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## **House of Lords Select Committee on Artificial Intelligence**

### **BIFM submission to Call for Evidence**

1. The British Institute of Facilities Management (BIFM) welcomes this opportunity to provide feedback and evidence on the state and impact of artificial intelligence (AI).

#### **About BIFM**

2. The BIFM is the professional body for facilities management (FM). Founded in 1993, we promote excellence in facilities management for the benefit of practitioners, the economy and society.

3. We represent and support over 17,000 members around the world, both individual FM professionals and organisations, and thousands more. We do this through a suite of membership, qualifications, training and networking services designed to support facilities management practitioners in performing to the best of their ability.

4. We also provide guidance and support research that will help increase workplace productivity which will ultimately contribute to raising standards, a happy workforce and healthy economy, and provide a platform for meaningful and evidenced debate on issues of importance.

5. Based in the UK, BIFM's global reach has been formalised during the last few years by establishing regional operations in Ireland, the United Arab Emirates and Nigeria. In total, BIFM is represented in 80 countries across the world.

#### **About the BIFM Technology Research Task Group- AI Sub-Group**

6. BIFM often works together with industry experts to ensure that it can provide a voice and expert knowledge where needed on technological matters. This submission was prepared with the expert input of the BIFM Technology Research Task Group- AI Sub-Group. This group advises, collaborates and works with BIFM representatives to share knowledge in technology advancements with BIFM, its members and across the FM profession.

7. In addition to being FM experts, these BIFM members work with AI in smart buildings and intelligent management systems to help manage businesses' estates. The submission should be read against this background.

#### **About FM**

8. "Facilities management is the organisational function which integrates people, place and process within the built environment with the purpose of improving the quality of life of people and the productivity of the core business".<sup>1</sup>

9. Facilities management encompasses multi-disciplinary activities within the built environment and the management of their impact upon people and the workplace. FM contributes to the everyday functioning of hospitals, airports, universities, ..., down to ordinary businesses. By making the workplace as efficient as possible, the facilities manager has a major role to play in making the UK a more productive place<sup>2</sup>. At the same time, without FM support, the economy would grind to a halt.

10. The health of the wider FM industry, which accounts for around 7% of GDP<sup>3</sup>, has a major impact on the overall UK economy and plays a positive role in supporting the government's climate change targets and societal and modern slavery programmes amongst others.

11. Key facts about the FM Industry:

- The UK FM Industry accounts for around 7% of the UK's GDP<sup>4</sup>
- The value of the FM sector is put at up to £120 billion<sup>5</sup>
- FM employs almost 10% of the UK's workforce<sup>6</sup>

<sup>1</sup> [International Standards Organisation ratified definition](#)

<sup>2,8</sup> [The Stoddart Review – The Workplace Advantage](#), (December 2016), 42p.

<sup>3,4</sup> FM Business Confidence Monitor, (May 2015), 12p.

<sup>5</sup> Value Judgement, Facilitate, FM World, May 2017, p. 49

<sup>6,7</sup> Has Brexit hit home yet? Insights into facilities management, Issue 17, p. 17-18

- In parts of the industry, up to 24% of the FM workforce are EU nationals<sup>7</sup>
- An effective workplace can improve productivity by 1-3.5%, potentially delivering a £20 billion uplift to the UK economy<sup>8</sup>

Please find below a response to your specific artificial intelligence (AI) inquiry questions:

### **The pace of technological change**

**Q1. What is the current state of artificial intelligence and what factors have contributed to this? How is it likely to develop over the next 5, 10 and 20 years? What factors, technical or societal, will accelerate or hinder this development?**

12. One could argue that AI is at an embryonic stage, the outer edges of its shape of design have been drawn providing a framework for advanced function and deeper learning. At the same time, the current state of AI is already at a significantly developed state- the progression of all aspects of computing as well as economic drivers have allowed a steady progress from advanced calculations to problem solving and now modelling the human brain.

