Navigating the Global Consciousness: A Young Surveyor's Future

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Summary

The crisis of surveying continues to haunt the literature of Commission 2 – low young surveying numbers, low FIG (International Federation of Surveyors) awareness and a near-invisible surveying public profile. But what is being done?

This paper summarises key recent literature relating to this issue and the future of the profession – particularly with reference to future applications and marketing. It is suggested that a clear, concise surveying profile is developed both nationally and regionally to enhance the public profile. Borders across the European Union and Asia may be opening up, but unless the borders between surveying disciplines become similarly permeable, surveying professionals will find it difficult to evolve in the future marketplace. Ultimately an inclusive profession needs to be developed and marketed to all.

Young surveyors in particular will benefit from such a move. As a generation they have already progressed beyond such issues – having grown up with this international world of 'plug-and-play'. But as a profession, greater mentorship and communication – across borders, generations and cultures – is required to raise the public surveying profile, in addition to the FIG profile within the profession.

The Young Surveyors Working Group was developed from 2006 to address such issues, and is rapidly consolidating on achievements so far – notably a record student attendance at the FIG Working Week in Stockholm, 2008. On the eve of the group's development into an FIG network, this paper summarises the key opportunities its success will create.

Keywords: Young surveyors, capacity development, standards, professional development, skills shortage, education

1. Crisis? What Crisis?

The crisis of a surveying skills shortages across the majority of countries in the Western developed world has been well documented (e.g. Williamson (1998); Hannah (2006); O'Connell (2006); Mahoney et al. (2007); Hucker (2008)). These authors report a shortage of students, a shortage of graduates remaining in the surveying profession, and a shortage of young surveyors actively participating in the professional organisations.

In Asia and the developing world, the story is similar, however with increasing access to higher education and rapidly growing infrastructure it is not so much a problem of insufficient students as much as a lack of graduates and experienced professionals to lead the way. The Yildiz Technical University Department of Geodesy and Photogrammetry Engineering in Turkey is planning to downsize student numbers due to limited teaching resources (Aydin et al. 2006). Weigel and Svabensky (2006) (and also Meha (2008)) further introduce the Eastern European viewpoint – that the required numbers of students and graduates is in strong contrast to the demands of practical teaching which requires lower staff to student ratios. In many cases across the globe the number of students graduating is in no way indicative of the number of graduates looking for jobs in the surveying disciplines – many finding apparently more lucrative work in adjacent fields and/or more lucrative countries (Hucker, 2008).

Mahoney et al. (2007) reports:

"It has been clear for some time, at least from the evidence presented at a number of FIG events, that the surveying profession is heading for a global crisis. The profession is changing and the number of competencies in which surveyors are actively involved is over 200."

So the crisis is a "skills" crisis **and** a numbers crisis. Many developed countries are struggling to attract and retain students and graduates of surveying, whilst developing countries are desperate for cross-disciplinal surveying leaders to assist in education, developing infrastructure and setting up effective land management systems.

1.1 The crisis in other industries

Is the crisis unique to surveying? In the Australian and UK cases, skills shortages are also seen across the IT (Thomson, 2008), Agricultural (King, 2004), Engineering (HRM, 2007) and Construction (Dainty et al., 2005) sectors – namely, those very sectors in which surveying skills are essential. The

economy boom up until 2008 is likely to have been particularly key in this, with job growth now significantly stalling, however Hucker (2008) reports:

"The recent credit crisis in the UK and the downturn in new starts for housing and offices will have an impact, but the latest survey figures available (Q1, 2008) still show 30% companies in the UK reporting difficulties in recruiting quantity surveyors"

Certainly plans by federal governments to stimulate the market are unlikely to negatively impact surveying employment opportunities

1.2 Marketability?

So is it a question of marketing? Hannah (2006) says yes by contrasting the cases of New Zealand and Australia – the former exhibiting no problems in attracting students and reporting similar findings to the Norwegian example of Leiknes (2008) where a change of name in the surveying course to one more recognised by society improved student applications and enrolments (in the Norwegian case, from 'Land Consolidation' to 'Land Surveying and Management'). In this case then, the marketing was successful in that it was in the language of the customer – that is, the layperson had a greater understanding of what "Land Surveying" was in comparison with "Land Consolidation".

