

# Smart Solutions: “Master Class” – Part 2



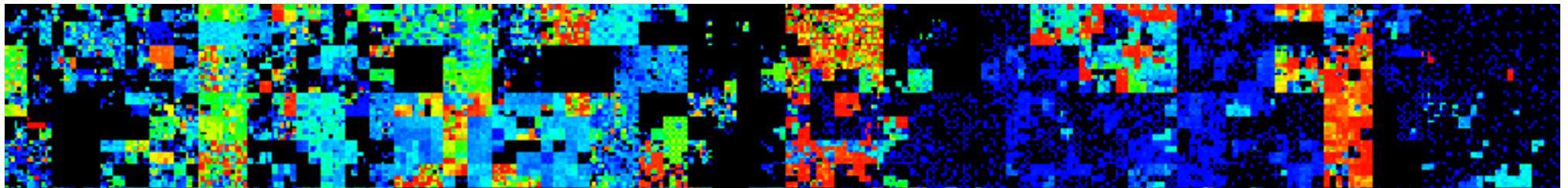
## - Smart Solutions in Practice for 21<sup>st</sup>C Armenia -

Dr David E. Probert  
VAZA International

# Smart Solutions in Practice for 21<sup>st</sup>C Armenia



<b>1 – Review Principles of Smart Solutions</b>	<b>2 – Transition to Smart Economic Sectors</b>	<b>3 – Banking &amp; Finance</b>
<b>4 – Education &amp; Research</b>	<b>5 – ICT, Mobile &amp; Telecommunications</b>	<b>6 – Travel , Tourism &amp; Transportation</b>
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# Basic Principles of Smart Solutions

- In Part 1 we provided some background theory and basic principles for Smart Systems which we summarise here:

.....*Smart Solutions typically possess the following features:*

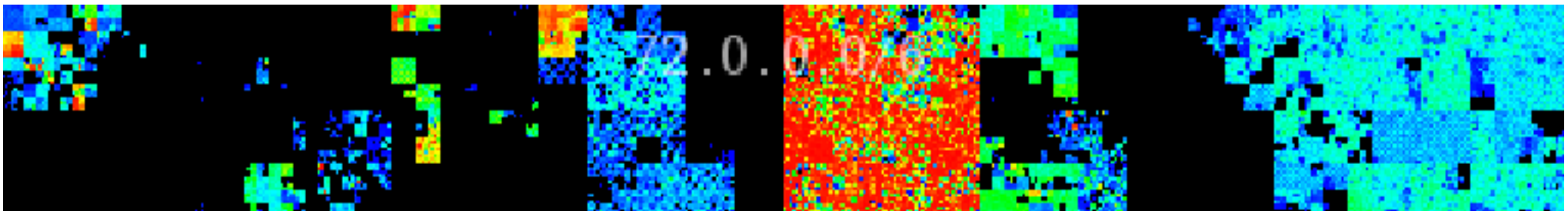
- 1) **Space-Time Awareness:** Location (GPS) & Real-Time Clocks
- 2) **Learning, Adaptation & Self-Organisation:** Real-Time Intelligence
- 3) **Massive Memory & Storage:** Local & Remote Cloud Storage
- 4) **Sustainable Security :** Embedded Smart Security – *Everywhere!*
- 5) **Scalable Networked 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

.....*Now we'll consider the practical applications of these principles on the more important economic market sectors for 21<sup>st</sup>C Armenia!*

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# *Transition to Smart Economic Sectors*

- In this initial Master Class we'll apply the practical “Smart Design Principles” to just a selection of economic sectors:
  - 1) *Banking and Finance*
  - 2) *Education and Research*
  - 3) *ICT, Mobile and Telecommunications*
  - 4) *Travel, Tourism and Transportation*
  - 5) *Healthcare and Social Welfare*
  - 6) *Retail and Distribution*
- You'll then be able to easily extend the “Smart Principles” to the other key sectors within Armenian Economy such as Agriculture, Manufacturing, Entertainment & Leisure

