

The Need and Use of the Framework from the Perspective of the Private Sector

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UN-GGIM PSN WG LAM

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HEXAGON'S DIVISIONS CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

The 17 UN Sustainable Development Goals (SDGs) are the blueprint to achieve a better and more sustainable future for all. Below are examples of how Hexagon's divisions contribute in some of these 17 areas.

MANUFACTURING INTELLIGENCE

Through sensors and software for quality inspection, Manufacturing Intelligence contributes to more efficiency and productivity in manufacturing processes, from design to production to reducing material and time waste.



PPM

PPM provides end-to-end software solutions, from design to the operation of plants, that integrate complex process flows and systems. The outcome is more stable, resource-efficient and productive processes, as well as improved security for equipment operators and managers.



GEOSYSTEMS

Geosystems offers a world-leading portfolio of sensors and software for capturing and processing data, creating digital 3D maps and models of the real world used for decision-making in industries such as surveying, infrastructure, mining and construction.



SAFETY & INFRASTRUCTURE

Safety & Infrastructure's solutions are used within public safety and incident response, for building intelligent transportation systems, improving productivity in water management and protecting critical infrastructure and sensitive ecosystems.



POSITIONING INTELLIGENCE

Positioning Intelligence contributes to sustainable agriculture, to public safety solutions and to reduced emissions and accidents by enabling autonomous vehicles.



LAM is managed by Hexagon Geosystems Division, Heerbrugg, Switzerland

LEADER IN GEOSPATIAL INFORMATION TECHNOLOGIES

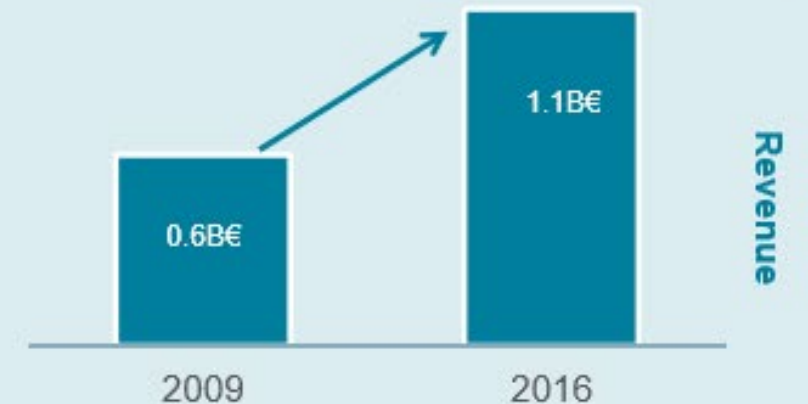
- Geosystems offers **innovative solutions & services** for professionals to plan and execute projects with highest **productivity & quality**

GLOBAL THINKING & LOCAL ACTING

- Active business in more than 150 countries
- 4500 employees in 34 countries

STRONG FINANCIALS (2016)

- 1.1B EUR revenue
- Solid growth (organic & acquisition)
- 11% of net sales invested in R&D

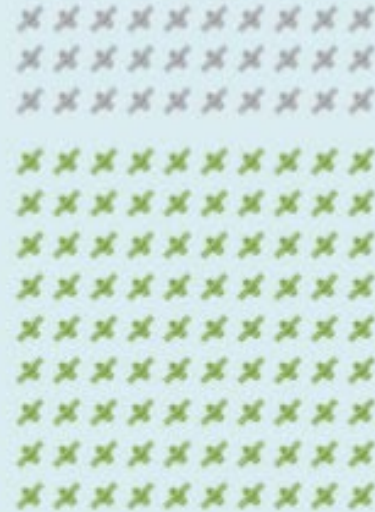


Stay “Connected” - Excellent GNSS options in 2020, has definitely an Impact on LAM



120
In 2020

GNSS Satellites



GPS, Glonass, BeiDou, Galileo



Everywhere without
Mobile Internet
<5 cm

Reference Network
& Mobile Internet
1 cm in seconds



The UN-GGIM Private Sector Network

Background: UN-GGIM has recognized the integral role of private sector stakeholders in achieving its goals of promoting the global use of geospatial information