This may also be the case in developing countries, or those recovering from environmental and political upheaval. Meha (2008) reports the case of Kosovo, where student numbers are at (an albeit small) capacity. In this case, it is perhaps the rapid infrastructural changes and development opportunities that are marketing the need for surveyors. Ghana (Tenadu and Djaba, 2008), if taken simplistically, may be in a similar category.

In such new surveying establishments, however, it may also be a case of 'inclusivity' – that is, a broader definition of the label 'surveyor'. With fewer experienced professionals about, firms are more likely to be approached for a wider range of surveying tasks, rather than finding niches as may have happened in developed countries in the past. Individuals are more likely to develop a wider range of skills – 'jack-of-all-trades' so to speak.

In the case of Australia, Fryer (1996) says "In the 1970s ... about 90% of graduates were registered nationally, with this reducing to about 50% in the 1980s and about 30% in the 1990s..." Here Fryer is referring to the percentage of graduates registered with the Institute of Surveyors Australia – an organisation that has the image of predominantly supporting cadastral surveyors. With such an image, few graduates *outside of* the cadastral surveying and measurement fields would join, let alone actively participate. And yet the surveying profession has grown rapidly beyond cadastral surveying, if indeed it ever was restricted to such, and this has been a topic of debate for the last decade in not only Australia, but more recently Canada. A 2008 Canadian report (Statham et al., 2008) reports the problems of a profession fractured over regions and disciplines "without an efficient cohesive voice to respond to the profession's key users in government, industry and the public". Canada and Australia are now promoting more streamlined and inclusive professional organisations, although in the case of Australia at least this is proving difficult with respect to accreditation and general professional image and voice. These efforts are similar to the much documented Bologna process (see, for example, Steinkeller & Heine, 2005) which promotes a European-wide system for education.

2. Changing face of Surveyors

Such efforts taking place across Australia and the EU are the result of two major changes taking place across all professions – internationalisation and interoperability.

2.1 Internationalisation: The global Surveyor

The surveyors of today work in an increasingly global market. The latter half of the 20th Century saw the birth of the United Nations, the formation of the European Union, the World Trade Organisation and the WorldBank – and increasing collaboration between the FIG and such external bodies (in particular the UN). The Bologna Process is now in force, following on from exchange programs such as ERASMUS in opening up educational borders across Europe. In Asia the "soon to be ratified ASEAN [Association of South East Asian Nations] Framework Arrangement for the Mutual Recognition of Surveying Qualifications" (Teo, 2006) will further open up international benefits to the surveying community.

And so, with increasing internationalisation, rapid technological change and deregulation of the profession, the Surveying Profession could be undergoing a 'growth period' (as Teo (2007) puts it) now more so than ever "*especially conside-*

ring... the increasing and extensive application of surveying and mapping technologies in business sectors" (Teo, 2007).

Again, it is a question of inclusiveness. Surveying in the FIG all-encompassing definition is indeed rapidly growing – both globally and in application – however in a traditional sense, the many surveying disciplines can still be thought of as discrete, limited packages. Thus, as with generation Y, the profession is facing a new paradigm – that of the 'interoperable' surveyor

2.2 The interoperable "Plug-and-Play" Surveyor

"Technology and knowledge are now primary production factors. Technological advances allow information to be instantly transmitted across the world, and the primary competitive advantage a company possesses is its process of innovation and its ability to derive value from information."(-Bullard, 2005)

The equipment we use on a day today basis is increasingly 'plug and play'. So too will be (is?) the young professional of the future. Williamson (1997) wrote that "environmental degradation, sustainable development, the management of our cities and economic rationalism all present enormous opportunities for the surveyors of the 21st century". The importance of issues central to our profession, such as cadastral reform and spatial data infrastructures, is being realised by policy makers as they grapple with the changing economic climate, sustainable development and social stability (Williamson, 1997).