# Smart Solutions – *“Design Toolkit”*

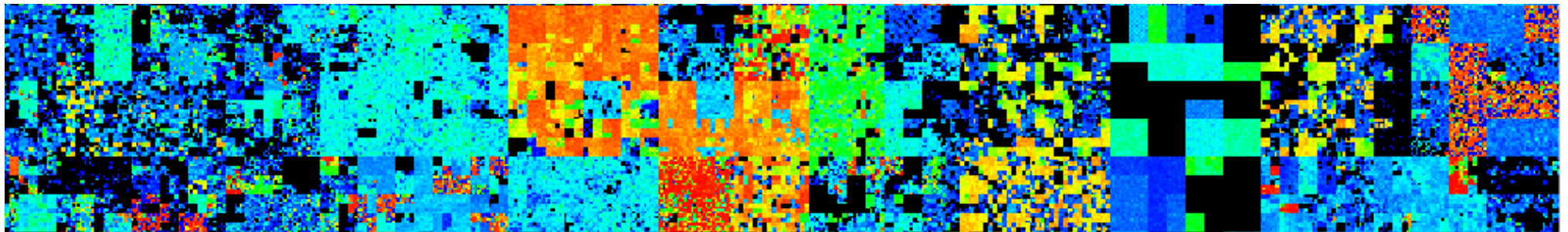
- The main idea of “Master Class” Part 2 is now to apply the Smart Decision and Learning “Genes” as the transition design tools for selected economic sectors:
  - **Smart Decision “D-Genes”** : Spatial Geo-Location, Real-Time Operations, & Transforming Data to Decision through the “Knowledge Lens”!
  - **Smart Learning “L-Genes”**: Adaptation, Self-Organisation, Scalable Architecture and Massive Memory & Data Storage
  - **Smart Resilient Security**: Joint Operations for Cyber & Physical Security
  - **Smart Integrated Governance**: On-Line eGovernment Services together with new Laws for Cybercrime, eCommerce & Info Privacy

*.....Together these Smart Principles form a simple “Design Toolkit”!*

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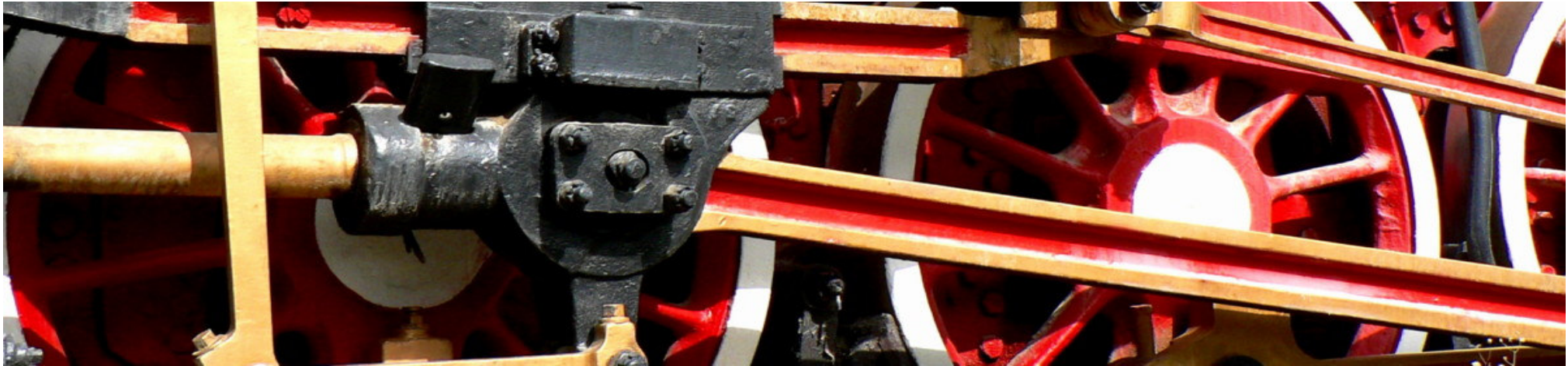
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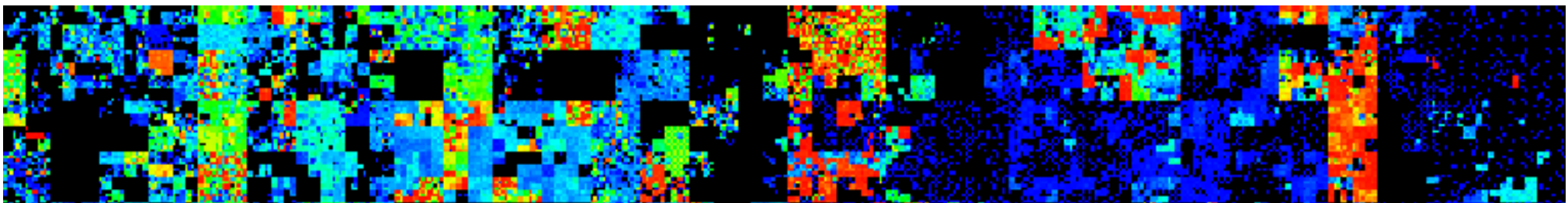
# “Smart Solutions” - *Banking and Finance*

