

# Intergraph SMART Solutions

The next step of innovative, wider and integrated geospatial infrastructures

## **LAIGINHAS, Carlos**

Intergraph, exploring its position on the Hexagon Group context and its rich and diverse range of industry leading platforms and know-how, have embraced the challenge of evolving from the concept of Spatial Data Infrastructures (SDI) to far-reaching solutions, capable of responding to a more critical, demanding and varied range of essential needs. Taking advantage of the best experiences with SDI in government use cases we have expanded the concept, including branches to other complementary domains, scopes and objectives like emergency planning and response, critical assets managements, security surveillance, infrastructures management and public works monitoring, environmental and energetic improvements, amongst others.

These are Intergraph SMART Solutions and they can be applied and explored in a tailored fashion in several situations, since a SMART City to a SMART Industry, passing by SMART Infrastructures, SMART Agriculture, SMART Parks, SMART Airports, etc.

## **KEYWORDS**

Smart Solutions, SDI.

## **INTRODUCTION**

Powered by the worldwide implementation of geospatially enabled public infrastructures based in Intergraph geospatial portfolio and, the subsequent requests for more and wider integration with existing or new systems based in our own technologic platforms for public safety and security and for utilities and communications, Intergraph noticed the opportunity to build up complete yet flexible solutions that open way for coherent management, easy access to all the relevant information and smarter decisions.

From the team up of expertise and experiences out of our leading industries, guided by the standardization and interoperability visions of the SDI concept, validated by the real needs and requests from our customers, and fostered by the Hexagon Group partnerships and synergies (equipment, sensors, software and know-how), Intergraph came out with these solutions and are currently putting them to practice.

## **CONCEPT AND CONTEXT**

Smart Solutions are fitted to organizations that wants to wisely operate and manage its infrastructures and resources, accordingly to a well-balanced model of investments between human and physical resources and social and environmental responsibilities, supported on integrated information and communication technologies that will empower its sustainability and efficiency, assuring a high quality of results and a wide participation and engagement.

Smart Solutions are composed of various parts working together, with a shared vision, common objectives and with an integrated approach. Even if operated by diverse players where each acts into its own specific field of action, a single overall coordination should be assured, that, by means of sharing, will enhance productivity, efficiency and competitiveness, improving knowledge and management tools within the organization.

Though, we can face Smart Solutions as conceptual solutions comprehending wise, shared and collaborative actions, each contributing with partial or thematic contributions that are useful and valuable to the whole organization.

The new context brought by Hexagon Group, with the new partnerships and new synergies at Intergraph disposal, opened way to the concretization of such concepts within the group, with a major role played by Intergraph as technology provider.

Taking advantage of our best experiences to foster the concept, a challenging evolution from Spatial Data Infrastructures (SDI) to far-reaching solutions was undertaken.

Capable of responding to a more critical, demanding and diverse scope of essential needs, including branches to complementary domains like Emergency planning and response, Critical assets management and Security surveillance, Infrastructures management and public works monitoring and, Environmental and energetic improvements, these are Intergraph SMART Solutions, developed and explored in a tailored fashion addressing a wide range of business needs.

### SMART SOLUTIONS EXAMPLES

All around the globe concepts like SMART H<sub>2</sub>O Solution (Fig.1) [1] or SMART Agriculture (Fig.2) [2] are being explored in the management of critical water infrastructures or profitable farming enhancements.

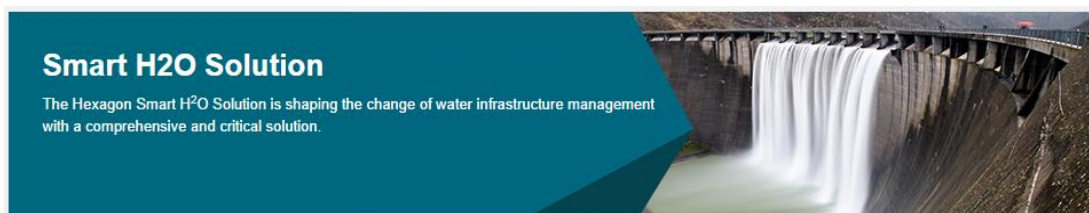


Figure 1: SMART H<sub>2</sub>O Solution.