13. The pace of development is only to accelerate in the coming 5-20 years owing to the consistent advances and dependency on technology in our work and personal lives. The future shows even more advanced applications in nano-technology as well as quantum computing, so with evolving frameworks along with Moore's law (the number of transistors per square inch on integrated circuits has doubled every year since their invention, allowing for increasing processing power and computation speed, a trend which will continue into the foreseeable future) and further societal adoption the development will continue to integrate with more and more granularity. Automated transportation, cyborg technology, connected work/home spaces and supply chain logistics, replacing workers of dangerous jobs and care assistants are key areas that AI will help advance over the next decade.

14. Due to the potential for such far reaching change across society the main factors on how it will unfold, and the pace it will unfold, will depend on the balance that can be struck as society adapts to functioning and existing in a connected world.

15. Access to large amounts of big data, faster equipment and processing speed and advanced machine learning are technical factors contributing to the advancement of AI. Technical factors and societal factors (i.e. the public's level of trust in a safe application) are the two factors likely to either hinder or accelerate the speed of AI growth and its adoption.

16. In addition to the above, it is important to stress that the commercial benefits of AI for FM (and beyond), mainly automation and improved customer service, are enormous and the potential for true progress exists at the heart of AI.

**Q2. Is the current level of excitement which surrounds artificial intelligence warranted?**

17. Every hour millions of devices, the Internet of Things (IOT) and other platforms gather billions of data points. The rate of accumulation is growing exponentially and we are now able to leverage the insight and learning this data can offer but the only way we can leverage the power and value of such data is through computing power and artificial intelligence. Advancements in machine learning, reasoning and perception are helping us enhance people's quality of life in areas including education, transportation, healthcare and building automation and management. The potential to uncover new insights, solutions and predictions from this dataset is very exciting.

18. The promise from AI is an enhanced experience alongside automating routine processes. If it delivers on this promise it will open further doors and harness a potential which does warrant the excitement.

19. However, this will be dependent on effective human input, in terms of control and communication, to ensure AI does not become a factor that has a negative impact upon our lives both in a work and personal sense. In addition to this, we should ensure that we do not become dependent on AI or allow it to become a dominant tool for facilitation across a range of areas.

### **Impact on society**

**Q3. How can the general public best be prepared for more widespread use of artificial intelligence?**

20. Advancement in AI (machine learning, reasoning, perception) is helping us enhance people's quality of life in areas including education, transportation, healthcare, manufacturing, building automation and management. The potential to uncover new insights, solutions and predictions from the further use of data is very exciting. However, trust is hard to earn and easy to lose. Those companies looking to leverage AI's

value must reassure the public as to the security and privacy of this data. Facebook, Amazon, Google, Apple, Microsoft are but some of the largest companies currently using AI. These companies are in effect rebranding AI to their products such as SIRI, Facebook Photo Tags and Google Ads. The public are being introduced to AI via these products and platforms. Softening the AI term and transforming it into usable consumer products is introducing the wider public to the power of AI although they do not know it. Business should be more open about this, and educate its consumers about the potential and its limitations so the public can understand AI better.

21. With the potential around AI being so large, its impact will be everywhere. The capability to revolutionise entire industries over very short periods of time, if not properly administered, will lead to widespread issues at every level. Strong leadership is needed that both understands and can harness AI's potential. The policing of this space is also a unique challenge within an ever-changing environment to anticipate and avoid potential problems. It also requires clear and fair governance to make sure this learning system does not cross certain lines.

22. It is important to remember that technology should remain an enabler for progress. Indeed, the widespread use of technology in the past has been an effective enabler allowing us to advance academically, technically and functionally in developing our lives across service, financial and educational forums. However, what is the tipping point at which society is no longer happy for AI to perform its function without supervision or evaluation? Which is the point where we do not want to be dominated by an AI application, which was created in relation to socio-political necessities? At which point do we become concerned about privacy and overall ownership of information, and specifically data? To use examples, the use of Google, Facebook and other tech services have accelerated to such a point where it has become difficult to know, individually or collectively, how much we are in control of information and what are the potential impacts (positive and/or negative) arising from this.

23. For these reasons, Government and commercial/large scale users have a duty of care to ensure two things. Firstly, the general public should be educated about AI, its potentials and the changes it will bring about. Secondly, that society continues to reap the benefits of this technological progress. Government, together with key stakeholders, should have an ongoing dialogue which addresses these two points.