- For each economic sector we'll begin by analysing each of the Smart Design Principles – Decision, Learning, Security & Governance:
  - **Smart Decisions:**
    - *Geo-Location:* Smart Mobile Banking, with GPS Location to provide suggestions for shopping (based on profile), cafes, restaurants, nearby on-line friends...
    - *Real-Time:* Financial & Commodity Trading, on-line share dealing, maximise interest rates, foreign exchange dealing. Banking has really pioneered “real-time” financial trading & networking during last 30 years!
    - *Knowledge Lens:* Deep Data Mining, Business Intelligence2.0 and CRM (Customer Relationship Management for Banking & Investment Clients)
  - **Smart Learning:**
    - *Adaptation & Self-Organisation:* Investment Banks have pioneered applications of Smart Neural Network Apps, Adaptive Trading and Real-Time Risk Management.
    - *Massive Memory & Storage:* Secure Resilient Databases are Fundamental to Banking
    - *Scalable Architecture:* Banks are moving from “bricks & mortar” to global scalable networks, and most now provide mobile banking “apps” and on-line account services
  - **Smart Security:** Encryption, Portable Pin Pads, Biometrics, Cyber Risk Management
  - **Smart Governance:** Data Integrity, Compliance & Audit, New Financial Regulations

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# “Smart Solutions” - *Education & Research*

## – **Smart Decisions:**

- *Geo-Location:* Mobile Education, Navigation & Mapping, Augmented & Immersive Reality based on Geo-Location with Mobile Devices & Headsets
- *Real-Time:* Networked Laboratories for Synchronised Parallel Research in Genetics, High-Energy Physics, Optical & Radio-Astronomy
- *Knowledge Lens:* Smart Grid Computing with In-Depth Data Mining in search for New Particles in CERN LHC Collider.

## – **Smart Learning:**

- *Adaptation & Self-Organisation:* Virtual On-Line Colleges for remote students. Collaborative academic & commercial Techno Parks & Labs
- *Massive Memory & Storage:* Crowd Sourced Volunteer PC Research as in the SETI Project (BOINC – Berkeley Open Net Computing)
- *Scalable Architecture:* Business Opportunities for Global Niche College for minority study & research themes. Study courses on mobile “apps”!

