



- Smart Governance -

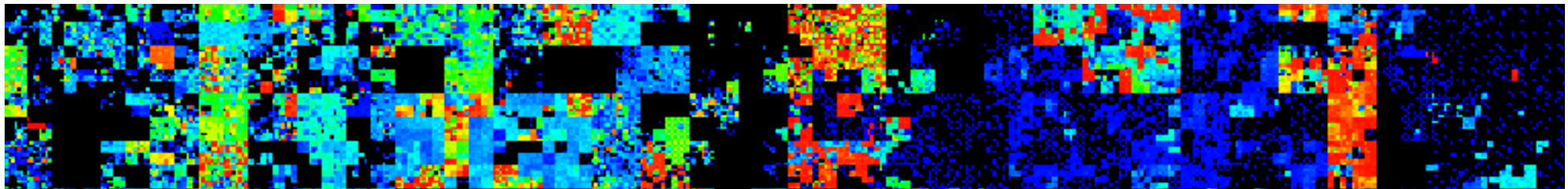
“Stimulating Innovation & Economic Growth”

Dr David E. Probert
VAZA International

Smart Governance for 21stC Armenia



1 – Background Review of eGovernance	2 – Basic Principles of Smart Governance	3 – From Academic Theory to Best Practice
4 - eGovernance Applications & Services	5 –Designing Smart Governance Solutions	6 – eGovernance Organisational Models
7 –Target Sectors for Smart Governance	8 – Competitive Benefits for Armenia	9 – RoadMap for Smart Governance



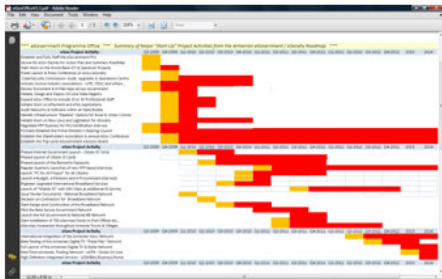
Background Review of e-Governance: *Armenia*

June 2009: *Developed Road Map for eGovernance & “Real-Time Armenia”*



“Roadmap for Real-Time Armenia”

**E-Government, E-Commerce and E-Security **



“Increasing Business Opportunities for the Armenian ICT Cluster through the development of E-Government, E-Commerce and E-Security”

**** Report Prepared by: Dr David E Probert – VAZA International ****

Executive Summary

a) MISSION: This final report summarises and documents the outcomes from my 21 day Mission to Armenia. The primary tasks, funded by USAID/CAPS Armenia were to support the Ministry of Economy in the further development of the National eGovernment RoadMap, as well as providing expert advice in the area of the proposed “Triple Play” Broadband Network, Cybersecurity, eGovernance, Public-Private Partnerships (PPP), ICT Vertical Clusters and e-Gov Interoperability Standards. During the course of this work, I conducted an extensive review of all previous materials including an analysis of the experience “Best Practices” of more than 20 other countries.

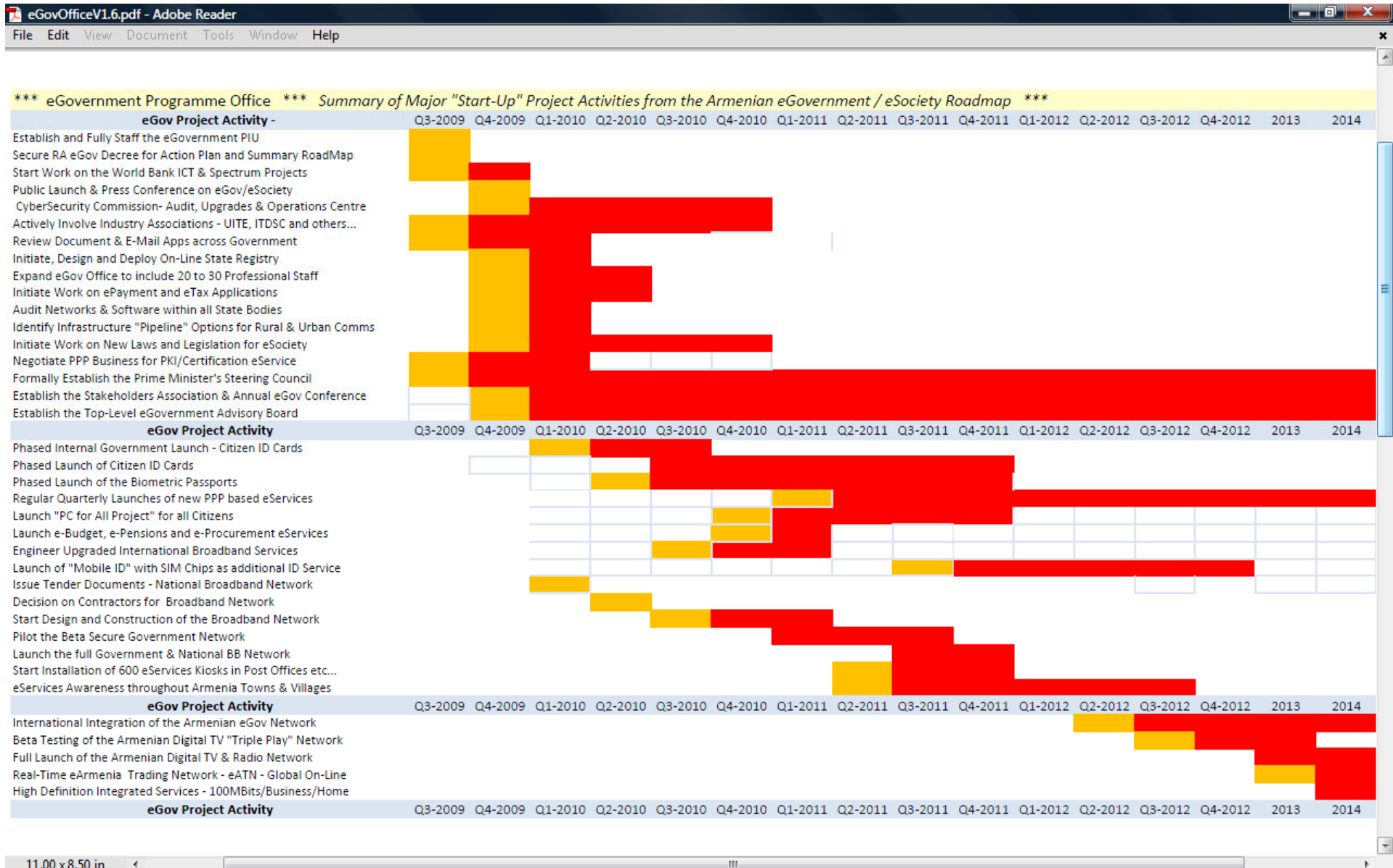
b) ANALYSIS: This work was challenging since it required the practical integration and prioritization of a diverse range of both partially funded and proposed projects. A key section within the report is the overall integrated 5 year eGovernment RoadMap and supporting Project Spreadsheet. The successful implementation of such a long term multi-dimensional programme will require the establishment of an eGovernment Programme Office with a full range of business & technical skills

