INDUSTRY PERSPECTIVES ON IGS
COLLABORATION, IMPACT AND INFLUENCE – PAST, PRESENT AND FUTURE

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Introduction

- IGS Collaboration - Impact and Influence
- The PAST
  - the PRESENT and
  - the FUTURE

An Industry Perspective
Interaction with Industry has had successes:
- Survey - Large geodetic frameworks used Data & Products.
- Aviation - Meteorological applications and uses.
- Telecoms - The Timing Community and it’s needs.

The IGS did not initially target Industry.
- Technical Parameters whereas Industry needs were different

Supply, Use and Interaction rather than Collaboration
The IGS Influenced Industry

- **1989:** Edinburgh, IAG congress. The concept that fiducial sites could control large geodetic networks for inter-continental schemes was first appreciated.
- **1990-1993:** For Control Sites in Geodetic campaigns we had to visit VLBI/SLR sites e.g. Unsala, Wettzell, Matera etc. A costly and time consuming process.
- **1994-2003:** The introduction of Services (Data & PE) enabled the International campaigns to be undertaken much more cost effectively.
- **2000+:** Use and agreements with Members for the supply of services and products. The move to Real-Time services.
Common Influencing Factors

- 1990’s: Improved access to Dual Frequency GPS with affordable receivers and antennas.
- 1990’s: The Internet.
- 2003: Galileo gets approved (by Europe).
What has Been Significant?

- For Industry, the ability to develop regional augmentation systems on the basis of precise reference frameworks.
- The IGS created a market for high precision Products.
  - Reliance upon such products increased.
  - Organisations now try to offer a local capability.
- The IGS have demonstrated the deliverables are sustainable.

The above offered opportunities for Industry

- Developments in hardware and systems.
- Increased development, acceptance and use of high accuracy solutions.
The PRESENT

- Increased use of the Bernese software product.
- Real Time High Accuracy services adopting Global Error Modelling (Wide Area) techniques.
- Galileo continues to offer new experiences.
- Bilateral Service Level Agreements in place between Members and Industry becoming more common.
- Applications - Subsidence Monitoring - a Partnership between Industry and IGS members (Academia).

Overall the real collaboration is relatively small
INDUSTRY – The Requirements

Example:
Deep Sea survey & exploration using Autonomous vehicles

- Initialisation for alignment, attitude as well as 3D/4D position.
- Annually 1-5mm over 5-10+ years
- Availability – When the AUV surfaces.
- Integrity, Reliability and Continuity of Service – Through QC.
- Customer Service and Support.
- New GNSS?
## The IGS Value Chain

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<th>PRODUCT</th>
<th>COMMS</th>
<th>REAL TIME</th>
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IGS – The FUTURE

- **The IGS Data, Products and Services**
  - Data - could Real Time systems replace the need?
  - Products - continue to be used but will performance be accepted without clear QC?
  - Services - is the IGS Scientific or Commercial?
    - E.g. How will the station coverage continue to grow and why?

- **Industry could collaborate**
  - What are the reasons this may or may not happen and how does the IGS influence this?
  - Issues of Real Time, Communications & Service Levels

- **Collaboration would be “win win”**.
Consider Sites - 1998: Operational ‘Hot Spots’

Scintillation
Severe Disturbance
Severe Disturbance
Geomagnetic Boundaries
Geomagnetic Equator
Consider Sites 2003: Site Selection Strategy

- Where is the infill in the Tropical regions?
- Are the Costs versus Benefits acceptable?
- Reliability and quality must be preserved.
- Can the IGS maintain this?
- The Influence of Galileo?
The FUTURE....

- The IGS could review how it is structured and formed as a legal or contractual entity.
- Is Funding secure?
- A clear strategy would allow Industry to understand the direction the IGS is taking.
  - E.g. Is site selection based upon a collective (IGS) need or a member funding capability?
- Alternative collaborations could be investigated
  - The World Meteorological Organisation (WMO) or another UN or Non Government Organisation (NGO).
- The arrival of Galileo should introduce some new elements to the situation:
  - New Sites, Observation selection and the reduced need for Data
FACTORS INFLUENCING IGS & INDUSTRY

The IGS function
• Recognised
• Included
• Expanded
• Accepted

Industry View
• Added complications
• Value not clear
Future Collaboration

- The IGS or its Members could encourage Industry to support the introduction of new sites.
- New GNSS systems shall impact on both IGS & Industry.
  - By collaboration and communication, duplication of effort can be avoided.
- Industry accept that there is no contract for current activities however for future needs an alternative source may be created.
The IGS Future

- Continue to Monitor & update co-ordinate frameworks.
- New generations will require Training:
  - the significance of dynamic earth models and Epoch based Datums.
- For new GNSS systems the IGS will be involved in ensuring they are “honest”.
- The IGS still has work to do – Atmospherics, Galileo
- Active collaboration via ownership
  - Acts under an umbrella organisation - The IAG, the World Meteorological Organisation (WMO) or another UN, or Non Government Organisation (NGO). Does GEO fit this?
- IGS to provide a Single Source for information
  - Papers, Practical Knowledge, Distance Learning Modules, QC, Research
The IGS has developed a robust and well respected series of data and product services. Industry has been slow to appreciate their importance and build upon the work. It’s improving. Galileo may, by design, offer solutions compatible with future Real-Time Industry needs. The Scientific research will still be required for atmospherics, timing and geodesy. Without a clear strategy and an ability to form a contract, Industry will remain, at best, slow on the uptake, at worst, competitors. The IGS can remove the threat and strengthen its position with a slight shift in emphasis.
To Conclude

Wm. Shakespeare’s Henry IV stated:

“Past and to come seems best; things present, worst”

But the IGS is not at it’s worst so....

The IGS will have a strong 10 years ahead.