- Recognized that a more coordinated private sector network will provide greater benefit and improved connection and communication for both: private sector stakeholders and member states
- The 2016 progress report towards the Sustainable Development Goals notes, that new data sources and technologies for data collection will need to be explored through partnerships with civil society, the private sector and academia
- Agreed to the establishment of Private Sector Network (PSN)

The UN-GGIM PSN WG “Land Administration & Management (LAM)”

Was established 2017

- Members:
 - Dieter Fritsch (Chair), Hexagon, Switzerland
 - Willy Govender, Data World, South Africa
 - Mike Gold, Esri, USA
 - Craig Hill, Hexagon, Switzerland
 - Peter Ritchie & Roland Klaus, GIS/Transport, Nigeria
 - Slayer Kou-Yu, GeoThings, Korea
 - Abdulvahit Torun, Aperigae, Turkey
 - Ken Harkin, Sparx Systems, Australia
- Any interest in the UN-GGIM PSN LAM → please get in touch with dieter.fritsch@ifp.uni-stuttgart.de

The UN-GGIM PSN WG “Land Administration & Management (LAM)”

- Objectives of the WG:
 - Make contributions to the UN-GGIM wrt LAM, especially to the UN-GGIM Expert Group LAM
 - Leveraging LAM on behalf of the Private Sector
 - Contributions to the implementations of the UN SDGs2030
 - Provide models for collaborations between LAM stakeholders: GO, NMCCAs, Academia and the Private Sector
 - Watch for innovation and technology developments useful for LAM
- The FELA Draft has been disseminated to the PSN LAM Members in Mid April 2019
- Small comments as feedback sent directly to Kees and Eva, End of April 2019

PSN LAM View: Land Administration & Management (LAM) and Digitalization

**Land Administration and Management has been completely digitized in the Developed World!
Thanks to the following Stakeholders:**

- (1) Academia (A)
- (2) The Private Sector (PS)
- (3) Governmental Organizations, National Mapping and Cadastral Agencies (NMCAs)
- (4) Non-Governmental Organizations (NGOs)

Therefore bilateral (& trilateral) cooperations are a must!

- **The FELA is an excellent document to transfer LAM knowledge to developing countries**
- **The PSN is interested in Business Cases (BCs), also in LAM! Thus any guidance to realize BCs is gratefully acknowledged!**
- **The PSN is ready-to-go with fundamental BCs and is seeking cooperation partners**

Business Case 1 “LAM in Practice - Providing Orthophotos and Parcel Overlays“



Orthos by:

- HR Satellites
- Airborne photogr
- UAVs

Ground truth by:

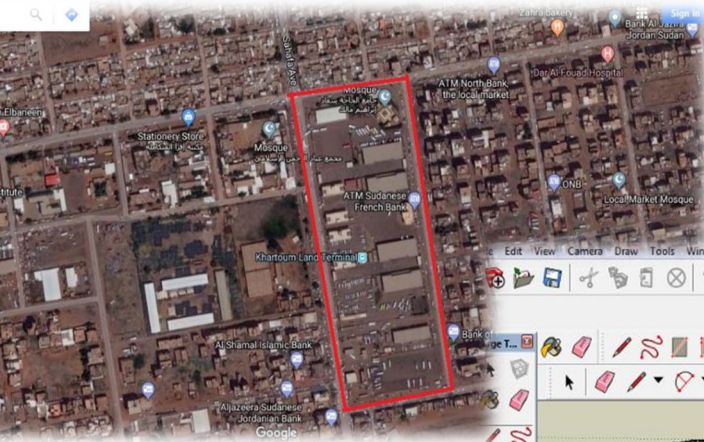
- Diff GNSS

Digitization by:

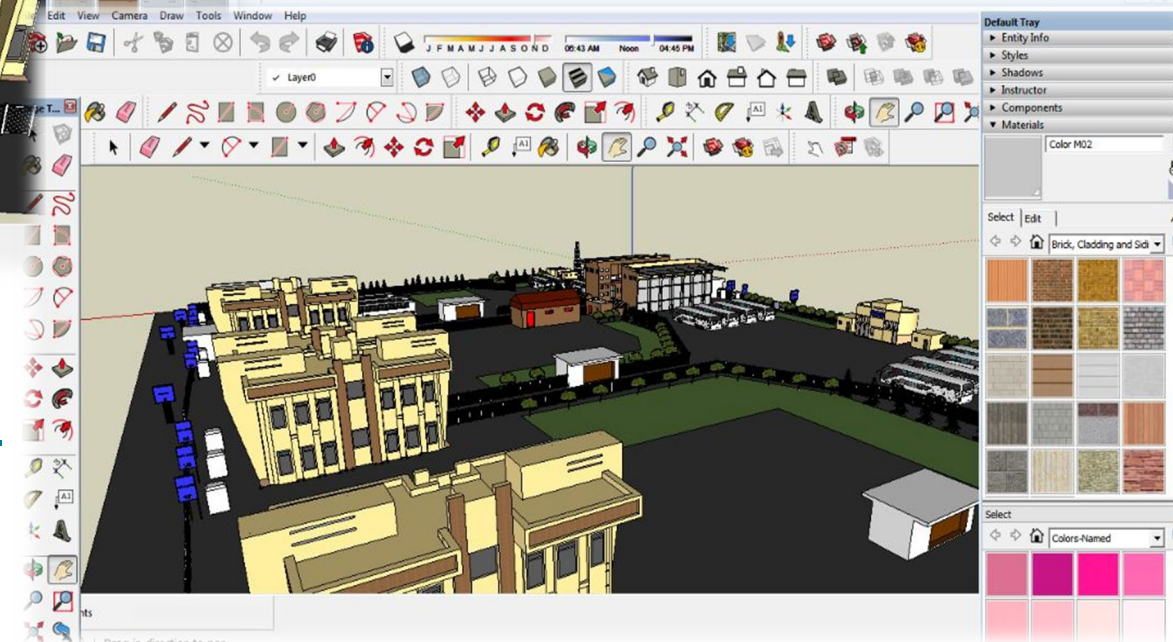
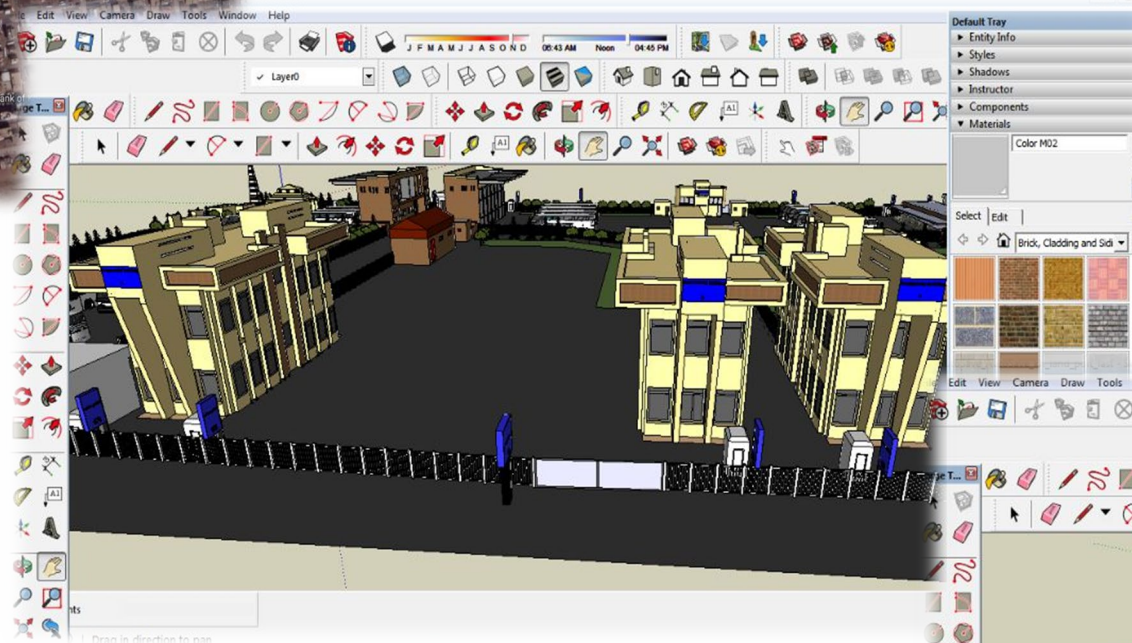
- On-screen
- Complemented by in situ