24. In addition, education and lifelong learning have a key role to play in mitigating the changes that will be occurring in the workplace, where AI will change the way people work. Young people must be familiar with the technology when they enter the workplace. To help prepare those people whose jobs will be most affected, programmes of lifelong learning should be advocated to retrain people to ensure they retain marketable and needed skills.

#### **Q4. Who in society is gaining the most from the development and use of artificial intelligence and data? Who is gaining the least? How can potential disparities be mitigated?**

25. Big business and government/state will benefit the most from the development and use of artificial intelligence and data unless the journey in the roll out of AI is so disruptive that the current model is changed.

26. Business will be benefitting especially because of the ability to utilise AI in furthering their profit and growth. From Facebook image recognition using 120m parameters to automatically tag users, Siri, Cortana, Alexa voice assistants processing our voice instructions, and Amazon tailoring its purchase recommendations for us.

27. In addition, those countries with large gross domestic product (GDP) and where the government is communicating and supporting effective integration of AI, in both private and public companies, will be mainly benefitting too.

28. In comparison, generally those with limited or no access to AI both in business and personal arenas will be gaining the least. At the same time, people doing roles that can be automated, like lorry drivers to call attendants, will lose out along with areas of society that struggle to integrate in a connected world. Up to 30% of UK jobs could be impacted by robots utilising AI<sup>9</sup>. This can be mitigated by integrating AI universally within society where possible. At the same time, in those businesses where workers will lose out, new jobs will be created because of the use of AI. Lifelong learning is essential here to retrain and retool people, even though this will require investment and training opportunities. Proactive societal diversification will be needed to allow AI to be fully embraced through its own journey.

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<sup>9</sup> PwC, *Up to 30% of existing UK jobs could be impacted by automation by early 2030s, but this should be offset by job gains elsewhere in economy*,

<https://www.pwc.co.uk/press-room/press-releases/Up-to-30-percent-of-existing-UK-jobs-could-be-impacted-by-automation-by-early-2030s-but-this-should-be-offset-by-job-gains-elsewhere-in-economy.html>, accessed 8<sup>th</sup> September 2017

## **Public perception**

### **Q5. Should efforts be made to improve the public's understanding of, and engagement with, artificial intelligence? If so, how?**

- question taken together with question 10- **The role of the Government**

### **Q10. What role should the Government take in the development and use of artificial intelligence in the United Kingdom? Should artificial intelligence be regulated? If so, how?**

29. There is an element of fear when it comes to AI and understandably so. Workforce replacement and technology collecting data about our everyday movements and actions reflect negatively on AI. Previous revolutions of technological change have not led to an overall loss of jobs, but rather have disrupted the types of jobs people do and the way we work. For example, the retooling of the old textile factories led to job losses for workers, but new jobs were created.

30. Likewise, AI will create jobs as companies look to leverage it as a tool to help minimise operating costs and explore new market opportunities. There needs to be transparency and reassurance given to the people that AI has more potential for good.

31. Government, public bodies and private companies should begin to lead the dialogue showing the benefits and talking about the risks to help stimulate the conversation. Government in first instance should learn from the people creating the technology set and business leaders in the space. Public figures and specialists in this space are beginning to share their thoughts with large audiences and even beginning to lead the debate – more of this is required.

32. Due to the far reach of AI a basic education and understanding should be had by all the public, to ensure a positive response and progressive growth of both AI and society as two connected elements. Whilst AI is not 'organic', effort should be made to integrate it within society for the public rather than private companies or individuals simply flooding the markets of business and education with AI.

33. Government has really three roles to play. Firstly, it should be a custodian of this dialogue, which should enable greater understanding and then adoption/acceptance. Government has got a series of tools available to enable the dialogue, through marketing campaigns (like for example Start4Life) to educate people, providing a platform for discussion such as a review or leaders group. In addition, Government can build on the technology curriculum available in schools to ensure that next generations leaving school understand the benefits and limitations.

34. Any such dialogue should ensure that it has got a variety of stakeholders engaged beyond big business, including but not limited to academics, educational bodies, professional bodies and consumer bodies as they have a big role to play in pushing out and amplifying the message. Life-long learning, as mentioned earlier, has got an important role to play, not just in making people aware of the changes and opportunities of the technology, but also to enable them to remain in an ever-changing job market by ensuring they have the right, required skills.