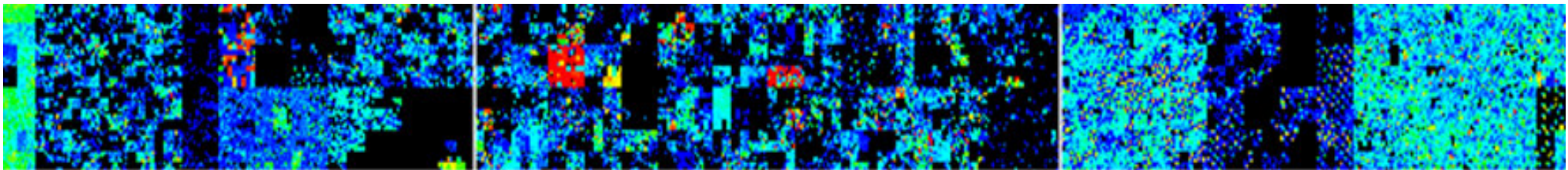
## – **Smart Security:** College Campus & Laboratory Cyber & Physical Security

## – **Smart Governance:** Rigorous Educational Data Audit & Compliance Regime

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# “Smart Solutions” - *ICT, Mobile & Telecommunications*

## – **Smart Decisions:**

- *Geo-Location:* Local Mobile Information – Maps, Satellite Imagery, Climate, Geology, History, On-Line Persons on Smart Devices.
- *Real-Time:* Financial Transactions, ePayments, eGovernment Services, IM, Social Media, MMORG and Immersive Virtual Worlds
- *Knowledge Lens:* Global Data & Information can be filtered and focused for Local Decisions with ICT enabled “Knowledge Lens”

## – **Smart Learning:**

- *Adaptation & Self-Organisation:* Mobile, Wireless & Cellular Ad-Hoc Networks use adaptive routing & roaming protocols
- *Massive Memory & Storage:* ICT provides the essential Smart Storage & Processing Tools including System Virtualisation & Cloud Computing
- *Scalable Architecture:* Fundamental for smart ICT systems that already scale from nano machines to global search & social media “apps”

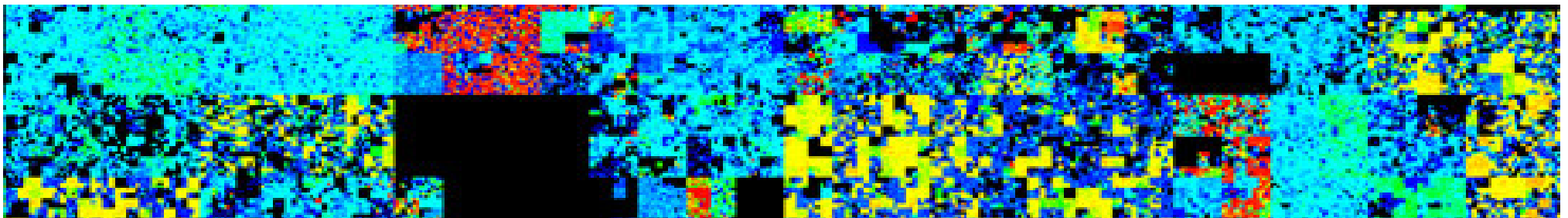
## – **Smart Security:** Cybersecurity needs to be embedded EVERYWHERE!

## – **Smart Governance:** ICT requires new laws, regulations & governance

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# “Smart Solutions” - *Travel, Tourism & Transportation*

## – **Smart Decisions:**

- *Geo-Location:* Provide tourists & travellers with on-line navigation & local information on sites, events, routes, hotels, shops & cafes.
- *Real-Time:* Trip Planners & Travellers require on-line reservations, room & airline availability, price comparisons all in “real-time”.
- *Knowledge Lens:* Provide customised trip & travel agendas for both tourists and business travellers, based upon on-line profiles & needs

## – **Smart Learning:**

- *Adaptation & Self-Organisation:* Continuous adaptation to regional and global travel market trends - Focus on conferences & events.
- *Massive Memory & Storage:* Model & tourist & business travel schedules, locations, routes, preferences & profiles for data mining
- *Scalable Architecture:* Develop & promote scalable tourism plans for individuals, adventure & cultural tourism groups for Armenia & Region

