individual competing businesses.

Company	Strategy
AT&T / Cisco / General Electric / IBM / Intel	Industrial Internet Consortium (IIC) 2014 (Evans and Annunziata 2012)
Siemens / Hitachi / Bosch / Panasonic / Honeywell / Mitsubishi / ABB / Schneider Electric / Emerson Electric	Invested Heavily in CPS and IoT
Summary of Industrial Plans Perspective, adapted from Liao et al 2017	

The Fourth Industrial Revolution - Marketing Entrepreneurs' Perspective

The Fourth Industrial Revolution will influence business, societies, economies, cultures and our personal lives. Of course, this will be fertile ground for entrepreneurs. It will provide opportunities and challenges for marketing in all of its current and future forms. This research project will evaluate the challenges and

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opportunities for entrepreneurs as they plan and implement marketing activities in the future.

What marketing opportunities and challenges face entrepreneurs?

Contemporary marketing thinking is informed by the concept of Transformative Marketing (Kumar, 2018). Transformative Marketing recognises the ongoing changes among consumers, markets, and marketing departments and their influence on the need for business transformations. Naturally many entrepreneurs will not be part of a marketing function as such, and entrepreneurs will have differing levels of marketing experience, or access to marketing collaborators (Masouras, 2019). However, Kumar (2018) advocates a framework based upon a series of forces, namely technology, environmental resources, economic forces, customer preferences, Government regulations, and finally competitive forces. The Kumar (2018) paper on Transformative Marketing has common themes with Schwab's Fourth Industrial Revolution, and makes tangible connections between the academic and professional discipline marketing, and the predictions made by Schwab (2016).

Transformative Marketing (Kumar 2018)	**Fourth Industrial Revolution (Schwab 2016)**
Technology	Shifts 1-23
Environmental resources	Box B: Environmental Renewal and Preservation
Economic forces	Economy. Growth/Employment/Nature of Work.
Customer preferences	*Customer expectations* have a major impact.
Government regulations	National and Global. Governments.
Competitive forces	Megatrends. Physical/digital/biological.
Connecting the key themes (Kumar 2018, and Schwab 2016)	

Entrepreneurs as the drivers of the Fourth Industrial Revolution.

Entrepreneurs have already had a huge impact upon the drivers of the Fourth Industrial Revolution. One might recall the increasing number of new and established brands which have disrupted industries over recent years such as Uber, Airbnb, Spotify, and Tesla and others. Entrepreneurs will innovate products and services delivered by the Fourth Industrial Revolution. Physical examples might include autonomous vehicles, 3D printing, advanced robotics, and new materials.

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The Internet of Things (IoT) has been one of the early foundations and other digital technologies will develop over the coming years, such a Bitcoin and Block Chain, amongst others. Biological innovations will deliver, amongst other technologies, synthetic biology whereby the DNA of organisms can be custom written. Many future technologies and their applications are unforeseeable. However, how will they influence, or be influenced by, marketing and entrepreneurship? Artificially intelligent assistants such as Siri and Amazon's Alexa will become the avenues through which people consume products and services and there will be a battle to control and influence consumers using AI assistants by marketers (Niraj and Neil 2018).Marketing thinking is changing to reflect the future, and concepts such as Transformative Marketing (Kumar 2018) are reflecting these views and attitudes, as the subject adapts and becomes future-oriented.

In a global sense, there is predicted to be a deep shift (Schwab 2016) in the way that transformations captured by the Fourth Industrial Revolution are going to manifest themselves. The table below summarises the 23 key shifts as espoused by the World Economic Forum (WEF).