Download Final Report @ www.caps.am/UserFiles/File/Real-Time-Armenia.pdf

Smart Governance: *Presentation Aims*

- Briefly Review the e-Governance Road Map – *June 2009*
 - *Proposed Applications, Organisation, Action-Plan*
- Discuss Current Trends in Smart Governance: *2009 to 2012*
 - *eGovernance Portals, Public Awareness, PPP, Standards & Compliance*
- Designing New eGovernance Applications and Services
 - *Smart ICT Solutions, Mobile “Apps”, 3D Mapping & Visualisation*
- Links with Smart Security and Smart Economy
 - *Embedded Cybersecurity Solutions, Learning & Adaptive Organisations*
- Competitive and Economic Benefits for 21stC Armenia
 - *Improved Lifestyles, Economic Growth, Cost-Benefit Analysis*
- ***In summary, we provide an update to the concepts, proposals and action plan from the published June 2009 eGov Road Map***

Summary eGovernance Road Map – 2009 to 2014

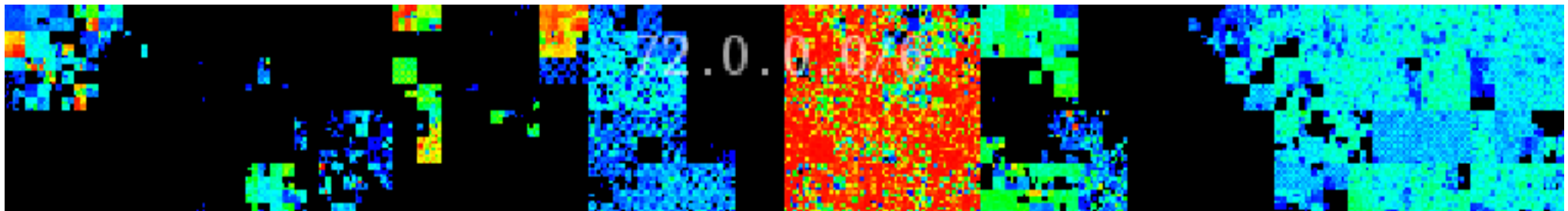


Download Presentation @ www.caps.am/UserFiles/File/Armenia-RoadMap.pdf

Smart Governance for 21stC Armenia

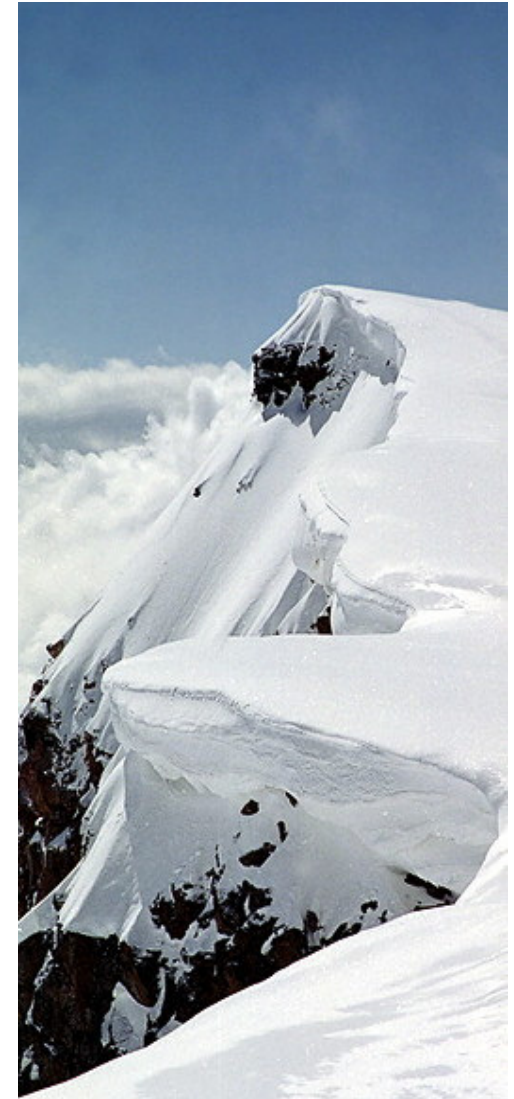


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Some *Principles* of Smart Governance