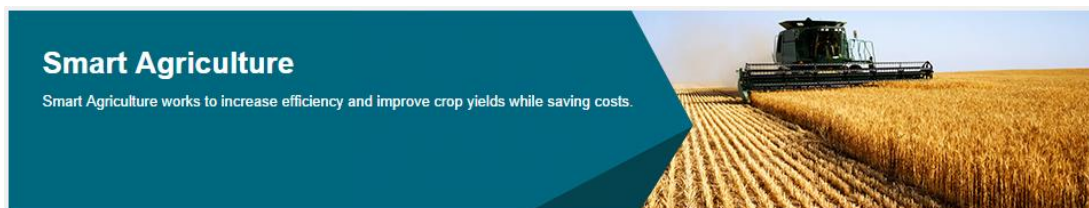


Figure 2: SMART Agriculture.

Even being two so different worlds to compare in the scope of a management solution we could try to review how the wide Smart Solutions concept can be applicable, to these and other cases.

In the SMART H<sub>2</sub>O Solution, the major goal is the Water Infrastructure Management, considering a variety of factors to be integrated and orchestrated at the same time, life, ranging from the Warning Systems to raise alarms of any type (based on Hexagon and Leica sensors for precise monitoring), to the Multi-Agency Coordination in case of Emergency Response needs, guaranteeing Critical Assets Protection, though Reducing the Risk of Failure and a more reliable Disaster Safeguard (Fig. 3). With this major highlights comes all the associated geospatially enabled technologies and solutions for surveillance, visualization, analysis, processing, modeling, dispatching, alerting, operating, managing, planning, evaluating, etc., in the field, in a security monitoring video wall, in the administration offices or in a situation room.

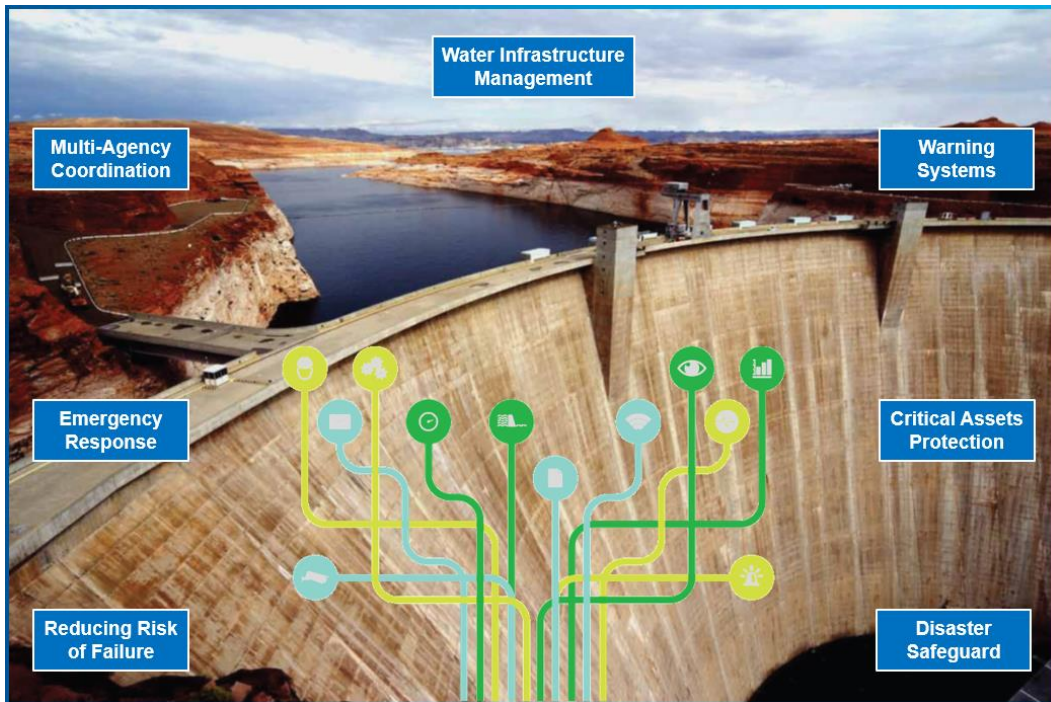


Figure 3: SMART H<sup>2</sup>O Solution - Major Aspects.