Huge Demand in Sudan! (and Africa)

Business Case 1 “LAM in Practice - Providing Orthophotos and Parcel Overlays for 3D”



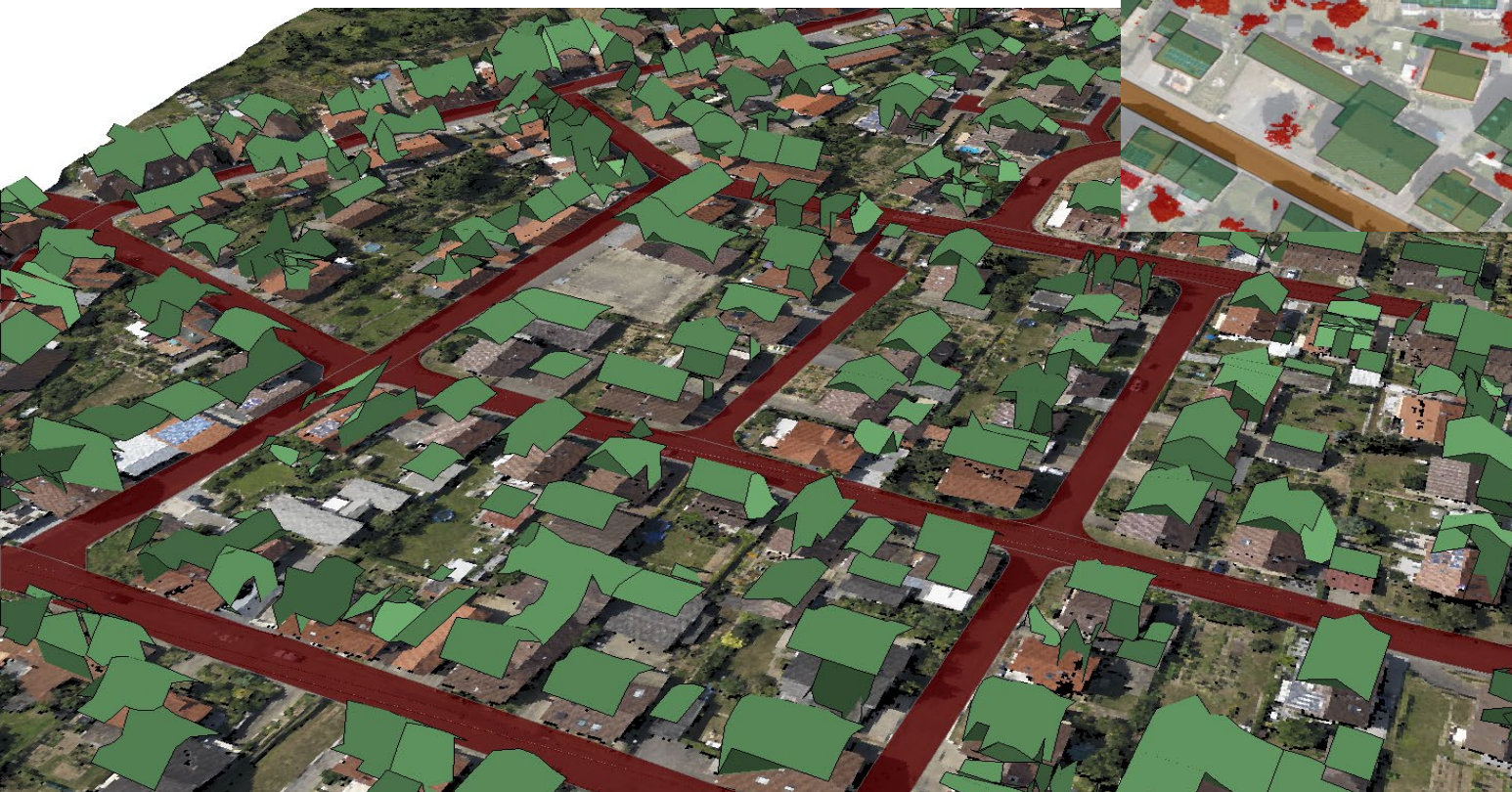
3D Reconstruction “Khartoum Land Terminal” – so far no cadastre info available