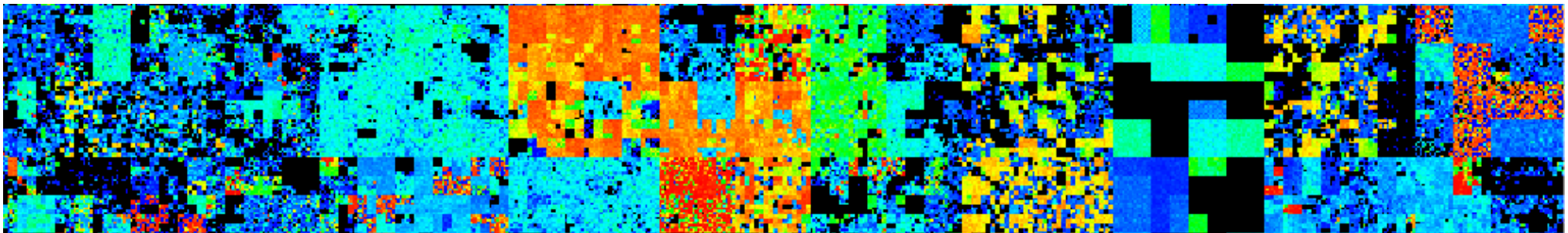
- 1) **Open Peer to Peer Network**
- 2) *Shared Risk and Shared Reward*
- 3) **Outsourced eServices as PPP Ventures**
- 4) *Embedded Cybersecurity Everywhere*
- 5) **Awareness, Education and Training**
- 6) *One Team – One Standard*
- 7) **Focused on Citizens & Business**
- 8) *Real-Time Project Management*
- 9) **Compelling On-Line Content**
- 10) *Always implement “Best Practice”*



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Smart ICT Systems: Summary of “Genes” and Technical Foundations

- **Theory:** In the “*Smart Economy*” Presentation we reviewed the theoretical & academic foundations of “Smart Systems”
- **eGov:** Smart Governance is an extension of eGovernance in which there is more intelligent on-line management, decisions and real-time adaptive control of eGovernment Applications & Services
- **“ICT Genes”:** The Smart ICT “Genes” remain the same as those for applications to the Smart Economy and Smart Security
- **Vendors:** Major Vendors such as Microsoft, CISCO, IBM and HP are all developing *Smart 21stC Architectures & Solutions*

...All Governments will transition to “Smart Management Principles” supported by Smart ICT Solutions during the coming 5 to 10 years

ICT “Genes” for Smart Systems

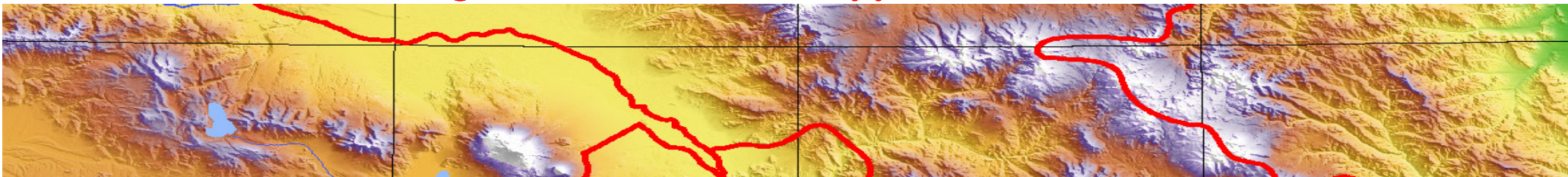
- Intelligent Systems, either Artificial or Organic are based on just a few shared common organising principles that include:
 - 1) **Space-Time Awareness:** Location (GPS) & Real-Time “Clocks”
 - 2) **Learning, Adaptation & Self-Organisation:** Real-Time Intelligence
 - 3) **Massive Memory & Storage:** Local & Remote Cloud Storage
 - 4) **Sustainable Security :** Embedded Smart Security – “Everywhere”!
 - 5) **Scalable Networked Architecture:** Smart Architectures will need to scale in space & time from micro cells to macro solutions
 - 6) **Decision Focus:** “Knowledge Lens” for Data Mining & “Big Data” from Social Networks, Search & On-Line Commerce
 - 7) **Systems Integration:** Cyber and Physical Solutions & Operations

.....Advanced ICT Solutions now provide ALL these “Genetic” Functions!