In the Smart Agriculture Solution, as the business is quite different and the factor “risk” is overwhelmed by the factor “productivity”, the Agribusiness Management major goal is addressed by means of a better Planning and Geoprocessing tools exploration for harvesting planning, Precision Auto Piloting of heavy machinery and Integrated Fleet Management, to enhance the business process, with Reduced Waste and risks and Increased Productivity, allied to better control from Remote Monitoring and the possibility of using drones to survey and monitor the crops (Fig. 4).

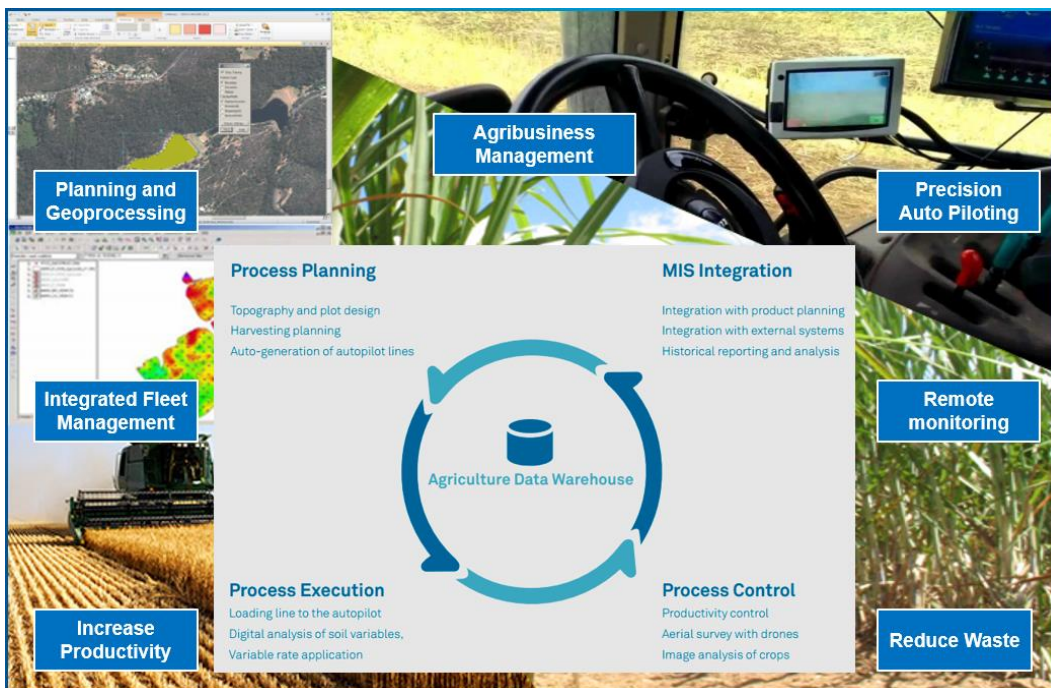


Figure 4: SMART Agriculture Solution - Major Aspects.

Other example, also very common, is the concept of SMART City, populating amongst bigger and wisely-managed cities worldwide. We are using here the example of Edmonton (Canada) (Fig. 5) [3] to foster the city Governance & Administration major goal, based on a wise and publicly participated management model that includes the diverse levels of Transport Networks, city dependent or autonomous electricity, water, sewage, telecom, etc. Infrastructures and Utilities, the Safety and Security & Emergency Response actors (Police, Firemen, Ambulances, etc.) that will participate in Civil Protection needs, all based on state of the art IT solutions, but also other themes like Urban Mobility and Environmental Management, conducing to less pollutant emissions, more efficient and rewarding quality of live with a minor ecological footprint.



Figure 5: SMART City - Edmonton example.

As last example and giving way to the possibilities for applying the Intergraph Smart Solutions concept, we get the focus on a SMART Industry prototype, as we could be using a number of other similar concepts that are being developed for SMART Transport Hubs, SMART Environment, SMART Electrical Grids, etc.