35. Secondly, Government should build on the dialogue and rise to the challenge to provide a wider framework strategy for AI in which to provide security and stability for a space which is difficult to control. There needs to be a framework strategy which guides the roll-out without stifling AI's growth. The overarching principle governing such roll-out is to protect the disadvantaged areas to make sure the progress does not create a tidal wave, or in other words that the rewards are reaped for the benefit of society and outweigh the disadvantages. Other key starting principles should be around security, accessibility and privacy. Once established, reform can be looked at to ensure the framework remains relevant and up to date.

36. At this point in time, strict governance enforced from Government downward will only limit the potential of these people and the technology. However, this does not mean that there should not be some regulatory tools in place to penalise businesses or individuals for example misappropriating the use of AI or acting outside regulatory controls in place. One such example of a regulatory instrument in place is the UK Data Protection Act which is in the process of being updated in line with the General Data Protection Regulations where consent is put at the heart of any data use.

37. Thirdly, Government should also play a role through leading by example and enable the adoption of AI within society by both encouraging research and innovation in this area, but also by encouraging adoption of

the applications within its own Government operations. From an FM perspective, that is the adoption of data driven decision making when it comes to the assessment, utilisation, analysis and resultant actions associated with the use of space (and therefore the highest element of the occupancy cost) and the workplace environment with its direct impact on productivity<sup>10</sup> as but two examples. The application of tools such as Building Information Modelling (BIM), when designing new buildings. The forthcoming Industry Strategy should ensure that it includes such considerations from an FM perspective given that it represents c80% of whole life costs associated with the management and operation of the Built Environment.

## **Industry**

### **Q6. What are the key sectors that stand to benefit from the development and use of artificial intelligence? Which sectors do not?**

38. Most, if not all sectors have the potential to improve dramatically via the application of Deep Learning (a sub method of Machine Learning) and AI; healthcare, manufacturing (and any labour heavy unskilled sectors), transportation, customer services, finance, entertainment and even sport.

39. FM as a sector will continue to benefit from AI by way of further improving overall business intelligence and customer experience across all the sectors it supports in their core business activities.

40. Process orientated and predictable services will gain from a manufacturing efficiency perspective but from a job perspective they are likely to lose out.

### **Q7. How can the data-based monopolies of some large corporations, and the 'winner takes-all' economies associated with them, be addressed? How can data be managed and safeguarded to ensure it contributes to the public good and a well-functioning economy?**

41. Data-based monopolies of some large corporations and the economies associated with them will need strong leadership and internal governance to prevent a continual repeat of the 'winner takes all' model. Alternatively, business need to have corporate governance safeguards in place that are part of its own fabric and as such would break the current model from within.

42. The use of AI by large corporations could potentially increase the likelihood of globalisation through use of a new forum. When it comes to data management, there should be clear and effective steps taken to distinguish and safeguard the rights of individuals within society in relation to the economy when observing the impact of AI. The use of the media has been something that large corporations have benefited from previously with recent incidents where financial figures were hidden from the general public. To have a functioning economy transparency is key, where applicable, as is discretion. The difficulty is to keep the balance between those.

43. In terms of management and safeguarding of data there should be effective barriers where AI cannot be hacked or used in general to obtain sensitive data of any nature. This is where a Government-led dialogue is key, to ensure that there are some parameters in place wherein AI can operate. This will also ensure that there is transparency about obligations and restrictions for the benefit of society which in turn will help with societal acceptance of AI.

### **Q8. What are the ethical implications of the development and use of artificial intelligence? How can any negative implications be resolved?**

44. The ethical implications of AI are its impact on society in terms of privacy, consent and safety. In addition, it affects diversity and has the potential to shaping democracy. AI is primarily a decision-based cause and effect mechanism. Human accountability for machine led decision-making would help to resolve negative implications by way of keeping the use of AI within acceptable and agreed parameters.