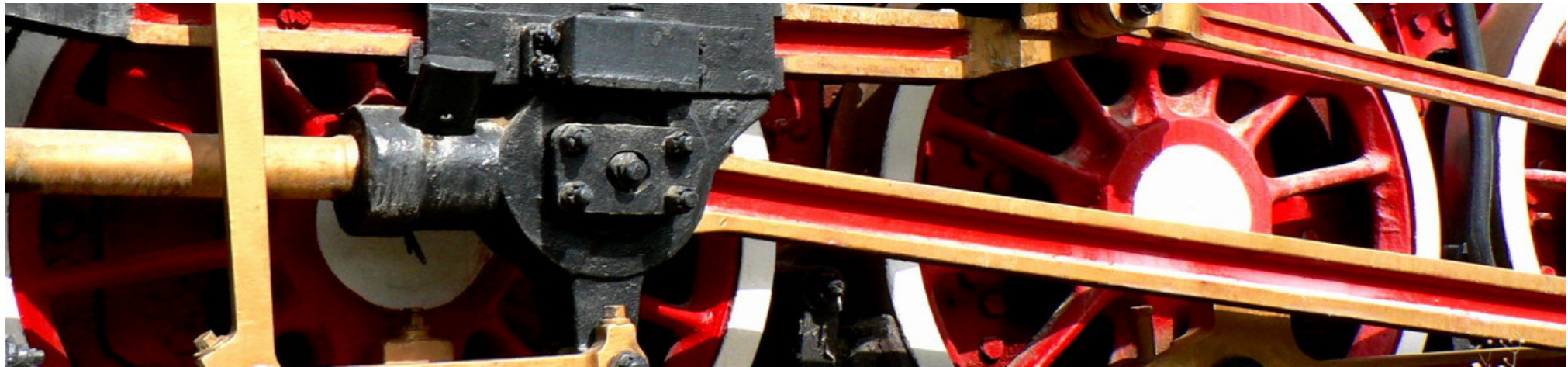
ICT Foundations for Smart Systems

- Smart Systems require a wide diversity of functions & features just like “living organic cells”. Advanced ICT now provides many existing and emerging smart options:
 - **Networks:** High-Speed Giga Byte Networking: Physical, Mobile & Wi-Fi
 - **Virtualisation:** Multi-Threaded Processors & System Virtualisation
 - **Massive Storage:** Internal, External & “Cloud” Storage, with Data Mining
 - **Semantic Web:** Led by W3C – “Smart Web” with linguistic understanding
 - **Cybersecurity:** Real-Time Security for O/S & Applications Software
 - **Architecture :** Scalable Architecture Solutions for Software Platform
 - **Interface:** Intelligent User Interface: Touch & Body Control
 - **Standards:** Conformance to International Standards (ISO/IEEE)
 - **Location:** Location Aware (GPS) & Environmental Sensors/Feedback
 - **Immersive Media:** Augmented Reality (AR) for Immersive Real/Virtual Worlds
 - **Social Media & Search:** Both are now generic global ICT service capabilities
 - **Smart Mobile Media:** At the heart of new Business Models & Architectures

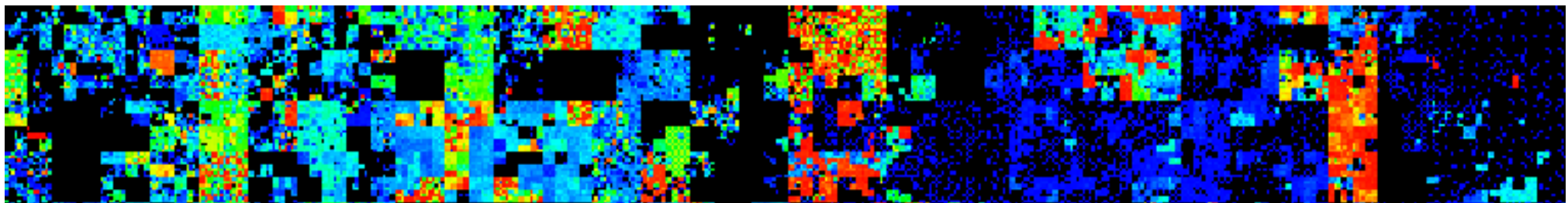
- **All these ICT Technologies will be used to support Smart Governance Solutions! -**



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Proposals for eGovernment Services (1)

*** "Proposals for e-Government, e-Commerce and e-Security Development in Armenia" ***		
Table 4.1 – Summary of eService Development Opportunities for PPP Ventures		
Government Organisation, Ministry and State Bodies	eService Development Opportunities - PPP	Suggested eGovernment Timescale and Priority
HealthCare	Personal Health Records, Appointments, Telemedicine	2011 – HIGH
Foreign Affairs	Visas, Passports, Embassies, Worldwide Diplomatic Service	2010 – HIGH
Economy	eGovernment Programme Unit, On-Line Economic Reports, e-Pensions, NASDAQ OMX	2010 – HIGH
Nature Protection-Environment	Nature Reserve Proposals, Hunting & Fishing Licences	2011 – LOW
Education & Science	Distance Learning, Multimedia Courses, Video Lectures	2011 – HIGH
Transport & Communications	Travel Details, Road Conditions and Closures, Communications Services & Operators	2011 – MED
Justice	On-Line Laws, e-Signatures, New Legislation for eServices	2010 – HIGH
Agriculture	Farming – Crop & Animal Prices, Weather, Planning Tools for Farmers, Resources	2012 – LOW
Finance	eBudgets, eTaxes, ePayments	2010 – HIGH
Energy & Natural Resources	Utilities, Mineral Exploration Licences, Geological Maps	2012 – LOW
Defense	CyberWarfare, CyberDefense, Integration of Physical and Virtual Defence Solutions	2010 – HIGH
Labour & Social Affairs	Welfare Payments, Social Benefits, ID Card Integration	2011 – MED

Author: Dr David E Probert : Final Report to USAID/CAPS : June 2009 : Page 20

*** "Proposals for e-Government, e-Commerce and e-Security Development in Armenia" ***

Urban Development	Planning Applications, 3D Plans, Architecture & Town & Village Development Plan Proposals	2012 – LOW
Diaspora	DiasporaNet – Web2.0 App, and migration to eATN (Armenian Trading Network)	2010 – HIGH
Emergency Situations	On-Line Alerts, Seismic, Nuclear, Storms, Floods, Fires, Action Alerts to Staff, Rescue Service – Crisis Co-ordination	2011 – HIGH
Sport & Youth Affairs	Services, Bookings, Events	2012 – LOW
Culture	Concerts Bookings, Events	2012 – MED
National Security Service	CyberSecurity Solutions, Protection against Attacks, Information Security-eGOV	2010 – HIGH
Republic of Armenia Police	Internal Domestic Passports, ID Cards, Driving Licences, Biometric Passports, On-Line Fines, Court Judgments, Criminal Records Database	2010 – HIGH
Nuclear Safety	On-Line Sensors, Leaks, Crisis Management Centre	2012 – MED
Real Estate Cadastre	Land Cadastre On-Line	2011 – MED
State Property Mgt	Asset Management – RFID	2011 – MED
State Revenue	Budget, Treasury Management, On-Line Investments, On-Line Tax & Customs Payments	2011 – HIGH
Civil Aviation	Airport Schedules, Bookings, ICAO Standards & Regulations	2011 – LOW
Central Bank of Armenia -TBD	Support for Citizen ID Cards and Biometric Passports - TBD	2010 – HIGH

Author: Dr David E Probert : Final Report to USAID/CAPS : June 2009 : Page 21

- Most of these eGovernment Service Proposals remain of high relevance in 2012 -

Proposals for eGovernment Services (2)