Prendergast (2006) wrote of the wide range of EU Directives existing at European level, for example, the Water Framework Directive, the Services Directive, INSPIRE, the re-emerging Public Services Information Directive, the Environmental Directives – all of which present significant opportunities to European surveyors.

Other initiatives such as Galileo (the European Global Navigation Satellite System), GMES (Global Monitoring and Environmental Systems) and eGovernment (to create an Information Society and Knowledge Economy) can be harnessed to positively promote surveying as the profession for future generations.

So with so many opportunities, and with governments and policy makers globally realising the capabilities of surveyors – how can there be a crisis? Fairlie (2008) largely attributes it to this issue of "inclusivity" – essentially a crisis of identity and the current industry paradigm of spatial versus surveying. Mahoney & Kavanagh (2006) state "One of the major challenges for the profession is whether or not it is able to capitalise upon this change…through the provision of added value services and fully engage with such diverse markets…" And it is a challenge – as Williamson (1997) states – "there are already other professions moving or ready to move into these traditional [and non-traditional] areas of the surveyor if we don't act" – in which case, surveying could end up as simply one professional branch on the Information Technology tree!

But back to the young surveyor, and the challenge of surveying versus spatial.

Hucker (2008) reports an increased number of students studying towards a UK surveying degree (in contrast to the crisis), however significant numbers do not continue to work as graduates in the UK – instead many take up positions in adjacent fields. From the Swedish viewpoint, Andersson et al. (2006) report the low commitment of graduates to continuing work with the national land authority (Lantmäteriet): *"Here [Sweden], the trainees think that prospects are poorer if one stays too long at any one place..."*. It is no longer considered enough to be a specialist in field – a more general knowledge across surveying thought and technology is required.

Enemark (2001) suggested that the educational profile of the future for surveyors should encompass the three areas of Measurement Science, Spatial Information Management, and Land Management – but the young surveyor's education in the future will surely engender much more than this, with few surveying courses stikking to just these fundamentals. The University of Calgary in Canada offers a geomatic engineering degree specializing also in biomedical engineering – utilizing spatial and measurement skills in the medical field. Meantime other universities are expanding beyond the traditional civil engineering or built environment/planning linkages to further combine surveying degrees with law, business, information technology, electrical engineering, software engineering and more.

However, with new disciplines seemingly developing every day, surveyors cannot expect a regulated and/or standardised market of geoinformatics and geo-services to evolve so rapidly (Prendergast, 2006). Tenadu and Djaba (2008) give examples of the need for having adequate standards in a national surveying market (in this case, Ghana) and the consequen-

ces a lack of adequate standards can have on growth and professional integrity. With developing countries experiencing the expansion of a surveying market (e.g. Kosovo – Meha (2008)) and the growing internationalisation of our profession (European Union, ASEAN, etc.) national and regional professional bodies will need assistance in developing and regulating new ethical principles and codes of professional conduct that not only suit the new roles surveying professionals will be working in, but the varying cultures across which they will be operating. The lack of surveying professionals and leaders in these developing countries makes this need even more critical – the young surveyors of the future will be dependent on the guidance of mentors and a reachable professional body.

In summary: the uncertain times we have begun to witness in 2008 – 'the credit crunch' – will further exacerbate the demand for multi-skilled 'plug-and-play' professionals – "levelling internal demand may be achieved by working a number of sectors and encouraging flexible movement across sectors" (Hucker, 2008). Clear and transparent benchmarking procedures will be necessary to evaluate performance, identify needs and develop best practice for the future. This will be particularly important to young surveyors experiencing the effects of the skills and age gap before them.

2.3 Key issues as presented by young surveyors at FIG Working Week 2008

So far young surveyor issues have been presented from a profession and societal viewpoint – what did the young surveyors themselves put forth as critical for the future?

