

How Re-Distributive Manufacturing and Agile Working May Impact Social Networks of the Future

Aim:

To investigate the social aspects and changes in human relationships that may be arising with the development of Re-Distributive Manufacturing (RDM) and Agile Working, based upon a business analysis of the South West of England and applying a conceptual DSPIR model.

Background:

Recent ONS data (2015) shows that 22.2% (9.02 million) of 16-64 year olds in the UK are not in the labour force or seeking/ available for work and only a further 5.5% (1.81 million) of the unemployed *are* seeking work. Overall, over a quarter of the potential workforce of the UK is not participating fully in the economic sphere. Martin Ford suggests in his book 'The Lights in the Tunnel' (2009) that this is just the start of the problems of unemployment. In this new age of increased automation, brought on by rapid technological advancement, many of the 'average' jobs in the developed world are beginning to be partly or totally replaced by automated systems. In an attempt to save money automation becomes the cheapest way to save the business. Here lies the classic capitalist issue of trying to maintain the highest surplus value (Marx, 1848) while keeping the business alive. Ultimately, according to Ford, this is a sure way to destroy the current (capitalist) economic system because by reducing the work force, we also reduce the population able to consume and support the demand for continued production.

However we are also seeing positive economic and technological developments in response to these changes. In the past few decades new materials and certain kinds of knowledge and technologies which were previously only available to large businesses and industries, have become more easily accessible to members of the general public. From an increase of those participating in higher education to the boom of the home-based 3D printing industry, the opportunity for small scale local production and self-employment is becoming more common. Those with sufficient social or economic capital (Bourdieu, 1986) can now begin to compete with well-established industries by cutting out much of the bureaucratic process usually experienced with traditional systems. This means that these new businesses can eventually expect nearly zero marginal costs, as they deal with fewer expensive links in the chain between the purchasing of materials and consumption of the product (Rifkin, 2014). With fewer costs (and potentially fewer risks) the idea of starting one's own business is becoming more appealing and accessible to members of many social classes, particularly to those threatened by unemployment at the hands of workplace automation.

Since 2008, the rise in total employment has predominantly been among the self-employed (ONS, 2014b). Self-employment in skilled trades and professional occupations has seen rises of 9.9% and 19.2% respectively from 2009 to 2014, and together count for 1,969,000 of the total 4,573,000 self-employed last recorded. These two groups represent the most popular professions taken up by the self-employed. This rise in self-employment in both manual and knowledge based jobs indicates recent developments in the economy of Redistributive Manufacturing. This new style of economy can be defined as:

"The drive towards smaller scale local manufacturing caused by changes in transport and labour costs, the availability of materials and energy, the need for sustainability, the availability and cost of small scale equipment, and access to information" (EPSRC, 2013).

It also involves the technologies and systems which will change the scale, location and organisation of manufacturing. RDM is an economic system that can be applied to all areas of production and consumption (from mechanical engineering to medical professions) and is strongly linked to increases in small scale self-employment. A further inextricably linked concept is that of 'Agile Working'. This is defined by The Agile Organisation as a method of working which incorporates time and place flexibility, whilst striving to 'create more responsive, efficient and effective organisations based on more balanced, motivated, innovative and productive teams and individuals' (Allsopp, 2010). From this economic background, we can see that there will also be social changes alongside shifts in the manufacturing world.

Methodology:

This report will use the conceptual DPIR model (*Driver-Pressure-Impact-Response*), adapted from the original DPSIR model (IEHIAS, 2015), to enable a more social rather than environmental analysis of the current socio-economic situation. The 'State' stage was removed from the original model as it was found to be too focussed on the scientific measurement of the ecosystem and thus had little immediate relevance to the themes discussed here. The following are the definitions of the other stages used in the models:

- *Drivers* – Recurring social, economic and demographic developments in society that fulfil certain 'human needs'. These tend to be more qualitative in nature and can be defined as a clear starting point for a chain of effects. There may be many individual drivers that could be identified under one broader heading.
- *Pressures* – Theoretical effects of the drivers on society. Can be quantified and measurable.
- *Impacts* – Real world developments, both positive and negative, which affect the social system/ structure as a result of pressures. This effect may be identifiable in local communities, at a more individual level.
- *Response* – Decisions made by humans to adapt to the effects of pressures and their impacts (e.g. policy changes).