*** "Proposals for e-Government, e-Commerce and e-Security Development in Armenia" ***			*** "Proposals for e-Government, e-Commerce and e-Security Development in Armenia" ***		
Urban Development	Planning Applications, 3D Plans, Architecture & Town & Village Development Plan Proposals	2012 – LOW	Territorial Administration : 11 Armenian Districts + Karabakh Regional eServices, Hospitals, Schools, Social Welfare Portal		
Diaspora	DiasporaNet – Web2.0 App, and migration to eATN (Armenian Trading Network)	2010 – HIGH	Table 4.2 Common eService Development Opportunities for PPP Ventures		
Emergency Situations	On-Line Alerts, Seismic, Nuclear, Storms, Floods, Fires, Action Alerts to Staff, Rescue Service – Crisis Co-ordination	2011 – HIGH	Horizontal eServices	Description	Timescale and Priority
Sport & Youth Affairs	Services, Bookings, Events	2012 – LOW	ePayments	Option for ePayment for Government Taxes and Services, with secure Banking & Credit Card Gateways	2010 – HIGH
Culture	Concerts Bookings, Events	2012 – MED	State Registry of Citizens	Essential database for the operation of practically all eServices, especially ID Cards and Biometric Passports	2010 – HIGH
National Security Service	CyberSecurity Solutions, Protection against Attacks, Information Security-eGOV	2010 – HIGH	PKI Certification/Authentication and eSignatures Services	Scalable Solution Urgently required to support all transactional eServices	2010 – HIGH
Republic of Armenia Police	Internal Domestic Passports, ID Cards, Driving Licences, Biometric Passports, On-Line Fines, Court Judgments, Criminal Records Database	2010 – HIGH	GIS Land Mapping & Planning	Geographic Information Systems required for all Land Planning, Energy Utilities, Telecomms & Mobile Operators	2011 – MED
Nuclear Safety	On-Line Sensors, Leaks, Crisis Management Centre	2012 – MED	Citizen ID Cards/Passports	Top Priority in order to provide citizens with e-Identify	2010 – HIGH
Real Estate Cadastre	Land Cadastre On-Line	2011 – MED	Network Service Operations	Developed as an integral component of the new Secure Government & Public Broadband Networks	2010/2011 – MED
State Property Mgt	Asset Management – RFID	2011 – MED	CyberSecurity Centre/CERT - includes Pan-Government Business Continuity and Disaster Recovery Plans	All eGovernment eServices & Operations require embedded security in order to be trusted for on-line transactions.	2011 – MED
State Revenue	Budget, Treasury Management, On-Line Investments, On-Line Tax & Customs Payments	2011 – HIGH	Crisis Management Centre	Emergency Centre & Resources	2011 – MED
Civil Aviation	Airport Schedules, Bookings, ICAO Standards & Regulations	2011 – LOW	Government e-Library	Dynamic interactive search for on-line laws, decrees & guides.	2011 – MED
Central Bank of Armenia -TBD	Support for Citizen ID Cards and Biometric Passports - TBD	2010 – HIGH			

Author: Dr David E Probert : Final Report to USAID/CAPS : June 2009 : Page 21

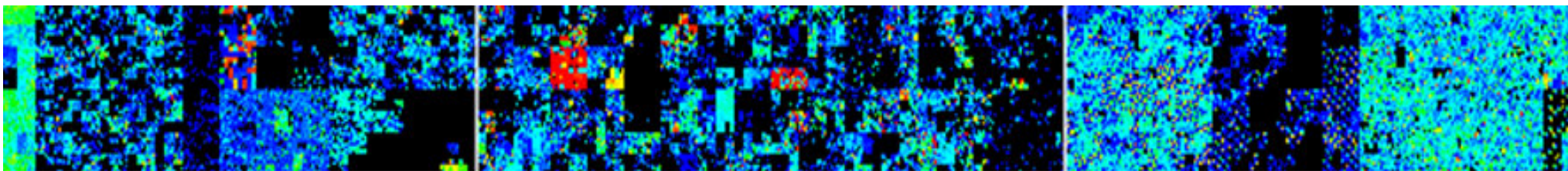
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- Smart Governance will require Interoperability Standards between eServices -

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Designing Smart Governance Solutions

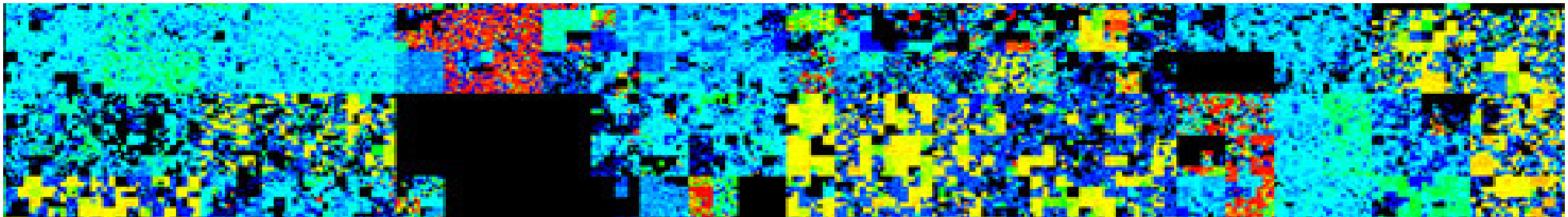
- Similar *Design Principles* apply to Smart Governance as to the design of Smart Solutions for Economic Sectors such as Banking, Healthcare, Social Welfare, Retail, Manufacturing, Tourism, Energy & Transportation
 - *Telemedicine* for Remote Armenian Communities is an excellent example to check-out the application of the “Smart ICT Genes”:
 - *Space-Time Awareness*: Require GPS Village Locations for Emergency Services
 - *Adaptation & Self-Organisation*: Adaptive Crisis Management: Staff & Resources
 - *Massive Memory & Storage*: On-Line Patient Medical & Drug Databases
 - *Sustainable Security*: Medical Data, and Mobile Assets need tight security
 - *Scalable Network Architecture*: On-Line Telemedicine Network to Span Armenia
 - *Decision Focus*: Medical Diagnosis & Treatment and often Time Critical
 - *Systems Integration*: Integrate & Optimise Physical and Cyber Medical Resources
- ...In summary, use “*Smart Genes*” as *Template to Design & Map ICT Solutions*