In this example, the Management & Administration of an industrial facility (Fig. 6) considers the integration and remote orchestration of so different subjects as the Security and Surveillance (human, video and other kind of sensor based surveys) of the premises, the Emergency Response and dispatch in case of any hazard, the infrastructure Support Services like telecom, power, wireless and radio networks, etc.; the Maintenance Management of diverse and on premises operating teams, the Production Enhancement by means of Critical Infrastructure Protection (like distribution pipelines and other business critical assets) and integrated and shared knowledge and resources for the all facility. All this working together and with an eye in the Environmental Sustainability of the all operations will result in a wisely-managed industry, with higher results and better public acceptance.



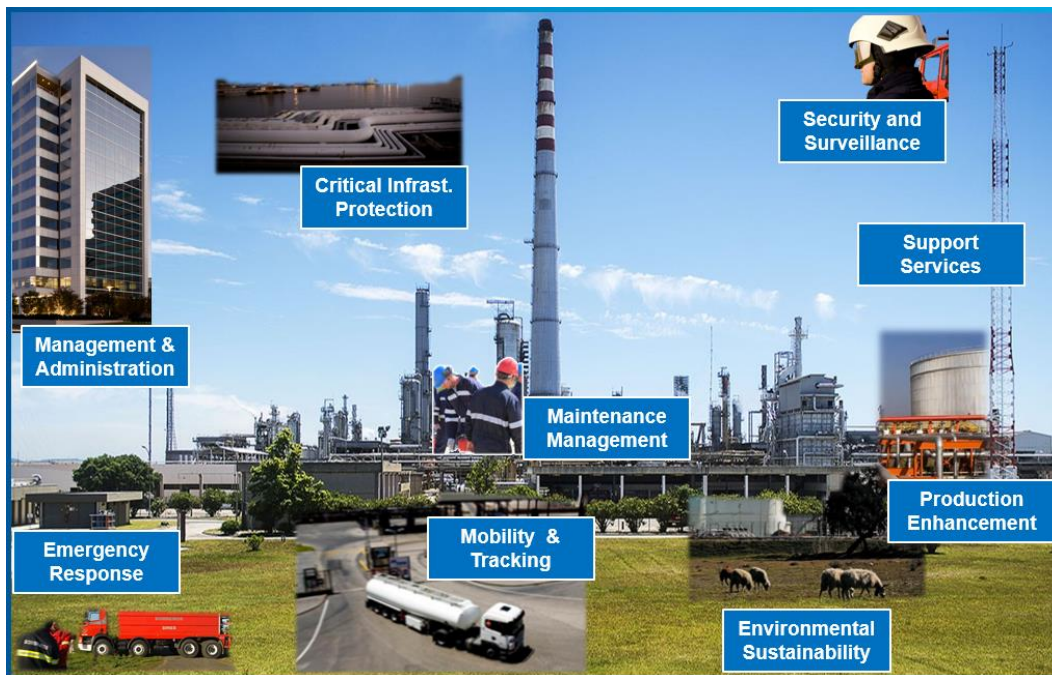


Figure 6: A SMART Industry prototype.

This approach based on diverse optional components that can be articulated as any specific business demands, in the format of such SMART Solutions concept, with integration bridges between technologies and between these and other external systems, rely on an SDI core that plays a fundamental role with the geospatial portals acting as collaborative enterprise-level platforms for coherent access and management of the overall system.

## REFERENCES

- [1] Hexagon Solutions - SMART H<sup>2</sup>O Solution: Shaping the Future of our Water Resources, [http://www.hexagon-solutions.com/downloads/h2o\\_brochure.pdf](http://www.hexagon-solutions.com/downloads/h2o_brochure.pdf)
- [2] Hexagon Solutions - SMART Agriculture Solution: Providing Nourishment for a Growing World, [http://www.hexagon-solutions.com/downloads/Hexagon-Smart-Ag\\_web.pdf](http://www.hexagon-solutions.com/downloads/Hexagon-Smart-Ag_web.pdf)
- [3] Intergraph - EDMONTON: SMART CITY, <http://yoursmartcities.com/>

## AUTHOR

**Carlos LAIGINHAS**  
 carlos.laiginhas@intergraph.com  
 Intergraph (Portugal)  
 Security, Government and Infrastructure