The Technological Development Model:

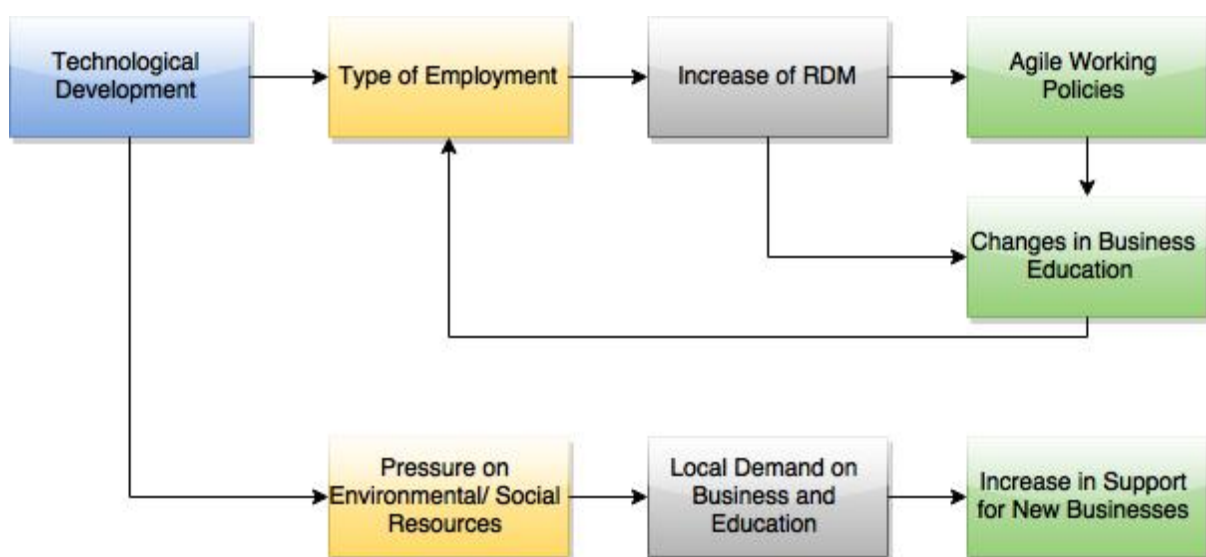


Figure 1: DPIR Flow Chart using Technological Development as the driver

Model Summary

Technological development is a continual force within human society, revealing its greatest potential during the industrial and digital revolutions. It is a driver for the many needs of humans, having reformed all areas of society from food to medical care and contributing massively to new forms of organization and interaction alongside electronic information networks (Castells, 2000). The following is a list of the possible sub-drivers which may exist under the general heading of 'Technological Development' (NATRI, 2002):

- Biotechnology
- Gene Technology
- Redistributive Manufacturing
- Communicative Technology
- Information Technology
- Assistive Technology

For this model, the general effect of technological development on automation will be the focus. As mentioned previously, increasing automation is replacing simple service and factory based jobs with a cheaper, mechanical alternative. It has always been the case in the rational economic world that those in employment are at risk of losing their jobs due to a restructuring of the kinds of employment available. This is the first identified pressure of the driver of technology. From this, we see the rise of RDM as a now viable option for those becoming unemployed – the real impact on society. Clearly, if RDM becomes more widespread in the next 10-20 years then certain policies will need to be implemented in response. Particularly important will be those relating to education and the decentralisation of the workplace, to accommodate for effects of agile working.