In essence, papers presented during the Young Surveyor session at the FIG Working Week in Stockholm, Sweden 2008 had three key themes:

- The FIG Young Surveyors Working Group (Kivilcim & McAlister, 2008) and schemes to improve young surveyor involvement (Fairlie, 2008)
- Young Surveyor employment and professional development (Brazenor, Carter & Dalrymple, 2008; Hasova, Svabensky & Weigel, 2008)
- Surveying Education (Boder, 2008; Aranda et al., 2008)

Kivilcim & McAlister (2008) gave an overview of the FIG Young Surveyors Working Group, to be updated and reviewed in the following sections, whilst Fairlie (2008) outlined a key opportunity (the Young Surveyors Beyond Horizons Project, to be run at the FIG2010 World Surveying Congress) to address a lack of young surveyor awareness and a lack of young surveyor participation in the FIG. Brazenor, Carter & Dalrymple (2008) strengthened support for the FIG Young Surveyors Network by placing an onus on both young surveyors and employers to develop themselves and provoke development opportunities while Boder (2008) and Aranda et al. (2008) further outlined opportunities for young surveyors and young surveyor promotion in the education sector.

These then are the main issues that Young Surveyors are passionate about, and which should be addressed by the FIG Young Surveyors Working Group, which will soon become into a Young Surveyors Network: namely young surveyor involvement, across all surveying disciplines and markets, in the future of the profession

3. Young Surveyors Network

"Lower surveyor numbers has a circular effect: Anecdotal evidence from the UK indicates that a relatively high proportion of surveying students are encouraged into the profession by personal contact with a practising surveyor who is either a member of the family or a close family friend" (Mahoney et al. 2007).

Young surveyors are not only the future of the surveying profession, but also a key element of the 'now'. They have enormous potential that has not yet been harnessed – specifically in promoting the evolving identity of surveying, and in adapting to new modes of work. Lack of awareness and lack of involvement may be two key elements inhibiting the future of surveying but it is communication that is key. Issues of low student numbers, young surveyor shortages and societal awareness are interrelated (Fairlie, 2008) – students will choose surveying if they know about it and think of it as a challenging, interesting and 'wealth-creating' career; but they are not the only market. With traditional surveying disciplines opening up into a whole host of alternative applications, as a profession we need to maintain strong links with adjacent professions and markets. In short – **a stronger network across generations, across cultures and across disciplines** is absolutely mandatory for the future of our profession.

3.1 SWOT – Strengths, Weaknesses, Opportunities & Threats

See Table 1 for an overview of the SWOT analysis of the evolving FIG Young Surveyors Network.

Strengths	Weaknesses
■ Dedicated group of young professionals ■ Strong cross-generational and cross-discipline support internationally ■ Strong FIG support ■ Momentum: working group is now to become a network, strong momentum can be built on.	■ Face to face meetings: are rare and hindered by distance and financial costs of travel. ■ Budget: no funding as yet ■ FIG events are often costly and not within young surveyor budget
Opportunities	**Threats**
■ Establish regional and global networks to: ■ Address young surveyor marketing and industry involvement ■ Improve and evolve standards of best practice; particularly relevant to the developing world ■ Ensure and promote continuity across generations in national and existing organisations ■ Peer networking for benchmarking and improved context/understanding (see Culliver, 2008) ■ Liaise with other young surveyor bodies to improve the industry generally (e.g. Architects; Engineers; Scientists; etc.) ■ Ensure cross-cultural awareness for future generation of global surveyors: Slaboch (2006) says "people are on the move from country to country bringing with them new habits, new values and new ethics." ■ Improved employer feedback; YS input into educational standards ■ Improve the FIG awareness and access of young surveyors in the developing world	■ Volunteer burnout *Current volunteers are enthusiastic, but busy. Need to ensure effective management and delegation of workload to new members* ■ Progress required to continue enthusiasm *Scope out quick wins to ensure momentum and early, easy promotion within the FIG to encourage continued support. Don't go in too heavy without the necessary support networks* ■ Recreate the wheel *Much work has already been done on this topic, and there are many knowledgeable people willing to lend a hand. Need to utilise these resources!*