- GIS In Computer Science, SUST Khartoum, Sudan
- Topics: LAM, LU Planning, 3D Recos, Waste Site Plan.
- 40 Master's Thesis supervised by D.Fritsch (2016-19)
- 5 PhD Students¹⁰ in supervision

Business Case 2 “LAM in Practice – Detecting Unregistered Buildings”

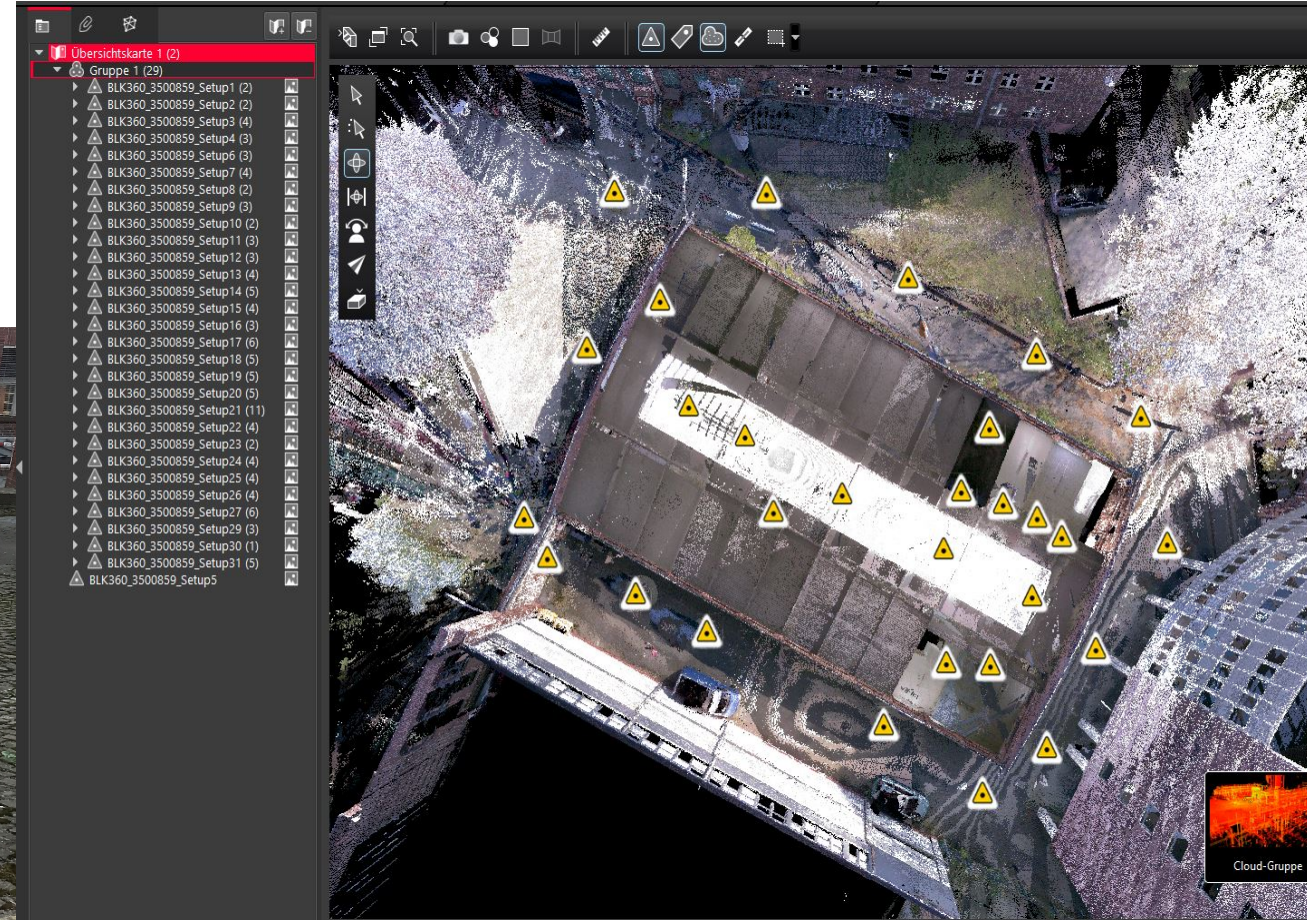
- Input: DSM from DIM, building footprints
- Compute DTM by Morphologic “Open”
- Subtract DTM from DSM
- Proof for features $>3\text{m}$ and not registered