Turning to the second branch in *Figure 1*, another pressure brought on by general technological development is that of demand for environmental and educational resources. Individuals generally do not have the networks to source cheap materials or energy from abroad, therefore these resources are more likely to be locally sourced or produced. Rifkin (2014) points out that small and medium sized companies are already beginning to collaborate in producing green energy, lowering costs further than if fossil fuel or nuclear energy from the main grid was used. Furthermore, the demand for educational resources relating to start-up businesses is clearly demonstrated by the prominence of certain types of events put on in regions of the UK (Business West, 2015). For example, in the South West a large number of events cater to 'Digital & Hi-Tech' and 'Workplace Training' needs (see Appendix 1), largely organised by current employees to support those new to the labour market or those seeking to expand their presence within it. Local, member led careers based sessions may eventually be more widespread, government funded and even included within the education system in order to support the growth in self-employment.

Analysis

The following analysis will discuss the closely related social impacts of (1) family structure/relationships and (2) business relationships.

Social Impact One: Family Structure

Firstly, due to this process there will be changes in family structure both present and future. The traditional workplace has long been one where a constant flux in employees means that there is an opportunity for new and regular social interactions. Relationships, both romantic and platonic, are thus an inevitable side effect of employment and in one study of the workplace, as many as 18% of

respondents said they have been romantically involved with a work colleague (TWF, 2009). The expectation of being involved in a workplace romance at some point in life is deeply embedded in British culture. However, this is potentially under threat from changing ways of working.

On one hand, agile working allows networks of individuals to grow and so encourage the flourishing of more romantic/ platonic relationships. These individuals would benefit from 'hyper involvement' as a side effect of the RDM economy, meaning increased contact with a wider range of peoples. On the other hand, for those attempting to start up their own businesses in this new economy there may not be time for anything other than business when networking. To get a business 'off the ground' requires time, money and a focus on gathering resources. Socially, we can expect that there may only be time to maintain the relationships an individual has already formed and build new relationships only for business purposes. With a new growth in the self-employment and more people choosing their careers over family, we may see the latter path becoming more common.

An important aspect within this is gender equality in the economic sphere, which has increasing potential to become balanced. The glass ceiling prominent in the current capitalist system can be avoided, if not entirely broken by the arrival of this new economic model which would allow more women to 'become their own boss' and set their own workplace standards. The presence of women in work has increased from 53% in 1971 to 67% in 2013 (ONS, 2013) and this trend must surely continue to increase. The effect of this on the 'traditional family' is that having children may be put off until later in life and in some cases there may not be the desire for any children at all. This trend is partly a result of greater access to the labour market and the chance for individuals to actually 'follow their dreams'.

Another impact of RDM on the family is that we may see a return to the home-based labour of the pre-industrial era. The arrival of virtual working and decentralisation of the workplace allows individuals to work from home even if they work for a large corporation and are not self-employed. As Sassower states "every start-up company or group of people can ride the Internet wave and exploit an already existing infrastructure at minimal cost" (2013). As quickly as women have populated the workplace both men and women have begun to return home. In the UK, the numbers of home workers has increased from 2.9 million in 1998 to 4.2 million in 2014. In comparison to this there are (as of January 2014) 25.9 million non-home workers (ONS, 2014a). Again, this trend is potentially set to increase with the growth of RDM and self-employment – in 2014, 63.5% of home workers were self-employed (ONS 2014a).

The effect of this may be a decline in any work-family conflict identified in previous studies. In Kelly et al's study (2014), the absence of someone to provide childcare and home based labour, caused by both partners in a couple working full time, was shown to have practical, emotional and psychological impacts. These could be avoided by the impact of policy changes, particularly those encouraging agile working which would allow the home to become the base for employment. However, whilst there is some way to go before working can be completely home based and employment can be completely virtual, studies show progress in this regard. Nandhakumar's study on trust and virtual team-working (1999) showed that there is still a need for socialising face to face with co-workers in order to build trust. He recommends that organisational policies promote opportunities for social interactions so that business relationships can then be built upon the mutual trust afforded by social ones. This insinuates a gradual dislocation from the office as the central workplace, towards a more dispersed and decentralised one. Whilst this means the family home may not become the dominant focus of employment once again, it becomes another alternative for the modern employee. It offers opportunities to resolve some workplace tensions, thus becoming beneficial to individuals who choose to work this way. According to Becks' (1994) theories of reflexive modernization and

individualization, this is one such way that individuals can now choose to construct their own biographies. We have greater control on certain aspects of our lives which enable us to choose how we live and how we define ourselves.