Table 1: A SWOT overview for the evolving FIG Young Surveyors Network

3.2 Shaping the Change: Overview of the Young Surveyors Network

3.2.1 Overview

From Young Surveyors Network Draft Terms of Reference, developed by the Young Surveyors Working Group 2009:

The FIG Young Surveyors Network is a continuation of the work the FIG Young Surveyors Working Group started after it was formed during the FIG Congress in Munich 2006. The Young Surveyors Working group was established in response to the low number of young surveyors participating at FIG Events and the fact that FIG was largely unknown amongst Young Surveyors. Further, many of FIG's member organizations are reporting difficulties in attracting and retaining young people to the profession of surveying.

*The FIG Young Surveyors Network goal is thus to increase the number of **active** young surveyors within FIG and to create connections between "wiser" and "younger" surveyors.*

The first work plan for this group was developed in Cairo in October 2007.

3.2.2 Aims

From Young Surveyors Network Draft Terms of Reference, developed by the Young Surveyors Working Group 2009:

Building and maintaining relationships between young surveyors and FIG by:

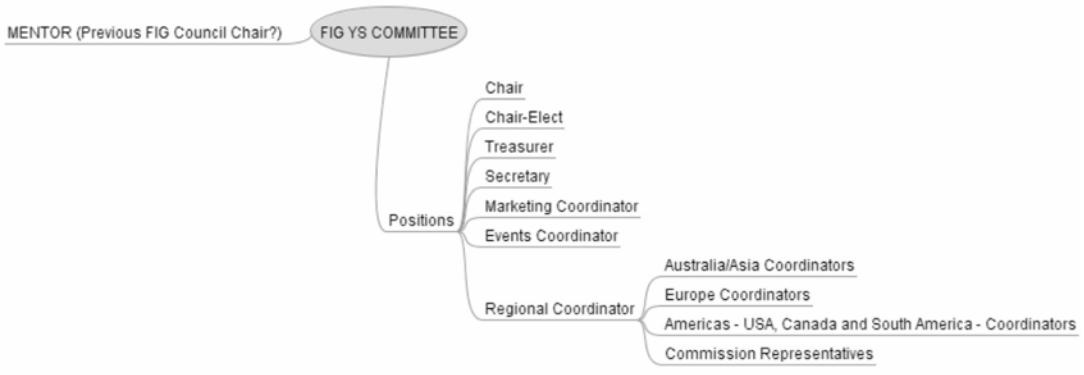

Fig. 1: Mind Map of FIG Young Surveyor Committee structure

- *Proposing and performing activities during FIG events to attract and promote FIG as an organisation for network and knowledge creation;*
- *Establish necessary Liaison relationships with other Young Surveyors organizations;*
- *Establishing and maintaining lead contacts to Commission Chairs etc are in place;*
- *Maintaining an information flow on the Young Surveyors Network to FIG members, including through the FIG website and FIG Bulletin, and more directly to relevant Commission Officers;*
- *Releasing the FIG Young Surveyors Newsletter quarterly with information about what's happening in the YS community.*

The Young Surveyors Network sees itself as at the hub of FIG Young Surveyors activities, making the necessary linkages and providing the necessary advice to commissions and others.

Specific performance indicators include achieving the following at or before the FIG2010 World Surveying Congress in Sydney, Australia:

Management structure firmly in place, including the positions as per Figure 1.

Increase awareness and active participation such that elections akin to the FIG Council can be held for the Young Surveyors Network

Incorporate all regional young surveyor networks that are currently known to exist, and establish regional coordinators and a set of tasks to manage regional expansion

3.2.3 Opportunities

Fairlie (2008) outlines the Young Surveyors Beyond Horizons Project that is the key opportunity and major project hosted jointly by the Young Surveyors Working Group and the FIG 2010 Young Ambassadors.