SHIFT	TECHNOLOGY
Shift 1	Implantable technologies
Shift 2	Our digital presence
Shift 3	Vision as the new interface
Shift 4	The wearable Internet
Shift 5	Ubiquitous computing
Shift 6	A supercomputer in your pocket
Shift 7	Storage for all
Shift 8	The Internet of Things (IOT)
Shift 9	The connected home
Shift 10	Smart cities
Shift 11	Big data for decisions
Shift 12	Driverless cars
Shift 13	Artificial Intelligence (AI) and decision-making
Shift 14	AI and white-collar jobs
Shift 15	Robotics and services
Shift 16	Bitcoin and the Blockchain
Shift 17	The sharing economy
Shift 18	Governments and the Blockchain
Shift 19	3D Printing and manufacturing

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Shift 20	3D Printing and human health
Shift 21	3D Printing and consumer products
Shift 22	Designer beings
Shift 23	Neurotechnologies

Summary of the 23 Shifts (WEF 2015)

How will the 23-shifts influence entrepreneurs?

Schwab (2016) anticipates that there will be four major impacts upon businesses in the future. The impacts will affect businesses across industries. These are customer expectations, data-enhanced products, collaborative innovation and new operating models. They are considered in greater depth as follows.

a. Entrepreneurs, marketing and customer expectations

Market-oriented businesses have the customer as the central focus of marketing activities (Naver and Slater 1990, Kolhi and Jowarski 1990). Marketing and customer experiences are central to digital customer experiences, and it is the 'experience' of the customer which is central to entrepreneurial and marketing opportunities and challenges in the future. Whilst traditional forms of segmentation are becoming replaced by digital metrics and analytics, entrepreneurs might take advantage of opportunities to share data, in a legal and ethical ways – of course. In fact the nature of market-orientation itself might be measured using real-time analytics data. Analytics data drives real-time business and marketing decisions. Schwab (2016) emphasises the importance of the 'now world' demanded by Millennials (and indeed Generation Z), and these new customer expectations provide opportunities and challenges for entrepreneurs, and how they market.

b. Entrepreneurship, marketing and data-enhanced products

Digital technologies are providing new ways for businesses to add value to their products and services. In turn there are new opportunities for entrepreneurs to develop and even disrupt the offerings of current brands by providing innovative alternatives. For example, asset performance provides its own data and analytics in real-time which supply the basis for new products and ways of doing business (Schwab 2019). Examples of new technologies are already accepted in industries such as aviation, but what opportunities might less obvious industries and sectors offer?

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c. Entrepreneurship, marketing and collaborative innovation

New forms of collaboration are being devised to take advantage of opportunities provided by customer experiences and analytics data (Schwab 2016). This is largely because of the speed at which new forms of innovation and disruption occur. Arguably collaboration delivers value for both parties (Read, Sarasvathy et al 2016). Established incumbents may be slower to react, whilst newer start-ups might struggle with lack of legitimacy, when raising finance for example. Studies of entrepreneurial networks have existed since the 1960, although not precisely the same as collaboration, they offer some insight into how new forms of collaboration might evolve. This is especially the case when using networks to create new ties, develop existing ties and reviewing and pruning existing ties (Blundel 2002).

d. Entrepreneurship, marketing and new operating models

New business models will be fundamental to economic and social success. Global platforms connected to the physical world will underpin business success. For example, Netflix offers a service whereby customers experience movies and TV from anywhere, when it is convenient for individual customers. Customers do not own DVDs or records. This in itself provides opportunities for entrepreneurs to explore ownership per se, so companies do not market products, they market their platforms and how the service is delivered. The huge amount of new, real-time customer data will in itself provide opportunities but also challenges in relation to new cyber-and-data security threats. New skills will be needed to exploit the new openings, and will mean changes in the human resources markets.

Challenges and opportunities

Naturally, there will be a number of challenges and opportunities presented by the Fourth Industrial Revolution (FIR). This research investigation cannot possibly investigate them all. Nevertheless, it can explore in more detail some of the key issues identified by Schwab (2016) which inevitably will impact upon entrepreneurs and marketing.

Research Methods

What is the purpose of this research project?

