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The nine themes identified by ITR 2012 highlight the key technological developments that will play a significant role in steering the ICT sector in the next 3-5 years. Not only will each theme evolve along its own course, the inter-dependence of the themes will also create exciting opportunities in the form of convergence and innovation. These developments will pave the way for innovation and create new opportunities for the various sectors.

The accumulation of structured and unstructured data in institutional databases and social networks lends credence to the concept of **Big Data**. The challenge with this is that datasets become so vast that only with the emergence of new technologies can management of these data be possible. The huge datasets of information present considerable opportunities for valuable knowledge to be extracted using various data analytics tools. Enterprises and governments will be able to proactively manage people's needs by using these tools to offer new business models and capabilities that provide improved products and services to suit each individual's needs. Coupled with the escalation of consumption demand, the provision of on-demand software, services and infrastructure will gain traction as enterprises adopt **Cloud Computing** on a bigger scale. The elasticity and scalability of Cloud Computing will help organisations reduce costs and increase efficiencies through multi-tenancy. Individuals will also draw on personal clouds to store, share and manage their multimedia content and information.

The **Internet of Things (IoT)**, driven by the decreased price point of sensors, increased availability of low-cost network connections and new consumer demands will gain prevalence in the next 3-5 years. In IoT, a multitude of mobile devices, sensor networks and even household appliances are envisaged to be connected to an IP network which will enable data exchange between disparate devices to perform specific tasks. This will generate a significant amount of data, thus driving the need for data analytics techniques to make sense of these data. In **ICT and Sustainability**, the collective development of sensor network technologies and data analytics to monitor energy consumption and resource allocation through smart grids, smart transport systems and smart buildings aims to achieve ecological sustainability. At the same time, with devices communicating with one another across disparate platforms and networks, the capacity and resilience of communications networks become even more important. **Communications of the Future** will include a myriad of faster and higher-performance technologies like Long Term Evolution (LTE) and the potential use of TV spectrum whitespace or unlicensed spectrum.

Social media has carved out a new space in the cyber landscape in recent years, especially with the accessibility and reach through mobile channels. Sharing information at a rate faster than that of traditional mainstream media, social media encourages participation and engagement, and promotes transparency and accountability. It is increasingly used as the platform for community building, and businesses and governments are seeking to understand how to leverage social media to drive the **New Digital Economy (NDE)**. Also, coupled with the proliferation of mobile devices and e-commerce, the NDE provides a range of innovative business opportunities and models. For the government, the NDE enables a digitally connected citizenry where innovative ideas from the ground can be tapped to co-create a shared vision for the country. For small businesses, they are empowered with direct access to mass consumer markets and are able to forge more intimate

relationships with the customer. For individuals, collaborative consumption drives value-for-money purchases through demand aggregation and excess reduction.

Advances in manufacturing, design and nanotechnology are creating smaller and more powerful chips that can be embedded in handheld devices and sensors, spawning a new era of intelligence computing. Improvements in technologies related to **User Interface** of the Future will lead to a more seamless, interactive and immersive ICT user experience. Context-aware computing and artificial intelligence technology will continue to evolve, giving rise to a more ubiquitous ICT environment.

Finally, **Cyber Security** will remain a concern throughout the themes and will be an inhibitor to adoption for some of the technologies. However, the need to provide confidentiality, integrity, availability and protection will encourage innovation and provide opportunities for the development of new technologies and standards.

ICT will be critical in addressing challenges posed by an ageing population, rapid urbanisation and sustainability for the future. Understanding this ICT landscape allows us to remain agile and prepare for a future where technology touches our everyday lives. The ITR serves as a guide to build new capabilities, sustain our competitive edge and **co-create a future** for everyone.