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eGovernance Organisational Models

- **eGov Programme Office:** Most advanced “Smart Governance” countries such as those in European Countries and Asia have a Central eGovernance Programme Office , often reporting to the Prime Minister’s Office
- **Smart eGov Organisation:** The eGovernment Office typically matures as an overall “Smart Governance” - CEO/CIO/CSO Organisation
- **PPP :** Successful eGov countries work to outsource Government eServices as PPP Business Ventures over multi-year cycle. The supporting secure network can be outsourced separately from the eService Applications
- **Prioritisation:** Government eServices should be prioritised and phased in according to their national importance & available project resources
- **Professional Skills:** eService Project Managers, PPP Tender & Bid Management, Standards, Interoperability, Architecture & Compliance, Cybersecurity Technical Specialists, Legal and Financial Support, Public Relations & Marketing Specialists

....In summary, every country requires a “Smart Governance” Organisation that is politically sensitive to traditional structures, Ministry & Agency relationships

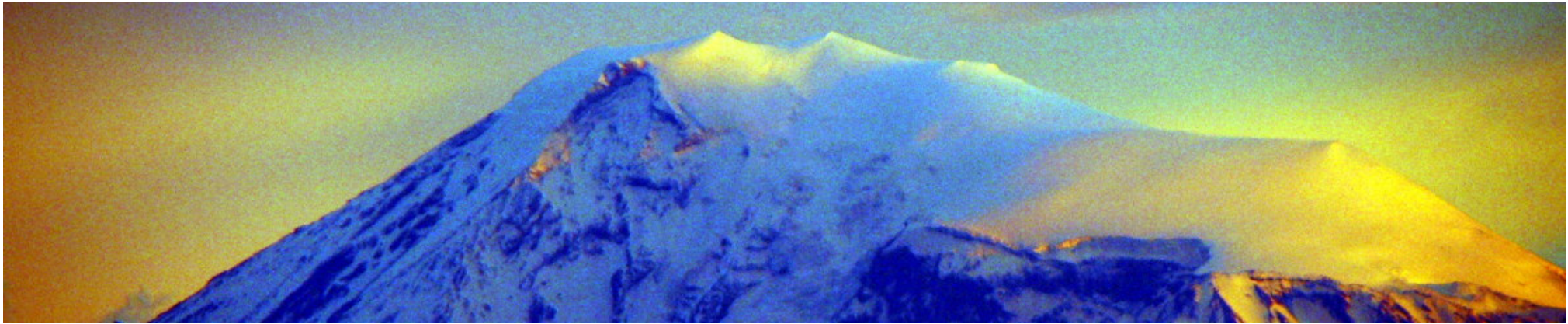
Smart Governance: *Programme Office*

Suggested Roles for a “Smart Governance” Programme Office:

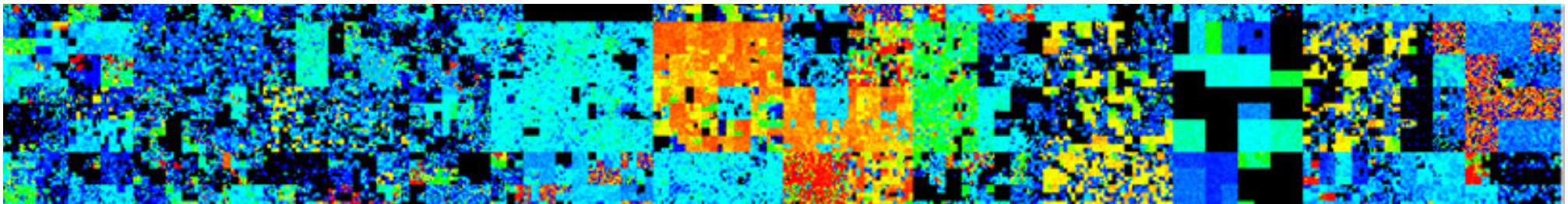
- New Venture Development and Management of new Government eServices
- Management of PPP Tender Documents, Review and Decisions,
- Working with EIF & TechnoParks, in the provision of specialised incubation support
- Liaison with Ministries and other State Bodies regarding eServices.
- On Going Policy Development for the National Armenian eSociety Programme
- On-Going Public Relations regarding PPP Tenders & eService Launches
- Establishing and communicating eGovernance Standards & Interoperability
- Primary responsibility for the establishment and operation of the Government PKI Certification and eSignature Generic Applications.
- Cross-Government Liaison with Ministry of Justice, National Assembly and others regarding new Legislation for eCommerce & Cyberspace.
- Management Support & Guidance with regards to the creation and launch of the public Government Web Portals for Citizens, and Business
- Primary co-ordination of eGovernance and eServices Awareness and Training Programmes with other Ministries, State Bodies and Regional Institutions.