The aims of this research investigation are firmly based upon key issues for entrepreneurs across a number of sectors and industries (Schwab 2016) and the 23 shifts advocated by the World Economic

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Forum (2015). The entrepreneurs were selected based upon the 9 distinct types of entrepreneur identified and summarised in the table below (Open University 2019). Each type of entrepreneur was interviewed using a semi-structured research interview, and qualitative data was analysed using a thematic analysis (Braun and Clarke 2006). This allowed for the researcher to develop codes from the data. For this initial investigation, it allowed flexibility so that a diverse range of theories might be considered as arising from the dataset. Additionally, the investigation was underpinned by typologies (Schwab 2016) and so the focus was in identifying themes based upon a series of associated prompts. This provided some basic continuity across datasets. Conversely, the small sample size and the variety of entrepreneurial types might mean that that nuances might be missed, the variety of findings and voices makes it difficult to identify specific issues to follow during interviews. All respondents were asked to watch a brief World Economic Forum (WEF) video which summarised the Fourth Industrial Revolution

Type of entrepreneur	Total of entrepreneurs n=9	Interviewed
Intrapreneur	1	✓
E-preneur	1	✓
Ecopreneur	1	✓
Lifestyle entrepreneur	1	✓
Portfolio entrepreneur	1	✓
Rural entrepreneur	1	✓
Serial entrepreneur	1	✓
Social entrepreneur	1	✓
Technology entrepreneur	1	✓
Types of Entrepreneur (Open University 2019)		

They are honed and focused to reflect the views of a small sample of British entrepreneurs, mainly from Hampshire and West Sussex, situated on the south coast of the United Kingdom. 9 semi-structured research interviews were conducted with experienced and successful local entrepreneurs from a variety of contexts (Zahara, S.A., Wright, M. and Abdelgawad, S.G. 2014) and industries. Semi-structured interviews were based upon 2 key objectives, which in themselves were founded upon the Fourth Industrial Revolution discussed earlier in this paper.

Objective One

To examine the four main effects of the Fourth Industrial Revolution upon entrepreneurs and marketing.

From Schwab (2016), there are four main effects on businesses across industries which pose a series of questions. They are adapted to reflect the challenges and opportunities for marketing and entrepreneurship within a local context, as follows:

a. How will customer expectations change the actions of entrepreneurs?

b. How will Big Data improve the productivity and effectiveness of marketing by entrepreneurs?

c. What forms of (marketing) collaboration and (marketing) key partnerships will be formed by entrepreneurs?

d. How will digitalization change marketing's role in entrepreneurial business models?

Objective Two

To scrutinise the influence of the 23 shifts on entrepreneurs and marketing.

a. How and in what ways will the 23 shifts influence your future decisions?

b. How and in what ways will the 23 shifts affect your marketing?

Summary of key findings

As a result of conducting nine semi structured research interviews, there is a plethora of useful data. Using a basic thematic analysis key issues are reviewed below. Each objective is recorded next to the question posed. In the next row is a brief summary of what the researcher identified as the key theme. In the final row at the bottom of the table, are examples of two quotations from different respondents. Each example was selected by the researcher and any unconscious bias is recognized. Nevertheless, the themes depict their own narrative, and offer some insight into the views of the 9 entrepreneurs interviewed.

Objective 1a	Q1. How will *customer expectations* change the potential actions of entrepreneurs?
Summary: **All entrepreneurs saw customers and their expectations as being central their application of the 23**	

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shifts.
Example Quotation: *As an entrepreneur, I see meeting customer expectations as the main focus of all of our business enterprises* (Portfolio entrepreneur) *Internal and external customers are fundamental to all decisions* (Intrapreneur)

All 9 interviewees anticipated that there would be a customer driven need for entrepreneurs to adapt their business strategy and their marketing approaches. Market-orientation seemed to be fundamental to all entrepreneurs, and they anticipated that the use of different technologies would drive new initiatives in the way in which they innovated their own businesses, and employed digital technologies as the basis of all aspects of market orientation, and more to notably marketing in action. Interestingly, few entrepreneurs were specific in terms of what would happen in the future. Some generalised about the use of virtual reality and artificial intelligence as the basis of new customer experiences. The specifics of what the customer might need in the future, and how any or all of the 23 shifts would meet these needs, is a topic for further investigation.

