Verizon response to Ofcom's 'Promoting investment and innovation in the Internet of Things' call for input.

Section 1 - Introduction

1. Verizon UK Limited ("Verizon") welcomes the opportunity to respond to Ofcom's call for input on 'Promoting investment and innovation in the Internet of Things' (IoT).
2. Verizon is the global IT solutions partner to business and government. Collectively, all Verizon companies have over $120 billion in annual revenue and serve 98 per cent of the Fortune 500. Outside of the United States, Verizon caters to large and medium business and government agencies and is connecting systems, machines, ideas and people around the world for better outcomes.
3. Verizon Machine to Machine (M2M) Solutions are technology driven solutions that support wired or wireless communication between machines (devices) to capture events and translate them into vital information to enhance the quality of life of users, as well as create new ways to engage with partners and customers – resulting in better business outcomes.
4. Verizon is investing significantly in telematics and M2M services generally. As such, Verizon is particularly well positioned to recognize the enormous benefits and opportunities that come with M2M. M2M and the IoT represent the next leap forward in the evolution of Internet-based services by connecting machines, devices, and industries to improve delivery of services and process management to increase efficiencies often without the need for human interaction.
5. Please note the views expressed in this response are specific to the UK environment and regulatory regime and should not be taken as expressing Verizon's views in other jurisdictions, such as the United States of America, where the regulatory and marketplace environments differ from that in the UK.

Section 2 - Setting the Scene

6. M2M solutions are still emerging and in early stages of development. M2M is nonetheless already radically changing consumer interaction with utilities, healthcare, local government services and retail. M2M will also enable businesses to provide consumers with products and services that deliver personal, context-aware experiences, an advancement that will have a profound impact on how organizations do business and relate to their customers.
7. M2M is about new business models and applications of technology, rather than a technological revolution. It is therefore important to recognise that a sound policy framework is already in place to deal with many, if not most, of the issues relating to M2M. Whilst some elements may call for some fine-tuning of existing policies, there is no need to re-invent policy specifically for M2M.

8. Even more importantly, care should be taken to avoid policy or regulatory mandates that favour one technology over another or that could hinder the vast potential economic and societal benefits of M2M. This should go hand-in-hand with a flexible and light touch regulatory approach given the variety of stakeholders involved and the number of emerging business models. Indeed, care should be taken not to stifle innovation, which could impede the development of M2M and diminish its benefits.

2.1 Stakeholders

9. The M2M ecosystem is composed of many different stakeholders involved in the development and delivery of M2M services across a number of technologies resulting in the emergence of various new business models:
    - Hardware providers
    - Providers of communications devices
    - Telecommunications providers
    - Network operators
    - Roaming partners
    - M2M Aggregation/Service Platform operators
    - Application providers

10. In addition to the variety of stakeholders, the associated vertical-market applications encompass a variety of industry segments ranging from healthcare, logistics, to energy and transportation, to name a few.
11. From Verizon's perspective, significant existing M2M applications include:
    - Logistics (e.g. asset tracking, monitoring goods)
    - Industrial automation (e.g. off-shore facilities, monitoring pipeline infrastructures)
    - Healthcare (e.g. warning and monitoring capabilities of medical devices)
    - Transportation (e.g. automotive, fleet management, health monitoring)

12. The result being that M2M brings a new kind of convergence, this time between the digital world and the physical environment. It is important to underscore that M2M is often an enterprise application and as such may not require the same regulatory treatment as if it were consumer-facing. That's why M2M services should not be seen as just another telecommunications service. Against this background, for the M2M ecosystem to flourish, policy-makers need to focus on enabling the market and promoting innovation. M2M is not just limited to a specific service or technology; it contains various services and covers multiple areas. Indeed, it is essential to avoid policy or regulatory mandates that favour one technology over another or which could hinder the vast potential economic and societal benefits of M2M.

2.2 Main applications

13. M2M is radically changing interaction with utilities, healthcare, local government services, and retail.

2.2.1 Connected cars

14. One of the major M2M applications is the connected car; here are some examples among the many services Verizon provides (NB the specific examples are US-based).
15. Car companies like Mercedes-Benz and VW are using Verizon Telematics to make driving safer and highways less congested by detecting accidents, alerting first responders, etc.
16. Telematics can also reduce the costs and the carbon footprint of large commercial and government fleets. Verizon offers a solution called Networkfleet, which allows fleet operators to track fuel consumption, map out efficient routes and monitor the condition of their vehicles.