45. In terms of capturing and using personal data, the General Data Protection Regulation and the forthcoming updated UK Data Protection Act are a good start as they put the concept of consent at the heart of data use. They impose an opt-in principle which should help raise awareness of which data and why data is being captured. Indeed, people have got to be made aware of how data is being captured, who owns it and how it is /may be shared. AI relies on already existing datasets which are already being collected from people.

46. The development of AI has the potential to negatively affect unemployment rates (even now that they are at their lowest for some time). Those engaged with AI need to ensure that the benefits of AI outweigh its negative impacts. As mentioned before, a structured and well-defined roll-out of the technology is needed, as well as encouraging people to retrain and diversifying competencies to enable the successful transition to

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<sup>10</sup> [The Stoddart Review – The Workplace Advantage](#), (December 2016), 42p.

an AI confident and knowledgeable society. As mentioned above, both Government and a range of stakeholders have an important role to play in setting the parameters of AI operation and leading on the dialogue that is necessary to enable wider societal acceptance.

**Q9. In what situations is a relative lack of transparency in artificial intelligence systems (so called 'black boxing') acceptable? When should it not be permissible?**

47. The lack of transparency is only appropriate where sensitive data /information is at risk of being exposed. At all other times, transparency should be advocated. If not, this could constitute a breach of ethics and create much discord and distrust in society.

48. AI should follow the example of existing technology sets out there such as cryptocurrency, big and cloud data, banking and medical data. AI is just a connecting tool allowing for the layered learning at rapid cycle rates. If AI is placed into existing technology sets that have already been bedded in, then they should follow whatever acceptable transparency levels already set.

49. To protect intellectual property a degree of black boxing would make sense however anything that would breach a person's human rights should not be allowed to exist inside such a space.

**Learning from others**

**Q11. What lessons can be learnt from other countries or international organisations (e.g. the European Union, the World Economic Forum) in their policy approach to artificial intelligence?**

50. BIFM does not have any comments as to what particular policy approaches from other countries or organisations would be helpful. In general, as with the world of computing before there are always lessons to be taken away from others' approach to a similar topic. Given the learning curve AI is still going through, there will inevitably be a degree of trial and error. By sharing the learning with others, the gaps will close a lot quicker.

51. Looking at other countries and organisations would allow us to benchmark ourselves as a country and to compare our ability to manage the technology and our policies and regulatory framework.

52. Further to this such comparison would allow us to measure how much or little we allow AI to be integrated socially, culturally, economically and the political implications it could have on our society.

**Conclusion**

53. While the FM industry has grown exponentially over the last decades, it now faces a skills gap due to the UK's demographic change and a lack of applicants with the required aptitude. The uncertainty over a new migration policy adds to that challenge.

54. The skills gap needs a multi-faceted approach to ensure that the UK's FM industry can deliver its potential of a £20 billion uplift to the UK economy by enabling an effective workplace to the UK's businesses as well as retain its status as one of the most mature and developed FM markets in the world. A flexible migration policy and upskilling people are part of the solution. However, those two approaches will not be sufficient to fill the skills gap and increase productivity.

55. Utilising advances in technology such as AI to enable smart buildings to maximise efficiencies and increase productivity in the workplace are but some of the opportunities that advanced technologies bring. AI will however also bring some further challenges. While upskilling people is part of the solution to the skills gap, lifelong learning will not just educate people about the potential of AI, it will also play an important role in mitigating the challenges of automation and AI and their impact upon our society, by retraining/upskilling people and thus enabling them to retain marketable and much needed skills.

56. The Government should consider the above multi-faceted approach as part of its forthcoming Industrial Strategy when looking at how to upskill people, increase productivity and furthering the potential of AI.

57. In general, Government has a pivotal role to play in facilitating the debate around AI and educating people to enable societal acceptance. In addition, Government can also provide a framework wherein AI can be developed and implemented, governed by principles. Furthermore, Government could lead by example and demonstrate how it is applying AI in its operational functioning.

58. When looking at AI and its role and impact in the FM industry, Government should include commitments in the Industrial Strategy to incentivising the research and use of technologies such as AI and automation. In addition, it could also further encourage the use of building information modelling (BIM) beyond the public sector into the private sector, including involving the private sector in public infrastructure projects. Furthermore, it could encourage more data driven decisions in Government's use of buildings.

8<sup>th</sup> September 2017