Objective 1b	Q2. How will *Big Data* improve [ANALYTICS DATA/REAL-TIME] the productivity and effectiveness of all marketing strategies by entrepreneurs?
Summary: **Those best equipped to collect customer analytics saw the benefits of Big Data to the effectiveness of their marketing strategies. Smaller business less so.**	
Example Quotation: We are small, and we know our customers as individuals. Analytics is on a small scale, if at all (Lifestyle entrepreneur) Data collection and analytics is vital to all of our operations. (Portfolio entrepreneur)	

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Of course, any question relating to Big Data is open to a huge variety of potential responses. Since the 9 entrepreneurs would work in such diverse industries and contexts, and indeed they in themselves are different types of entrepreneur, no single succinct summary can encapsulate all responses. Nevertheless, there is a clear distinction between those entrepreneurs with businesses which are better equipped to process large amounts of analytical data and those who were not so. Those that were in a position to capture analytics intended to use them to innovate and to deliver marketing activities. Smaller business owners tended not to see the bigger picture in relation to analytics, and explained that they would use new opportunities for data collection to improve their customer relationships, at the customer interface. There is a challenge to investigate how entrepreneurs would use the big data delivered by the 23 shifts, both as a way to improve marketing and innovation, but also to improve long-term customer relationships.

Objective 1c	Q3. What forms of (marketing) *collaboration* and (marketing) *key partnerships* will be formed by entrepreneurs?
Summary: Collaborations and partnerships to exploit the 23 shifts was seen as important by almost all of the interviewees.	
Example Quotation: We will look for collaborations, and network persistently. We see partnerships as a fundamental strategy (Technology entrepreneur) We always worked with our friends and neighbours, and so partnerships and sharing will be familiar to us (Rural entrepreneur)	

Collaboration will see entrepreneurs working with others to complete tasks. Generally, collaborators bring skills, experience and resources to innovation (Read, Sarasvathy et al 2016), and so it is a concept with which entrepreneurs are familiar. Almost all respondents considered collaboration on the 23 shifts as important. This is an intriguing answer since the breadth and variety of shifts means that

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entrepreneurs will want to work with others in order to adopt the new technologies. This means that there will be opportunities for new ventures. This is an area for further development.

Objective 1d	Q4. How will *digitalization change* marketing's role in entrepreneurial business models?
Summary: Here there was some disagreement. Some saw the opportunities for new digital marketing business models as being central, whilst others saw them as being integrated into current marketing processes.	
Example Quotation: There will be new types of digital marketing businesses to take advantage of some of the 23 shifts. Roles will change substantially. (Serial entrepreneur) Whatever new digital marketing approaches come along, we'll take a look at them. (Social entrepreneur)	

Today, many digital technologies have already been adopted by most of those entrepreneurs interviewed. Whilst all are familiar with digital technologies, there was disagreement in relation to the level and nature of marketing and how digitalization would impact upon strategy. On the one hand some saw the opportunities for new digital business models as being central to the future of marketing and digitalization. Others considered that new digital technologies would be integrated into current approaches. Is some ways, both responses have some value. The specific nature of digitalization and the 23 shifts might be considered in greater depth.

Objective 2a	Q1. How and in what ways will the 23 shifts influence your future decisions?
Summary: All respondents agreed that the 23 shifts would influence business decision making in one way or another. Some saw them as fundamental drivers of strategy, whilst others saw them as drivers – to a greater or lesser extent.	
Example Quotation: The 23 shifts will provide opportunities for innovation and a better life for our clients (Social entrepreneur). Now that I am more familiar with the 23 shifts, I will include them in all of my future decisions (E-	

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preneur)

The final questions relate to objective 2. Objective 2 provides the entrepreneur with an opportunity to explore his or her own vision of the future in relation to the 23 shifts and how they might influence entrepreneurial decision-making. Secondly entrepreneurs were asked to consider the influence of the 23-shifts on their entrepreneurial marketing. These a broader question areas. All of the entrepreneurs interviewed agreed that the 23 shifts would influence their decision making. Some of the entrepreneurs saw the 23 shifts as fundamental drivers of their future businesses. Others saw them as influences or drivers to a greater or lesser extent. Therefore, it is fair to say that some entrepreneurs saw them as more important than others.