....In summary, “Smart Governance” requires a degree of high-level management in order to ensure eServices Interoperability, Investment Funds, PPP Tenders & Secure Operations

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Target *Generic* Sectors for *Smart Governance*

- PPP Ventures for Generic eGovernment Services :
 - PKI/Certification/e-Signatures
 - *ePayments / eBanking*
 - eGovernance Web Portal Services
 - *GIS Land Mapping & Planning*
 - Citizen ID Cards and Biometric Passports
 - *Smart Network Service Operations*
 - Real-Time Cybersecurity as well as BCP/DR
 - *National & “Last-Mile” Broadband Infrastructure*
 - On-Line Crisis & Emergency Management Centre



Target *Vertical* Sectors for *Smart Governance*

- Possible PPP Style Ventures for Vertical Applications:
 - ***eHealthCare***: Personal Health Records, On-Line Appointments, Telemedicine, On-Line Pharmacies
 - ***eEducation & Sciences***: Distance Learning, MultiMedia Training Courses, Streamed Video Lectures
 - ***Real Estate Cadastre***: On-Line Planning integrated with National GIS/Cadastre System for Development
 - ***Diaspora Services***: DiasporaNet – Web2.0 applications migrating to eATN – Global Armenian Trading Network.
 - ***Regional Administration***: Portal for regional hospitals, schools, planning applications, travel info, social welfare

Using the 2009 eServices Framework, it is relatively easy to propose & design Vertical “Apps”. The really hard project work is to pull together a compelling PPP Business Plan, Investment and New Venture Consortium to roll-out eServices!...

- Smart Governance -

Interoperability Framework & Standards (1)

UK eGovernment Technical Standards Catalogue V6.2 (e-GIF) includes:

- ***Interconnection & Web Services:*** E-Mail Transport, e-Mail Security, DNS, FTP, Newsgroup, Real-Time Messaging Services, LAN/WAN Interworking, Encryption Algorithms, Signing, Key Transport, Hashing, Directory Services, Web Services
- ***Data Integration:*** Semantic Web Standards, RDF, OWL, UML, Data Transformation and Modelling, XML Signatures, Encryption, and Access Control, and XML PKI.
- ***Content Management – MetaData:*** Data Definition, Content Syndication, MetaData Harvesting, Distributed Searching (Z39.50), Content Sensitive Linking, Identifiers

- Smart Governance -

Interoperability Framework & Standards (2)

- ***E-Services Access:***

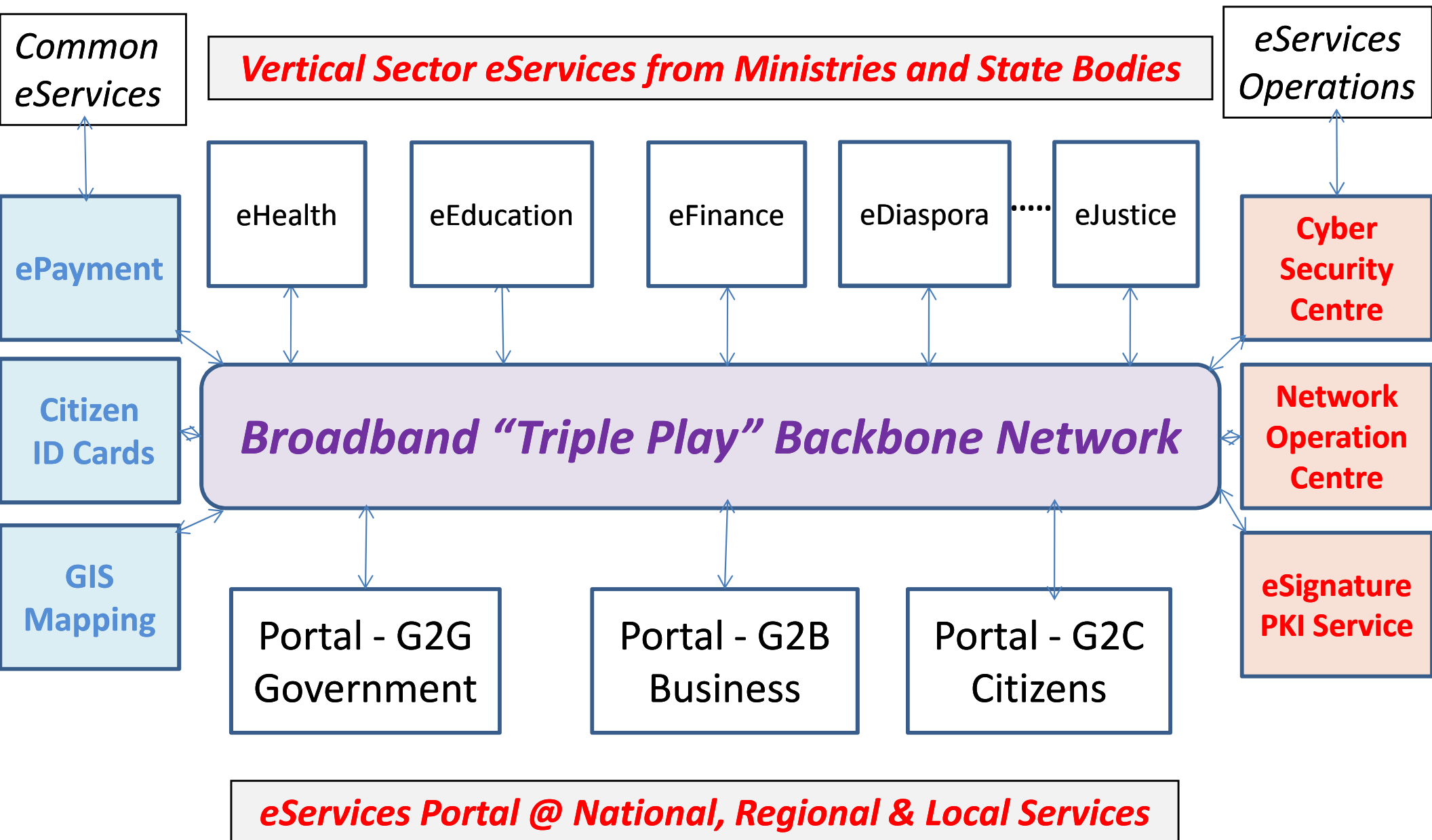
- Computer Workstations - includes all media types : images, animation, video, vector graphics, spreadsheets, presentations, scripting.
- Mobile Phones: WAP, GPRS, SMS, MMS
- IP Conferencing: Assembly, Audio, Video, Data, Control and Signalling
- VoIP: Gateway Control, Application Layer Signalling, Extended RTCP
- Smart Cards: Extensive Standards from ISO/IEC, including ISO 14443, and including - applications, electrical, physical, communications, & security.
- Biometrics : Biometric Data Exchange including fingerprints, facial image & iris scans, & also smart machine readable travel documents, passports

- ***Vertical Applications :***

- eLearning, eHealth and Social Care, eFinance, eCommerce, eProcurement , eLogistics , and Workflow Management .