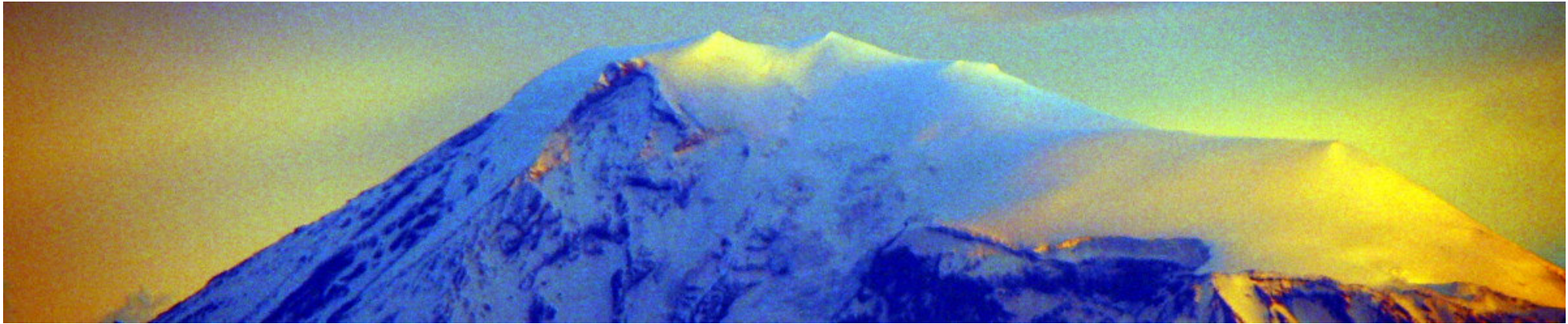
## – **Smart Security:** Tourists require secure & safe travel to Caucasus Countries

## – **Smart Governance:** Travel & Tourism requires Regulations, Standards & Audit

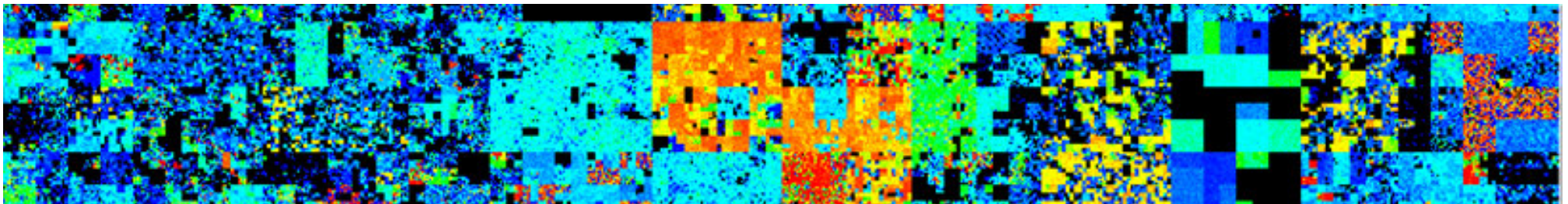
# Awesome Armenian Travel & Tourism!



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# “Smart Solutions” – *Healthcare & Social Welfare*

## – **Smart Decisions:**

- *Geo-Location:* GPS Location for Medical Emergencies, Patient Images, Crisis Management, Ambulance Routing, Regional Social Support
- *Real-Time:* On-Line Telemedicine Consultation & Preliminary Diagnosis. Also Smart Support during Intensive Hospital Surgery
- *Knowledge Lens:* Filtering & Analysing Complex 3D Medical Scan Images, as well as future Data Mining for On-Line Patient Records

## – **Smart Learning:**

- *Adaptation & Self-Organisation:* Challenging Medical Research in New Treatments for Cancer & Neural Diseases through Global Partnerships
- *Massive Memory & Storage:* Design, Analysis and extensive Patient Trials of New Pharmaceutical Drugs, including new “Smart Drugs”
- *Scalable Architecture:* National professional support network for both social welfare as well as citizen health, diagnosis and treatments