Huge business case in Egypt:
Gvnmt will tax the secondary/
leisure homes along the Medit.
and Red Sea

Business Case 3 “LAM in Practice – High Ed in Modern Surveying“

- Educate GUC students in CE and Architecture wrt LAM
- Demonstrate latest innovations in GNSS, survey.
- Laser scanning



The German University in Cairo, Egypt!
A private enterprise and no 1 in Egypt

Land Administration on behalf of DataWorld (PSN LAM Partner)

01 Cadastre Management

02 Land Registry/Titling

03 Land Use Management

04 Valuation / CAMA

05 Building Control

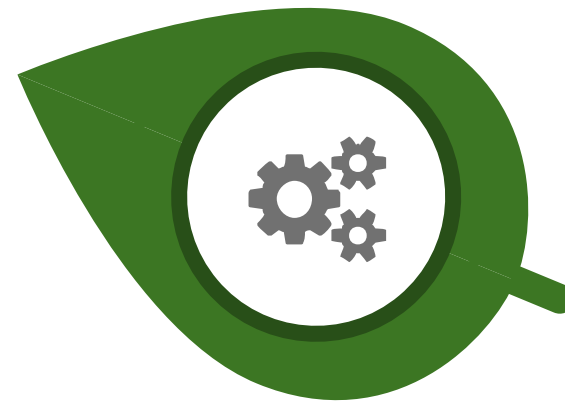
06 Land Administration System

07 e-Services

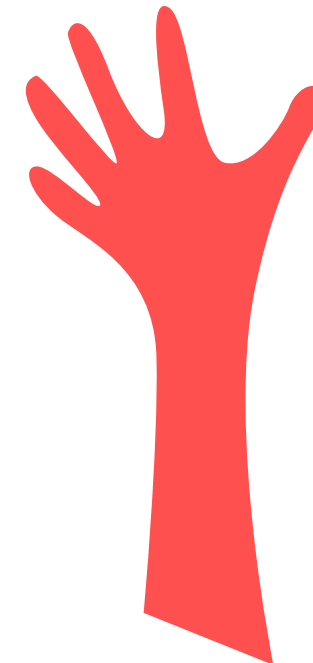
08 Analytics

09 Field Services Management

Provided services to over 20 Municipalities for about 5 million properties



Expertise to offer a range of services to provide end to end solution



Offering services around Valuation, Billing, Taxation and GIS

Land Revenue Opportunities



Private Sector Involvement



PPPs



Models for Revenue
Generation

PPPs

- Turnkey models
- BOT
- XAAS
- Data Centralisation/Standardisation
- Spatial Planning
- Revenue Generation/Optimization

PSN LAM “Lessons Learned”

- The FELA is an excellent document to transfer LAM knowledge to developing countries!
- THE PSN LAM agrees with the contents

But

- The developed world should not act as “Master Teacher” knowing everything better
- We have to respect national laws, guidelines and experiences
- Convince the customers by “suitable and successful projects”, also in difficult times!
- We have to get trust from our customers to cooperate smart and sustainable
- Be always a reliable partner
- The Private Sector continuously provides innovations and products – “Education, education, education” is the key for developing professionals, also for LAM
- Besides podcasts, videocasts, MOOCs, the Private Sector offers YouTube videos and Webinars for further education
- The Private Sector supports private education enterprises, example GUC, Egypt!

PSN LAM Summary and Outlook

- The FELA is for sure a necessary UN-GGIM document
- It will help to realize projects in the developing countries, especially in Africa
- The Private Sector is seeking support by the World Bank, EU Countries, Academia, POs, NMCAs and NGOs to start LAM projects in Africa.
- We need “Projects, Projects, and Projects”. We should not loose time, We would like to serve the people to make their home country a better place.