Social Impact Two: Business Relationships

The effect of RDM and business/ education demands on business relationships in our current social structure are another key impact to be discussed. This follows from ideas about the decentralisation of the workplace and the need for mutual trust in virtual working relationships. Underlying all of this is the shift in communicative technology.

Old conceptions of business as centrally located in one office or site should no longer be considered as 'the norm'. Due to the rise of the 'networked information economy' which eclipses the previous 'industrial information economy' (Sassower, 2013), access, manipulation and exchanging of information can take place with greater ease and pace. The infrastructure to communicate now exists and so technologies like Skype and Email services start to provide some distance between the old and new structure of the workplace. Those employed to work in certain services no longer need to visit the office every day of the week, as materials can be found online to work from, rather than being stored as hard copies in the office. Conferences can be held online, seminars (or 'webinars') can be conducted via Skype and the internet is continually expanding its depth and breadth of information. The technology now exists to support businesses online and so the drastic change we may see in the near future is how fast the connection is to these programmes will become. Will the hologram technology popular in sci-fi films and TV actually become a reality in the business world in the future, allowing virtual 3-D presence of individuals? This seems possible, and it may eventually be the end point of workplace decentralisation.

Business, like much else in this modern era, is therefore no longer bound by geography. As a result of this communicative revolution institutional change is forced, particularly in defining and redefining the hours of the working week (Rifkin, 2004). Time is a commodity and there is some pressure to see it as totally flexible – hence the idea of introducing the 21 hour working week. The idea is that more employees are taken on but must all work shorter shifts. Modern western society has both the time, money and technology to reduce the hours worked and thus the stress on the average person. Some sources argue that the benefits of redefining the working week would help solve issues like safeguarding natural resources of the planet, underemployment and improving the quality of life through more free time (New Economics, 2010).

Particularly important in this report is the social effect of reducing the hours of the working week. Firstly, we may see further declines in the networking ability of employees, who spend less time in the office and thus fail to develop necessary group norms and social controls in the workplace (Jackson, 1999). In present times, those who fail to regularly turn up to work or who work part time tend to become less integrated in the office 'culture'. Is 21 hours a week really enough time to allow social bonds, controls and trust to flourish? Potentially not, if the quality time of home and family life is prioritised over that of business. Secondly, we should assume that 21 hours would not be consistent between businesses at different stages of development therefore benefits for different sized businesses vary. For example, more hours per person tend to be needed to get a smaller business off the ground than for bigger businesses, who may have suitable quantities of employees that they can all be on rotation working similar numbers of hours. Therefore, there may be greater opportunity for employees of smaller businesses, while working longer hours, to socialise and form stronger social bonds. This may put smaller business at an advantage to the corporate giants who focus too readily on economic profit over the development of social capital. The individual is too often abused at the

hands of big business, one such example being that of the intern Moritz Erhardt who died after working until 6am three days in a row whilst interning for the investment bank Merrill Lynch (Gallagher, 2013). Further incidents like this often go unnoticed due to the lack of direct cause between long working hours and stress related deaths. Yet progress towards the shorter working week is still slow. Rifkin (1996) states how the Japanese government in 1992 sought to become a 'lifestyle superpower' and to create a healthier, leisurely environment for Japanese workers primarily by reducing the working week from forty-four to forty hours. This minute change hardly seems comparable to the suggested, but not implemented, 21 hour work week now discussed in economic circles.

Conclusion:

Social and economic change is inevitable in any society and the potential effects of current changes have been briefly discussed here. Both time and geographical distance between people are significant factors to consider when investigating the social effect of business on family and working relationships, particularly since the advent of high-speed communication technologies. Policy should be changed as a result of findings, to allow more equality in the home (i.e., equal maternity and paternity leave) and at work (adaptation to a shorter, more appropriate working week). This report concludes that in order to understand modern social relationships, it is important to track the technological and the changes in communication in both the family and business spheres.