## – **Smart Security:** Cybersecurity & Personal Privacy for Patient Records, as well as integrated security for hospitals, medical assets, drugs & social welfare facilities

## – **Smart Governance:** Professional Government Support, Management & Funding for National Medical & Social Welfare Services

# “Smart Solutions” – *National Security & Defence*

## – *Smart Decisions:*

- *Geo-Location:* For Civil Police & Military Security Assets, National Defence, Trans-Border Intelligence, Satellite Imagery & Mapping
- *Real-Time:* Command & Control (C4ISR) for Civil Disturbance & Crisis and Regional Military Conflict, Virtual War Operations Room
- *Knowledge Lens:* Filtering through real-time multimedia raw intelligence, images, audio, video to make informed decisions

## – *Smart Learning:*

- *Adaptation & Self-Organisation:* Hybrid Adaptive Organisation with Hierarchical C&C Coupled with networked cellular field operations
- *Massive Memory & Storage:* Historical and Current National & Regional Intelligence, Alert & Security Database & Operations Net
- *Scalable Architecture:* Resilient and Flexible Cellular C&C Network spanning all defence & military facilities and security assets

## – *Smart Security:* Essential integrated security for the integrity & protection of Armenian Population, Government, Business & Financial Assets

## – *Smart Governance:* 21<sup>st</sup>C State of the Art **C4ISR** – Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance

# “Smart Solutions” – *Retail & Distribution*

## – **Smart Decisions:**

- *Geo-Location:* Use Mobile GPS & Wi-Fi combined with social media profiles to promote retail outlets, consumer brands & services
- *Real-Time:* On-Line eCommerce with 3D immersive Retail Malls, linked secure payments (PayPal), “Zero Stock” Warehouses
- *Knowledge Lens:* Data Mining & Business Intelligence from CRM Data Warehouses based upon consumer buying profiles & history

## – **Smart Learning:**

- *Adaptation & Self-Organisation:* Tracking & Adapting to Consumer & Business trends (B2C & B2B), as well to issues with logistics networks
- *Massive Memory & Storage:* Storing & analysing consumer data obtained from “checkouts”, personal profiles, preferences, & surveys
- *Scalable Architecture:* Establish integrated physical and on-line retail shops & distribution networks with good trading margins & optimised “cost of sales”

## – **Smart Security:** Secure business info from cyber risks, financial fraud, theft of consumer data, and that physical premises are fully monitored with alarms & CCTV

## – **Smart Governance:** Integrate financial & sales operations, and schedule regular self compliance audits to minimise stock theft or financial manipulations.

# “Smart Solutions” – *Energy & Utilities*

## – *Smart Decisions:*

- *Geo-Location:* Managing & optimised local energy & utility needs within homes, apartments, offices, factories and public buildings.
- *Real-Time:* Ensuring that key power plants & utilities, such as water supply, can meet regional requirements second-by-second.
- *Knowledge Lens:* Forecasting future demand for oil, gas, electricity and water based upon historical usage & forecast economic growth/decline

## – *Smart Learning:*

- *Adaptation & Self-Organisation:* Adapting to local, regional & national energy demand through dynamic management control systems
- *Massive Memory & Storage:* Consumer & Business Billing & Payment Databases
- *Scalable Architecture:* Energy Grids are also scalable networks from local pipes and cables to the central coal, oil or nuclear plant

