- Executive Summary -

"Neural Business" – Enterprise ICT Applications for the Next Decade

……Following dinner discussions with a business colleague on "the next big thing", we agreed that I should write a short proposal summarizing my ideas for ICT plc. Looking beyond the Internet & Web2.0, we can see a diversity of trends including real-time business, embedded intelligence & networked 3D virtual reality. I've merged these dynamics within my core proposition of "Neural Business" as a hybrid business & technological model for the next 5 to 10 years.

***** Core Proposition –"Neural Business" *****

So now we come to the core "Neural Business" Proposition for the proposed work with ICT plc – Adaptive Enterprise Solutions. I've taken 9 of the major dynamic trends as the basis of the proposition that will transition the customers from their 20th C information business to the 21st C neural business.

Adaptive – Already a key component within ICT plc's Business Solutions and now ready to be integrated with further mission critical components of the "neural business" of the 21st Century.

Real-Time – Customers now demand real-time consummation of all their transactions, whilst businesses try to turn-over inventory in the theoretical "zero-time". We're now in the era in which ALL businesses should run themselves as if they're trading foreign exchange, bonds or futures.

Learning – Acquiring new semantic knowledge mapped over across the business operations, data warehouses, as well as processing event driven information alerts from intelligent data mining.

Organic – New styles of hybrid organization, modeled on the parallel overlays of neural networks as well as other biological metaphors, extending both hierarchical organization and peer-to-peer networking.

Self-Organizing – More advanced intelligent behavior in which the business and intelligent agents make their own decisions within boundaries pre-defined within profile limits set by human operators. Self-organisation works well in highly networked and connected environments, and underpins both positive and negative behaviours. Viruses and DDos Attacks may be self-organising, whilst viral networking & branding within social networks is also related to such behaviours. Self-Organisation underpins much biological behavior from the symmetry breaking instabilities within the womb, to the ant hill, and collective reproductive behaviours within certain single cell species.

Virtualization – Today this refers mainly to the outsourcing of storage, processing and networking to the enterprise cloud, and to 3rd party companies that may be located anywhere in the world. In this proposal, the meaning is extended to the virtualization of business itself, as well as domestic activities and decisions that may be virtualized to intelligent agents operating within simulated virtual worlds

Embedded Intelligence – Every node within the communications network, every gadget, human implant, software module, virtual and real world asset will have some embedded intelligence even if it is only an RFID device or virtual world ID Tag. Increasingly this intelligence will be pervasive, and nano-engineered devices will be embedded in every physical asset, and component within complex intelligent systems.

3D Virtual Reality – Today such interfaces are restricted to specific applications such as Multiplayer On-Line Games and applications such as Second Life. However, these 3D Interfaces will gradually take over for many future "neural business" applications since they provide interfaces that are easy to navigate for non-computer literate users. In fact with embedded nodal intelligence, the computer servers and storage will become a remote invisible utility, rather like the electrical power stations from the 19th/20th Centuries. Computers & Intelligence will simply merge and converge within the background business & domestic infrastructure that we'll connect to, primarily, with wireless, optical & laser communications at speeds of 100GBits up to 1TeraBit/Sec and beyond. This will power both business & domestic 3D "Next Generation Immersive Media Rooms with supporting hands-free sensory & body induced interfaces.

Knowledge Focus – The information explosion requires focus, and hence the use of the conceptual "Knowledge Lens" or "Decision Lens". We can conceive of time lenses and space lenses, as well as hybrid variations of space-time lenses. Focusing information in space is the traditional way of using a lens whilst the "Time Lens" focuses information as an event or time-defined process which may last from nano-seconds to years depending on the scope and complexity of the decision process Generally a time lens will involve data sourced from multiple environments and then consolidation for the short duration of the "decision process".

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Annex (1) – Frequently Asked Questions - FAQ

Why Neural Business? – We require a powerful metaphor that fully represents the requirement of the adaptive enterprise of the 21st Century. The biological neural brain is actually a hybrid adaptive organisation, with some significant redundancy of control that extends through the nervous system through the whole body, including sensory organs, and limbs. Enterprises today require a new model that allows them to manage the information explosion in ways that filter and focus the necessary information that need to be processed for quality decisions. In the future ICT products and services it should be understood that we're not trying to replicate the human brain, but simply to engineer some of its more useful features such as graceful degradation in the case of failure, redundancy of control & continuous and effective adaptation, self-organisation and learning within dynamic and often chaotic environments.