From Fairlie (2008):

The project will see a series of technical activities held throughout Australia, targeting the application of Surveying knowledge and technology. Attendance will be marketed towards young surveyors, adding value to the potentially long and expensive journey to Australia. A number of experienced and professional surveyors will be invited to attend, building on the mentorship program of the FIG1.2 Young Surveyors Working Group and fulfilling further networking aims of the FIG Congress.

Activities are intended to be either

- Real projects contributing to local communities
- Real projects derived from industry research and development foci
- Historical projects demonstrating the contributions of the surveying profession to Australia

This opportunity presented by this ambitious project is that it is essentially a testing ground for future activities like it which add value to Young Surveyor participation in FIG events, improve funding possibilities, and generally create media attention to the surveying profession. Finally, this project is a test of possible future revenue generation for Young Surveyor activities.

The ultimate, long-term opportunity is to grow the Young Surveyors Beyond Horizons project such that it fulfils a similar role as Engineer's Without Borders (www.ewb-international.org) and Architects Without Borders (www.awb.iohome.net/)/Architects Without Frontiers (www.archi-

tectswithoutfrontiers.com.au). Initially projects would be limited to increasing young surveyor networks and skill levels whilst profiting our own industry: for example, Tenadu & Djaba (2008) mention a lack of GPS baseline permanent reference stations in Ghana, limiting GPS calibration. The Young Surveyor's Network could challenge young surveyors to use this as an opportunity, not only improve the integrity of the profession in Ghana, but to improve the African regional network of young surveyors and international FIG participation. Such projects further improve cross-generational linkages, involving more experienced surveyors as consultants and mentors.

Ultimately there is scope for a future, ongoing "Surveyors Without Borders" skillpool – and promotion such that surveyors are the first to be called for where necessary.

4. Conclusion

"Engineering in the 21st C faces several challenges: firstly it is oriented towards global markets and products; secondly, the underlying knowledge quickly becomes obsolete; thirdly, it must operate within an increasingly stressed natural and social environment" (Enemark, S. 2006).

The crisis in surveying – skill shortages and low public awareness – is real, and unlikely to be overcome quickly or easily. However, it is as much a crisis of interpretation as anything else – the surveying tools and knowledge is there, it is simply a case communicating its existence, and ensuring the professional integrity of the industry.

Young Surveyors as a key element of the crisis are also a key solution. The Young Surveyor's Working Group has demonstrated the power and commitment of this generation, and a passion to overcome the challenges of the future. Mentoring and networking across generations and cultures will be key to continuing and expanding this group to encompass an international network of young surveyors. There are extensive opportunities, and the time is ripe for Young Surveyors to navigate this global consciousness.

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Please note: all papers, unless labelled otherwise, can be accessed via the FIG Surveyor's Reference Library at http://www.fig.net/srl/

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Biographical Notes

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Kate Fairlie as a recent graduate of the University of New South Wales (UNSW) admits to being a Gen Y'er. She has a Bachelor of Engineering (Surveying and Spatial Information Systems). Throughout her university degree, Kate was awarded a number of awards and scholarships, including the UNSW Coop Scholarship which led her to work placements with the New South Wales Department of Lands and a Sydney cadastral surveying firm. Kate is about to embark on PhD studies with the University of Technology (Sydney), having most recently worked as a GeoInformation Analyst with Shell UK Exploration and Production.

Kate has been involved in a number of young surveyor and young engineer activities, including being an Engineering Ambassador for UNSW – promoting engineering as a career to high school students in Australia. She is a member of the FIG Commission 1.2 Young Surveyors Working Group, and has been active in the NSW division of the Institute of Surveyors Australia, the Spatial Sciences Institute of Australia and Young Engineers Australia. Kate has organized a number of New Professional and Student networking and development events within Shell – and is looking forward to Young Surveyors beyond Horizons!

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