THE REFLECTION OF YOUNG PROFESSIONALS

FIDIC 2018 International Infrastructure Conference Booklet

Berlin, September 2018

YPFSC Booklet Sub-committee: Chair: Adam Bialachowski, Rafat Bouri, Jomanah AlBtoush, Wafaa Balla, Cosmin Tobolcea & Charles Frank

An event organised by the International Federation of Consulting Engineers (FIDIC)

GREETINGS,

Thank you for attending the **FIDIC 2018 International Infrastructure Conference** in **Berlin**, which is one of the significant and unique events in international scale for the engineering sector. Under the theme of **Mobility and Smart Infrastructure.**

At this conference all business leaders, stakeholders, decision makers, subject matters experts, funding agencies, young professionals (YPs), etc. from all over the world meet to discuss, face and tackle the global business challenges within a positive, diverse, balanced and resilient environment.

I am pleased that YPs are presented strongly at the conference through YPs Symposium, Future Leader Outlook, Technical Tour, YPFSC meetings, etc. hoping that our presence is effective, tangible and provide a real opportunity for YPs to unify their voice and to be an active part in FIDIC and the industry.

For the second year, FIDIC Young Professionals Forum Steering Committee (YPFSC) is glad to issue YPs booklet ''YPS Reflection'' to share **YPs thoughts, ideas, priorities, diversity and efforts**, through different articles from all over the world.

Hope that you will enjoy reading it and find it interesting and valuable.

Looking forward for to welcome you in Berlin and for your support and attendance for the YPs activities

Kindest Regards

Jomanah AlBtoush

YPFSC Chairperson

Jomanah AlBtoush
FIDIC YPFSC Chairperson
Senior Lead Engineer/ Senior Manager-
Arabtech Jardaneh–Jordan

Jomanah is an active Young Professional (YP) in FIDIC since 2011, she is YPFSC chairperson since September 2016 working on activating YPs role and reflecting their spirit and point of views in FIDIC community.
Also she is a member of FIDIC Risk, Liability and Quality Committee (RLQC) and subcommittee's member in Sustainable Development (SDCom) and Contracts (CC) Committees.
She is a strong advocate for FIDIC programs and initiatives in her region.
Jomanah is a Senior Lead Engineer and Senior Project Manager. She holds MBA and B.Sc. in Civil Engineering. She is certified in (PMP Professional, GPM-b, Carbon Reduction & GHG Manager (CRM), Six Sigma Green Belt (CSSGB), Train of Trainers (ToT))
Jomanah has about 15 years of significant experience in working in different aspects of consultancy services through being an integral part of many large and distinctive infrastructure projects in MENA region. Also she has an extensive knowledge in contracts based on different modules, quality management, environmental and sustainability fields.

TABLE OF CONTENTS

FIDIC Young Professionals Programme

FIDIC Young Professionals Symposium *Session 1: Engineering the Future of Consulting Engineering* Sunday 9th September 2018 **10:00-11:45**		
Time	**Title**	**Name**
10:00-10:05	Introduction	Moderator: Michael Walker Division Manager, McElhanney -Canada
10:05-10:15	Welcome Message	Dr Nelson Ogunshakin OBE FIDIC Chief Executive Officer
10:15-10:25	The Reflection of YPFSC in 2018	Jomanah AlBtoush YPFSC Chairperson/ Senior Lead Engineer & Project Manager- Arabtech Jardaneh -Jordan
10:25-10:35	Sustainability & Innovation In Urban Mobility	Yolan Pillay, PrEng -Transportation Planning & Urban Mobility – South Africa
10:35-10:45	Women in Engineering	Dr. Elisa Maceratini. Project Manager, Architect and Urban Planner, KEIOS - Development Consulting – Italy
10:45-11:00	Management Of Infrastructure Projects & Lean Construction As An Innovative Management Solutions	Dr. Ahmed Stifi, Senior Consultant & Project Manager, Codema International GmbH- Germany & Peter Matthes, Director of International Projects/ Head of the branch office in Dresden, BPR Dr. Schäpertöns Consult GmbH & Co. KG. The BPR Group -Germany
11:00-11:10	The Use of Technology in Smart Cities	Dr. Cosmin Tobolcea General Manager, Pro Toby- Romania
11:10-11:45	Q&A and Closing	

Session 2: Future Leaders Workshop **Sunday, 9th of September** **11:45 – 13:00**		
Time	**Title**	**Name**
11:45—12:15	Future Leaders Workshop by YPMTP Participants	Moderator: Steen Frederiksen, FIDIC YPMTP Mentor
12:15-12:25	Q & A	Moderator: Steen Frederiksen, FIDIC YPMTP Mentor
12:25-13:00	YPMTP Certificates	by Alain Bentéjac, FIDIC President Steen Frederiksen, FIDIC YPMTP Mentor

YPs Technical Tour Sunday, 9th of September 15:00 to 16:30		
Time	**Details**	**Notes**
15:00-16:30	YPs Technical Tour to Main station of Berlin Sponsored by: Codema International GmbH	• Assembly point: Inter-Continental Hotel (conference venue) entrance at 14:00. • Participants will reach the main Station via Tram, which will stop directly inside the main Station. • An office for industrial heritage in Berlin will guide the Technical Tour. The Technical Tour will offer an insight into the Berliner Main Station to highlight the history of the project from foundation until today.