Business is already Real-Time – Businesses are certainly approaching real-time, but many mission critical business functions remain labour intense such as the management of financial spreadsheets and data mining. In a true real-time enterprise, most of these lower levels of operation will be managed autonomously within pre-set limits, and "human decision makers" will only be alerted with triggering events are go outside normal operating zones. Increased on-line competition will mean that *every* enterprise CIO will need to implement a strategic programme to transition to "real-time" operations within the next 5 to 10 years.

Are Decision Lenses just Vapourware? – Decisions Lenses are actually very real. Business today probably collect and store too much information and data, much of which may never be required. The human brain is more pragmatic and stores information and memories that are directly relevant to successful competitive adaptation and survival. In the same way, enterprises need to focus their terabytes of information in real-time to process and filter the necessary information for specific urgent management decisions.

Some argue that AI failed to deliver, so why the Semantic Web? – We're simply at the next stage of understanding how to model intelligence, using computing and software tools that were unavailable back in the 1970s and 1980s. It is imperative that we organise information in more structured ways such as our computing systems can themselves start to understand the semantic logic of knowledge.

Surely 3DVirtual Reality (3DVR) is just for Gamers! – Not at all! In fact several defence organisations in both the UK and USA are actively recruiting gamers in order to further develop simulated virtual worlds for more serious military objectives. These applications will soon extend to business & on-line shopping.

How does all this relate to Google? – It assumed by some that Google represents the future of Web2.0 and the Internet. Clearly Google has a strong market share, and excellent vision, but the vision of the "neural business" and "neural society" provides many other roles for emergent business that are not currently offered by Google Inc today. In particular, ICT plc can exert considerable leverage through its own brainpower and $3.6Billion R/D programme to explore some of the "Terra Incognita" within the emerging marketplaces for next generation adaptive business architectures.

Who else is offering Neural Business Solutions? – The leading players in this marketplace are the major suppliers of data mining and data warehouse solutions such as Business Objects and SAS Institute, as well as the major ICT Players such as Oracle, Microsoft and ICT plc itself. However, the solutions offered today are quite primitive software services and really represent early precursors of the solutions that ICT plc could engineer and launch during the coming 3 to 5 years. I believe that it is important to develop a compelling "story" regarding "neural business" architecture, benefits and services so that enterprise CIOs are confident in the next steps in their commitment to a multi-year investment plan.

Annex 2 – Professional Profile – Dr David E Probert – (*VAZA* International – www.*vaza*.com *)

During the last 30 years, David Probert has provided the strategic vision, thought leadership and in-depth technical knowledge for many successful projects including:

Computer Integrated Telephony (CIT) – Established and led British Telecom's £25M EIGER Project during the mid-1980s' to integrate computers with telephone switches (PABX's). This resulted in the successful development and launch of CIT software applications for telesales & telemarketing operations in a worldwide marketplace.

Blueprint for Business Communities – Visionary Programme for Digital Equipment Corporation during late-1980's that included the creation of the "knowledge lens" and "community networks". The Blueprint provided the strategic framework for Digital's Value-Added Networks Business that secured significant contracts for enterprise networks.

European Internet Business Group (EIBG) – Established and led Digital Equipment Corporation's European Internet Group for 5 years, from 1994 to 1999. Projects included support for the national Internet infrastructure for countries across EMEA as well as major enterprise, government & educational Intranet deployments. Dr David Probert was a member of the European Board for Academic and Research Networking (EARN/TERENA) for 7 years (1991 ➔1998)

Supersonic Car (ThrustSSC) – Worked with Richard Noble OBE, and the Mach One Club to set up and manage the 1st Multi-Media and e-Commerce Web-Site for the World's 1st Supersonic Car – ThrustSSC – for the World Speed Record.

Secure Wireless Networking – Business Director & VP for Madge Networks to establish a portfolio of innovative secure wireless Wi-Fi IEEE802.11 networking products with technology partners from both UK and Taiwan.

Networked Enterprise Security - Appointed as the New Products Director (CTO) to the Management Team of the Blick Group plc with overall responsibility for 55 professional engineers and a diverse portfolio of hi-tech security products.

Republic of Georgia – Senior Security Adviser – Appointed by the European Union to investigate and then to make recommendations on *all* aspects of IT security, physical security and BCP/DR relating to the Georgian Parliament.

Dr David E. Probert is a Fellow of the Royal Statistical Society. He has a 1st Class Honours Degree in Mathematics (Bristol University) & PhD from Cambridge University in Self-Organising Systems (Evolution of Stochastic Automata)

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