2.2.2 Healthcare

17. Some of the most compelling examples of “smart business” can be found in the emerging use of M2M in healthcare. In the U.S. alone, healthcare spending is expected to reach 20% of the economy by 2015. Technology is considered a means to help control costs and improve the quality of service, and this is where M2M is expected to play an important role.
18. M2M-enabled solutions will be used, for example, to monitor a patient’s condition whether they are in a care facility or at home. M2M services will make it possible for a physician to make a remote diagnosis based on the transmission of vital signs or other clinical data from one device to another. Patients will have devices they can use at home to monitor their conditions. M2M will also be used by hospitals, for example, to track the delivery and status of prescription drugs and to monitor usage-based medical equipment, helping streamline costs, and increase safety precautions.
19. Verizon offers two industry-leading health care products. First, Verizon has launched a product called Virtual Visits. Virtual Visits provides end users with a telemedicine service that allows anytime, anywhere access to a clinician using mobile technology, video conferencing, tablets, and smartphones. If a clinician’s care plan includes prescriptions, the clinician will have the ability to e-prescribe to the end user’s selected pharmacy as part of the service in certain states. Each end user will be routed to a “virtual clinic” of clinicians licensed and located in his or her state.
20. Second, with Verizon’s Healthcare-Enabled Services, companies can store, manage, and safeguard electronic protected health information (PHI) in Verizon’s secure hosting environment, making it easier to collaborate and coordinate care. Healthcare-Enabled Services for cloud, hosting, and colocation provide connectivity, availability, and reliability that can be prohibitively expensive for companies to manage themselves. Healthcare Enabled Services aligns with applicable Heath Insurance Portability and Accountability

Act (HIPAA)[1] security requirements and supports a connected infrastructure to manage and exchange.

2.2.3 Energy

21. Smart-grid initiatives now underway in the electric utility sector illustrate M2M's ability to make a transformative impact on that industry and society overall. In the near future, smart meters can help reduce energy consumption and associated costs, as will smart appliances that users can control and monitor via the network or handheld devices.
22. Energy companies, water agencies, and others are also finding that they can use new M2M technologies to support their mandates to contain or reduce costs, better manage the use of their assets, and conserve energy. Many are also operating with aged infrastructure that is slated for upgrades or replacement and will need to employ M2M solutions as they revamp these systems.
23. The possibilities for M2M services are limitless. Nearly any machine or device in any industry has the potential to be connected. M2M is fuelling innovation in the enterprise segment because businesses are realizing that smart machines and smart applications can take information from a system or the environment to create new revenue streams, control costs, and improve products and services.
24. This intelligence will lead to new products and services that promise real improvements in matters of fundamental concern. In turn, M2M innovation will drive new revenues and help control costs for businesses. By embracing the information and insight that M2M communications can provide, organizations in all industries will find ways to participate in and benefit from this technology renaissance. As they do so, they will extend its benefits to their partners, customers, and communities.

Section 3 - Resource Related Issues

3.1 Spectrum

25. Demand for wireless services, including the wireless connectivity that supports M2M, is growing exponentially and is projected to continue to grow at high rates. This increasing wireless connectivity will drive innovation, but it also will strain existing mobile network capacity. Technological advancements such as small cells and 4G LTE allow carriers to make more efficient use of spectrum. But even with these innovations, and in some cases because of them, the growth in demand has placed immense pressure on the need for more spectrum and is one reason why companies like Verizon would urge policymakers to identify and make available new spectrum to meet consumer needs.
26. That said, in order to encourage innovation and responsiveness to consumer demands, governments should take a technology- and service-neutral approach to mobile spectrum, both licensed and unlicensed. Users need flexibility to deploy spectrum without government rules earmarking or unnecessarily limiting acceptable users, uses, or technologies. While regulators need to impose rules to ensure that firms using the

[1] Pub. L. 104-181, 110 Stat. 1936 (1996).

spectrum do not interfere with one another or with government users, those rules should avoid dictating who can own licenses and, for both licensed and unlicensed users, what technologies they can deploy or what services they can or cannot provide to their customers. Another important role for government is to provide the basis for manufacturing economies of scale and global interoperability by working with other administrations worldwide to ensure that new spectrum identified for commercial mobile use is, to the extent possible, globally harmonized.

3.2 Numbering

27. Numbering-related issues are an important consideration for M2M deployment. There is indeed a risk of number exhaustion for M2M services that rely on traditional E.164 numbers. Allocating a specific number range for M2M could be an appropriate way forward.
28. Indeed, the new M2M business model requires innovative numbering solutions to accommodate the requirements of M2M customers and services providers.

3.3 International Mobile Subscriber Identity (IMSI)

29. In line with the above and keeping in mind the pan-European and global nature of M2M services, the availability and flexibility of IMSI resources is key for the long-term success of M2M services. Indeed, M2M enabled devices are designed for a long-term product lifecycle where it is difficult to predict whether end-users will travel with the service or whether end-users will sell their M2M-enabled devices to someone in another European country.

Section 4 - Approaches to Delivering M2M Services

30. Given the innovative nature of M2M services, service providers are likely to choose different business models to deliver services and should have commercial flexibility to pursue various options.
31. From an interoperability perspective, it should be expected that in some instances parties will seek to establish commercial arrangements where M2M services rely on local mobile networks to enable communication to central elements of M2M services. In this regard, it is also worth noting that there are models in place to distinguish M2M roaming traffic from traditional roaming services.
32. Separately, the already established existence of Mobile Virtual Network Operators (MVNOs) in Europe may be relevant to deployment of M2M services. MVNOs can support specialized market segments and therefore can provide an additional business model for delivery of M2M services.

