

# "The surveying profession has a history of quick and agile adaptation to technology changes"



says Dr Chryssy A Potsiou, President International Federation of Surveyors (FIG) while discussing the mandate and achievements of FIG and issues before surveying community and profession

## Tell us about FIG. What is its vision?

FIG was founded on July 18 1878 in Paris by delegates from seven national associations - Belgium, France, Germany, Great Britain, Italy, Spain and Switzerland. Today FIG has been recognized by the United Nations and the World Bank as the leading international non-governmental organization on geospatial information and the management of "land", the "sea" and the "built" environment. It is within the surveyors' task to determine the size and shape of the earth, to map its surface and to manage it in a sustainable way. FIG is the Federation of national member associations as well as

affiliated members, academic members and corporate members from over 120 countries, and covers the whole range of professional fields within the global surveying community, such as professional and educational aspects, surveying, cadastre, property valuation and management of real estate, spatial information management, geodesy, photogrammetry, remote sensing, hydrography, planning and construction economics and management. It provides an international forum for discussion and development aiming to promote professional practice and standards.

The vision of FIG is of a modern and sustainable surveying profession in support of society, environment and economy by providing innovative, reliable and best practice solutions to our rapidly changing and complex world, acting with integrity and confidence about the usefulness of surveying, and translating these words into action.

## What is the mandate and the role of FIG?

The role of FIG is to support a prosperous and sustainable profession of surveyors to provide solution functionality, reliably and affordably for a complex and rapidly changing world that cannot wait. FIG supports international collaboration among its members, as well as its sister and regional organizations, for the progress of surveying in all its fields and applications everywhere. FIG also cooperates with the UN bodies, including FAO and the World Bank, in support of governments for the implementation of the ambitious Sustainable Development Agenda 2030.

It is the mandate of FIG to create "global" surveyors capable to contribute to the sustainable development agenda. Surveyors who will have a "global education" that covers all fields of surveying but also who will have an understanding of the "global challenges" and who will be capable to develop the profession and work efficiently everywhere in order to improve every part of our world, so that nobody will be left behind.

## What are the areas where FIG is currently focusing?

One of the major efforts of FIG is to continuously develop the profession and at the same time to increase the value of the surveyors' services to society. We aim

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to increase the value of our geodata and of our land tools in order to deliver more economic and social benefit with greater transparency and environmental quality toward more fairness, more safety, more efficiency in governance of urban and rural areas, more smart and happy cities.

The greatest challenge of our profession today is to secure tenure and ensure and map property rights for all by 2030 and that way to contribute to the number 1 Sustainable Development Goal extreme poverty alleviation. Our mission is to contribute to this effort. Cadastral data on many millions of unregistered parcels referring to spatial units, rights (including use rights), persons and parties must be collected, linked, maintained and published timely in a reliable, affordable and inclusive way.

Surveyors all over the world are committed and encouraged to test and take advantage of the current and emerging technological developments such as all available 3d tools, BIM, GNSS, UAVs, digital cameras, smart devices, the cloud, blockchain technology, Internet of Things, and crowdsourcing methodology in order to improve their service to society.

Let us consider how the world was structured and how people used to live, think and work before electricity was invented. And how electricity has changed the way people live and work, and the way we construct our built environment. Similarly, the current and emerging technological developments are anticipated to change the way we live and work radically; they will inevitably change our profession as well. They will enable the digitalization of our society

and will enhance globalization. Access to property rights on land for all: young and old, rich and poor, male and female, as well as property registration at the global level, a difficult technical and political issue for centuries, has become achievable in our days due to the technological developments. And we do believe that our generation will make this happen.

FIG has coordinated efforts of all 10 Commissions to provide the needed network and information sharing on professional issues and ethics, continuing professional development, spatial data infrastructures, marine issues and the Blue economy, technical aspects, fit for purpose land administration, 3d cadastre, cadastre 4.0, design and development implementation standards in the land administration domain, land use and planning issues, property markets, valuation and taxation, and quantity surveying.

### Can you highlight some of the achievements of FIG?

We cooperate with UN bodies, including FAO and the World Bank in order to raise awareness of the value of geospatial information and land tools, and we maximize our efforts to outreach and strengthen capacity-building especially in developing countries, as well as to support harmonization in institutional arrangements in geospatial information management.

Our cooperation with international organizations includes contributions to the development of a global 5-year strategic plan for the implementation of the global

geodetic reference frame; the development of geospatial standards, the International Construction Measurement Standards (ICMS) which was launched in July 2017; and provision of technical support to governments to establish national and regional spatial data infrastructures. The development of various guidelines and the sharing of principles in current trends in legal and policy frameworks is vital as we assist countries to take practical actions to achieve a digital transformation, and to bridge the geospatial digital divide in the implementation of the 2030 Agenda for Sustainable Development.

We have produced publications on property taxation, on fit-for-purpose land administration, on 3D cadaster and on formalizing informal settlements. We published the Social Tenure Domain Model in Arabic, French and Japanese. We work on more publications in the field of real estate markets, a guide for formalization of informal development, a publication on valuation of unregistered lands, as well as on block chain and on crowdsourcing in surveying. We continue to contribute in the Global Land Tool Network; we have contributed in the development of the International Ethics Standard and we have supported the adoption of the Global Surveyors' Day. These are some of our recent achievements.