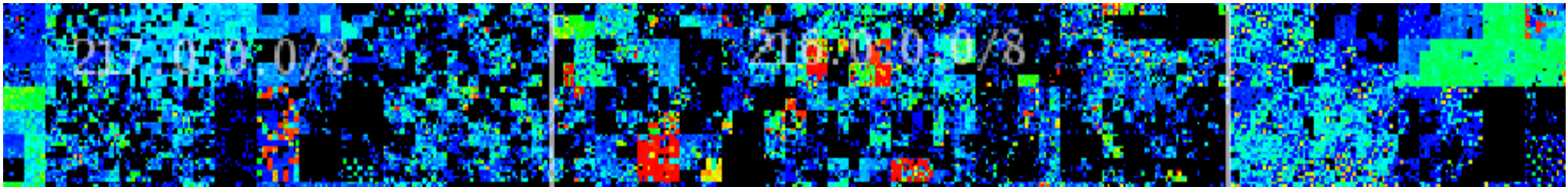
## – *Smart Security:* Resilience to cyber attacks to SCADA control systems by sophisticated trojans such as Stuxnet, as well as physical plant protection

## – *Smart Governance:* Regular physical inspections & audits to minimise risks from major incident such as power shutdown, radiation, chemical or water leaks

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# Road Mapping the “Smart Economy”

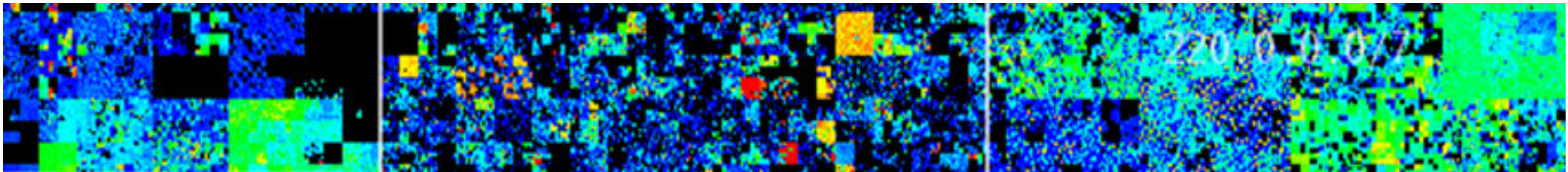
- **Scope:** The overall “Smart Economy” comprises the underlying Economic Sectors together with Governance & Security
- **Plans:** Transitioning to the “Smart Economy” requires a National Programme to co-ordinate & synchronise the multiple economic initiatives and joint PPP ventures. Key Programme steps are:
  - Establish small Programme Office – PPP – *Government & Business*
  - Negotiate, Communicate & Launch 3 to 5 year “Smart” Road Map
  - Facilitate development of Enhanced National ICT Infrastructure
  - Work with Government Ministries & Agencies on Smart Projects
  - Encourage investment in new Techno Park “Smart” Ventures
  - Support College Training Courses, BSc, MSc, MBA in “Smart” Topics
  - Work with “*Diaspora*” for synchronised trans-national programme

***...In summary, establish a Government-Business Partnership and leverage Armenia’s excellent ICT skills as the catalyst to promote “Smart Solutions”***

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# Next Steps for 21<sup>st</sup>C “Smart Armenia”

- In “Master Class” - Parts 1 and 2 - we’ve worked through some Theory, Principles & Practice of “Smart Solutions”:
  - **“Smart Armenia”** could act as the economic catalyst towards a new strategic vision & national mission for sustained growth & market competitiveness in global export markets
  - **“YOU”** - The next steps are up to YOU! – In Part 3 it is suggested that small teams develop & present outline project plans for the application of ICT based “Smart Solutions” to key market sectors
  - **“Smart Programme Office”** – A further step is then to establish a small programme office to take the discussions & proposals from DigiTec 2012 Business Forum forward to concrete investment plans

***...So start planning your transition to “Smart Economy” now!***

# “Smart Solutions in Practice”

DigiTec Business Forum – Yerevan, Armenia

**Thank-You!...**

**Master Class Materials & Slides:**  
***[www.Valentina.net/DigiTec2012/](http://www.Valentina.net/DigiTec2012/)***

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Thank you for your time!

# 21<sup>st</sup>C Armenia : “Smart Economy”

DigiTec Business Forum – Yerevan, Armenia



## BACK-UP SLIDES