Section 5 - Regulatory Approaches

5.1 General

33. Considering that M2M services use new business models and applications of technology, flexibility, transparency and market-driven solutions should drive its further evolution rather than highly prescriptive regulations.

34. Indeed, such a sound policy framework is already in place to deal with many, if not most, of the issues identified relating to M2M. Whilst some elements may call for some fine-tuning of existing policies, there is no need to re-invent policy specifically for M2M. As said before, care should be taken to avoid policy or regulatory mandates that favour one technology over another or that could hinder the vast potential economic and societal benefits of the M2M.

35. If there is to be government policy around M2M, its primary purpose should be to remove obstacles to expansion and innovation, and to create a framework for adoption. The focus should be on the enormous possibilities of M2M, including enhancements to transportation, the environment, public safety, and eHealth, to name just a few.

5.2 The European Regime for Electronic Communications Services and M2M

36. Certain questions arise given the specific European regulatory framework and market structure. As seen by the number of applications and stakeholders involved in the development and provision of M2M services, these should not be seen as just another telecommunications service. Indeed, not everything that appears as an M2M service should be considered as an electronic communications service. For example, data transport is an ancillary component of the M2M service, not a principal feature. Therefore, regulators in the European Union should carefully consider whether there is a need to introduce new regulations for M2M or whether to focus instead on ensuring that a business environment is created that fosters competition and deployment of innovative new services in the European market place.

37. In considering the regulatory approach to M2M, National Regulatory Authorities should not lose sight of the fact that a key driver and attractiveness of M2M services is their truly pan-European and cross-border nature. They should provide as much flexibility as possible to support Pan-European markets and avoid fragmentation.

5.3 Authorisations in the European Union

38. Considering the pan-European nature of M2M services (and the complexity of the M2M ecosystem and geographical reach), it would be disproportionate and highly burdensome to require the M2M provider (when providing electronic communications services) to be authorised in each member state where its customers may be. Regulators should consider a sort of “one-stop-shop” approach for authorisations of M2M services in the EU.

Section 6 - Security and Privacy

39. Security and privacy are important aspects of many services, including but not limited to M2M services.

6.1 Security

40. Knowledge on security and safety is broadly available within the industry. The technology and security experts who develop the M2M applications themselves are in the best position to evaluate the type and nature of the data security, authentication, encryption, secure routing, and other standards applicable to the services they develop.

41. To provide the highest degree of protection to all involved parties, we believe that the best outcomes will be achieved through a flexible European framework that allows data controllers to select the best way to secure the customer's data. This also includes hardware manufacturers, software developers, and other parties that create the M2M ecosystem. Voluntary, industry-driven, and consensus-based standard-setting models will help ensure that industry is able to adapt technologies to the ever-changing cybersecurity landscape.

42. Furthermore, driven by market demand, there are strong incentives for the industry to provide high levels of security and safety regarding its services, including M2M, regardless of the specific application involved. Companies or services that fail to do so will not (and should not) survive in the marketplace. Given the ever-evolving nature of security threats and the concurrent evolution of technology, top-down regulatory approaches to security are impractical and potentially self-defeating. Promoting an environment that enables industry to voluntarily share information and best practices, and to collaborate as appropriate to defeat emerging threats, offers a more robust and flexible approach to security.

6.2 Privacy

43. Privacy is of key importance to Verizon. Nonetheless, it should be noted that Europe is not operating in a vacuum. Both the current data protection regulatory framework (Data protection Framework Directive and ePrivacy Directive) and, more importantly, the proposed Data protection Regulation aim to be horizontal, technology neutral, and "future proof". In other words, they should cover all privacy-related issues, including any that may arise within the framework of M2M. As such, there is no need for additional privacy principles or requirements for M2M applications.

Section 7 – Interoperability

7.1 Standards

44. A certain level of standardisation and interoperability may be necessary for M2M to develop. However, we believe that the fast-developing market itself is best able to define the right standards for M2M. Indeed, given the broad definition of M2M, there may be some areas in which standardization and interoperability are necessary and others where they are not. The market is a far better determinant of the need for standardisation and interoperability, and the developers of M2M technologies and services are far better positioned to know whether such standards are necessary and what they should be if they are needed.

7.2 Flexible and Secure SIMs

45. Interoperability considerations are also relevant with regards to SIMs or “soft SIMs”. We understand that the term refers to GSMA’s “embedded SIM” specification, which provides the necessary flexibility to support different business models. It does not describe capabilities that are fully software designed.

46. An embedded SIM is a physical device authenticating a user to a network which can be changed or modified over the air to meet the requirement of the M2M service provider or network operator. More importantly, it provides maximum flexibility while reducing the vulnerability to hacking. The current implementation experiences demonstrate how M2M services drive new solutions and create new opportunities.

Verizon
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