### Do you think that the surveying profession is transforming enough to keep with the pace of the technology changes?

The surveying profession has a history of quick and agile adaptation to technology changes since World War II, from the use of the measuring chain, steel tape and theodolite to GPS, precise point positioning, real time kinematic measurement, several generations of computer technology, GNSS, LIDAR, UAVs, smart devices and multiple other advances. The surveying profession in this 21st century is constantly adapting to new tools and new concepts. It now becomes obvious that we are currently both challenged and excited by the new

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concepts like The Internet of Things, the block chain (and crypto currencies), data mining, VGI and crowdsourcing. The profession will have no difficulty adapting to the marvelous advances yet to come. As for the expectations of the users of surveying services, the profession has likewise demonstrated its ability to meet the needs and demands of society by rigorous educational efforts and the innovative energy of its members.

## How do you see the role of new technologies like UAVs?

Surveyors quickly adopted any practical uses for UAVs, and they use them as a tool for faster and cost-effective production of traditional surveying products such as orthophotos, and for the creation of innovative applications such as real-time monitoring of constructions, etc. There is such a large variety of UAVs available now as to their size, cost, and carrying ability of data collection sources (such as optical and thermal cameras, LIDAR) that may be used for a variety of surveying applications such as archaeological documentations, 3D models creation, DTM and DSM production, monitoring, disaster management, cadastral applications up to mine documentation and recording of minerals, indoor applications or other specialized uses that may develop without compromising the precision of surveying work, remembering that the UAV started out as a mere toy, and like many technological advances was an innovation looking for a useful role. It is a tool still under development that will give us more surprises in future.

## What is your views on crowdsourcing?

Crowdsourcing, a relatively new concept in surveying today, is, like all new concepts, defined differently by different experts. "How the power of the many can be leveraged to accomplish feats that were once the responsibility of a specialized few." Another says that crowdsourcing is "The practice of obtaining needed services, ideas or content by soliciting contributions

from a large group of people...". The principle of crowdsourcing is, apparently, that more heads are better than one, and that every person has something of value to contribute. How, then, is crowdsourcing an application of benefit to surveying? Much of what we read about crowd sourcing has to do with so-called ideation, meaning that the technique is applied in a search for new ideas, e.g., to support the Sustainable Development Goals (SDGs). It is used for problem solving. Crowdsourcing is often used in micro-tasking, that is, in breaking work up into very small tasks and sending the work out to the "crowd." The theory is that work may be done faster and cheaper and with fewer errors when validation systems are in place. We understand that when crowdsourcing is utilized in surveying, its value is primarily in the geo-data collection process. As an example, collecting data about certain species of trees or about the damaged constructions following a disaster in an urban environment, or even for first draft registration of property rights in areas lacking a land administration system in order to meet the SDGs by 2030, could be accomplished affordably, reliably and timely by the "crowd." When used in surveying the issue of validation will be critical, and assumes a certain amount of preparation and training of members of the so-called crowd. In which case, is it really a crowd or should it be thought of as a collection of amateur volunteers? But is crowdsourcing suitable for identification of fixed objects and material features, as is the objective of much surveying? The presentation of such information in x, y, z format is what surveyors do so that other professionals, like engineers and constructors, will incorporate the

information into their own professional operations. For the professional surveyor in this type of crowdsourcing activity precision and accuracy are paramount and the risk of liability is problematic. This suggests that crowd sourcing in surveying will be concentrated on data-collection that is not positionally critical. Crowd sourcing has been likened to outsourcing, that is, sending jobs out of a company or institution to some other pool of cheaper labor with the euphemism of crowd funding. As such, it has been met by social resistance in some quarters. This seems unlikely in surveying as long as the data collection services that are outsourced are not within the scope of classical data collection as provided by professional surveyors. All of which suggests a general rule for the application of crowd sourcing in surveying: It may involve the collection of information that is required to be neither positionally precise nor dimensionally accurate, yet, important enough to achieve the SDGs; and as long as positioning and validation improve, the use of VGI information will be relevant. FIG is working on a relevant publication.

## Please share your views on 3D cadastre?

Much of the current research by the surveying profession in this field focuses on issues related to 3d geo-information, tools for 3D data collection, cloud solutions, data management, optimizing processes and web-based information dissemination; standardization of 3d information, advanced modelling and visualization, as well as formalizing and building sustainable real estate markets as a pillar for robust economic urban

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growth; and related policies, legal and institutional aspects and knowledge sharing in operational experiences, the emerging challenges and good practices. The significance of these areas of interest for the good management of land, the sea and especially the built environment is well understood. No reality has a more direct bearing on the subject of 3 dimensional geo-information

and cadaster than the growth of large cities, especially in the developing countries of the world, and especially in the phenomenon of the mega cities.

### How do you see the future of Surveying education?

It becomes obvious that in the urbanization and globalization era, a globalization of science is also taking place. Surveyors should be prepared to cooperate with several other disciplines and allied professions; in some cases there may be severe competition from neighboring disciplines, as well; this is a challenge surveyors need to face through development of their own skills. Surveyors should be prepared to deal with data inflation, to cope with this large amount of information; they should also maintain in-depth research, and better education. Through cooperation with other professionals surveyors will increase their skills. And, yes! As an academic I do believe that students are fascinated by the

broad range of tasks a modern surveyor may undertake and the increased value of our services for society and they do realize that as long as they keep improving their skills there is no fear of unemployment in our profession. Since the time of Euclid in Ancient Greece and of Pharaoh in Egypt there is so much to be done in the management of land, the sea and the built environment to support the development of smart cities and the geospatial transformation of society that our profession will always be of great value.

### What are the challenges before the surveying profession?

The challenges for our profession are as they always have been: To remain relevant to social change and the changing demand for our services; to find the best and most practical use of technology; and to provide the best and most progressive educational preparation for young people looking to enter an exciting career of great promise. ▴

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