*...Some Vertical Applications Sectors have their own International Standards, Guidelines and Regulations such as Air Transportation, Healthcare, Banking/Finance & Industrial Control. Other Related International Standards include: **ISO/IEC, W3C, IETF, ITU, ICAO, and EU/EIF.***

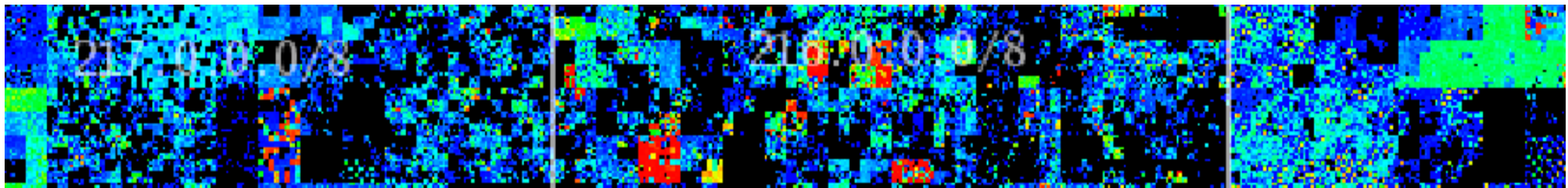
Generic eGovernance: *“Smart ICT Architecture”*



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Competitive & Economic Benefits for Armenia

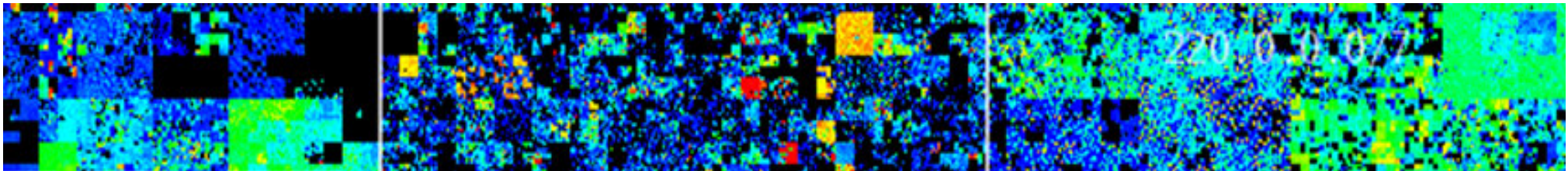
- **Armenia GDP:** Improved Economic Growth, GDP, particularly in ICT Market Sector.
- **ICT Cluster:** Increased Regional & International Competitiveness in the ICT Cluster, as well as market sector that transition & implement Smart ICT Solutions
- **Digital Divide:** Improved access levels to broadband services for citizens & businesses, and reduction in the “digital divide” between information rich & poor
- **Budget Spend:** Reduced Government Budget through the PPP outsourcing of Services, and corresponding overall improvements in Government Productivity
- **Citizen Lifestyles:** Improved Lifestyles, including Healthcare, Education & Social Welfare.
- **“Smart Armenia”** as a growing Regional & International Business Trade Hub Increased Regional & International Business & Political Isolation

...These are just a few examples of positive impacts of the managed transition to “Smart Governance” & “Smart Economy” for Armenian Business & Citizens

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Road Map for *Smart Governance*

- Some Key Smart Governance Steps that both include & update the previous actions from the 2009 eGov Road Map:
 - **ICT Nets:** Enhance the National Broadband “Triple-Play” ICT Infrastructure
 - **Cybersecurity:** Improve “Smart Security” (Physical & Cybersecurity) for Government, Critical National Information Infrastructure & Major Enterprises
 - **PPP Ventures:** Establish further PPP style business ventures for new eServices
 - **TechnoParks:** Continue to support the incubation of “Smart Solution” Ventures that may be mentored & hosted in TechnoParks in Yerevan and Gyumri
 - **Smart Skills:** Work with Armenian Business, Colleges and Universities to train-up a new generation of graduate students in advanced ICT Smart Solutions
 - **Diaspora:** Encourage Armenian Diaspora to invest & support “Smart Armenia
 - **Economy:** Establish Government-Business Team to promote “Smart Economy”

“Smart Governance” for 21stC Armenia!

21stC Armenia : “Smart Governance”

DigiTec Business Forum – Yerevan, Armenia

Thank-You!...

Presentation Slides:

www.Valentina.net/DigiTec2012/

Presentation Slides:

www.Valentina.net/DigiTec2012/



Thank you for your time!

Professional Profile – *Dr David E. Probert*

- **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
- **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
- **European Internet Business Group (EIBG)** – Established and led Digital Equipment Corporation's European Internet Group for 5 years. 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 sponsoring member of the European Board for Academic & 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 fully 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 & 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.
- **UN/ITU** – Senior Adviser – Development of Cybersecurity Infrastructure, Standards, Policies, & Organisations in countries within both Europe & Americas

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) , and his full professional biography is featured in the Marquis Directory of Who's Who in the World: 2007-2012 Editions.

21stC Armenia : “Smart Governance”

DigiTec Business Forum – Yerevan, Armenia



BACK-UP SLIDES