Objective 2b	Q2. How and in what ways will the 23 shifts affect your marketing?
Summary: Respondents did not have a consistent view of how the 23 shifts would affect marketing. There was some basic evidence of innovation in their comments.	
Example Quotation: Marketing will be influenced by the 23 shifts. However, precisely how is not simple to predict (Portfolio entrepreneur). Yes, we will use some of the 23 shifts for future marketing activities, but I cannot tell you how exactly. This is where innovation will happen (Technology entrepreneur).	

The final questions asked entrepreneurs for a general view of how the 23 shifts would affect marketing. Again, this there were a variety of responses. Some saw opportunities for marketing innovation, whilst others were less convinced. Those that saw opportunities found difficulty in being precise about how they would manifest themselves. Others could not envisage how the 23 shifts might be central to marketing strategy.

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Discussion

The 9 types of entrepreneur agreed that the 23 shifts would influence market orientation, business decision-making and collaboration/partnerships in some way. There was no self-indulgence on the part of entrepreneurs that they could resist the inevitable changes posed by the 23 shifts. Indeed, all entrepreneurs recognised opportunities and challenges. However, the level and nature of their adoption of new technologies varied tremendously. There is no agreement between the 9 types of entrepreneur in relation to the specific challenges and opportunities.

There were other drivers, such as context and market, or the type of entrepreneur per-se e.g. rural or social entrepreneurs saw different challenges than technology or E-preneurs. So perhaps the 9 types of entrepreneur is too broad a typology, and further research should refine them into groups or consider single types e.g. portfolio entrepreneurs, lifestyle entrepreneurs and serial entrepreneurs as a group, or intrapreneurs as a single type.

Some entrepreneurs saw the importance of most of the 23 shifts including the intrapreneur, E-preneur, serial entrepreneur and technology entrepreneur for business decisions in the future, and marketing. However, others saw little or no importance in the 23 shifts including the lifestyle entrepreneur, the rural entrepreneur, and the portfolio entrepreneur for business decisions in the future and marketing**.** Therefore the shifts themselves might be connected more closely to those entrepreneurs most likely to encounter them.

Any future research might also employ current theoretical frameworks such as TAM/TAM 3 (Vankatesh 2008) or UTAUT (Vankatesh 2003) to connect with technology or ecommerce accessibility. However, there are widely recognised limitations with these models since they are not really a 'theory,' they contain questionable heuristic value, limited explanatory and predictive power, triviality, and lack of any practical value (Chuttur 2009). Also the 23 shifts are not really something that is experienced in the same way as a computer or similar device. In fact how entrepreneurs and customers interface with the 23 shifts is not entirely clear.

Conclusions and Recommendations

Entrepreneurs will face a number of opportunities and challenges from the Fourth Industrial Revolution, although the nature and extent will depend on the type, or groups of types, of entrepreneur. Their openness to new challenges, and especially technologies, will determine the extent to which they seize them. Context and industry play a key role, and the level of connection with the 23 shifts is an

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influencing factor. Finally, current theoretical frameworks may not be useful in their present form, and may need to be adapted or even replaced.

Clearly, this paper provides an initial investigation into this topic. It offers an overview of the views of the 9 participants. Further research will need to evaluate and analyse marketing opportunities and challenges in much more detail. The specifics of current marketing knowledge need to form antecedents and a framework(s) which can be used with a variety of both qualitative and quantitative research instruments. The foundation of new research might be based around Transformative Marketing (Kumar 2018) and the Fourth Industrial Revolution (Schwab 2016). Core topics should include the marketing opportunities and challenges provided by all new technology and the 23 shifts. The entrepreneurial context should consider environmental resources (renewal and preservation), economic forces (growth/employment/the nature of work), customer preferences and their expectations, Government regulations (national and global) and competitive forces and megatrends (physical/digital/biological).

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