FIDIC YP Meet & Greet Sunday, 9th of September 18:00 – 19:00		
Time	**Title**	**Venue**
18:00-19:00	FIDIC YP Meet & Greet	Gartenlounge in the lobby level of the InterContinental Berlin Hotel.

Future Leaders Outlook Tuesday, 11th September 2018 16:15 -17:00		
Time	**Arrangement**	**Name**
16:15-17:00	Welcoming & Introduction by Moderator	Jeshika Ramchund Senior Engineer-Developments- Bosch Projects (Pty) Ltd- South Africa
	Speaker 1	Cory Wilson, Division Manager, McElhanney -Canada
	Speaker 2	Wafaa Balla, Contract Administrator, TEKNO Consultancy-Sudan
	Speaker 3	Adam Bialachowsk Managing Partner- Vintage Consulting-Poland
	Discussion & Closing	

For the final program please check:
http://fidic2018.org/en/conference/conference-programme

An Introduction To Our 2018 YP Booklet: The Coming Change In Our Industry and Why Generation Y Have the Keys to Executing It.

By Adam Bialachowski –Poland

It is our honor as Young Professionals to have this platform to share with you are thoughts for the coming changes in the industry.

To increase efficiency and decrease price in consulting services, procedures, automation and mobile technologies are the only way. What should give food for thought to our industry is a July 24, 2017 article by Megan Beck in the Harvard Business Review titled "AI may soon replace even the most elite consultants".[1]

This is, of course, a while away but we already see this happening on the Polish market. Process flows for decision making and administrative procedures are being introduced to mobile software that allows contractors, clients and consultants to monitor the building process, budgets, optimize subcontracting, write correspondence and update their plans all simultaneously using a device as small as their phone in the palm of their hand. There is a great role and opportunity here for Young Professionals. We mainly represent what is known as the Y Generation. It's a synergy of new available technologies and characteristics of this generation that will produce a revolution in how business is conducted on the construction market. Despite the downsides this is a tech savvy generation, that enjoys work life balance and work from home[2], which automatically forces us to find efficiency in how things are done.

As more and more Generation Y employees are reaching management positions, we can expect that this new way of working using these new tools with become a priority for companies to implement, with this naturally our industry will change from the traditional on-site, paper, customized approach to on-line, mobile, electronic and automatic. It is in our hand to notice this change and leverage it in our businesses and in improving life. The Uber of consulting engineering is right around the corner.

We hope you enjoy the below articles

Note about author:

Adam Bialachowski, Managing Partner at Vintage Consulting.

Adam is a graduate of Saint Joseph's University in the field of management and decision-making sciences. a Master's degree in management from Harvard University and a Master's degree in finance and accounting from Kozminski University in Warsaw.

Until the founding of Vintage Consulting, he had gained experience working as a consultant for KPMG in the United States and as a Member of the Board at B-Act Sp. z o.o. in Poland. Adam is an expert in the field of business management, project management, contract management, cash flow optimization in construction contracts, tendering, FIDIC contracts, claims strategies and employer relationship management. He has already led successful business transactions with international construction and engineering firms on large infrastructural projects.

He is a member of the FIDIC Young Professionals Steering Committee, and a member of the Standardization Committee of FIDIC's Polish Member Association - SIDIR.

He has broad international experience having lived in the United Arab Emirates, Turkey, the United States and Poland.

Privately Adam is a CrossFit Lvl 1 Trainer, enjoys a good book, wine and training his will.

---

[1] *https://hbr.org/2017/07/ai-may-soon-replace-even-the-most-elite-consultants*

[2] *https://www.ey.com/us/en/about-us/our-people-and-culture/ey-work-life-challenges-across-generations-global-study*

5G INTELLIGENT PARK IN MODERN CITIES

By: DONG Xun, XIAO Zi-yu, HAN Yan,YUE Qiu, SU Jian, YANG Xu, ZHAO Yuan, MA Hong-yuan, SHAO Yong-ping- China

Note about author:
Dong Xun (1987-), Male, Master, Engineer
China Mobile Group Design Institute Co., Ltd., Beijing 100080 Focus on research in network security and 5G network.

Informatization is the major trend of global economic and social development, and it is also a key way to promote the development of enterprises. More and more companies are aware of this and demand to build an intelligent park. Some companies have already cooperated with telecom operators to construct a 4G enterprise private network, but 4G networks do not have the deployment capabilities for flexible routing and on-demand virtualized private networks. In addition to the construction of private network elements, public networks are required to cooperate with the establishment of routing data, which not only has a great impact on the public network, but also results in a certain amount of investment waste because private network elements cannot be configured on demand. As a new generation of mobile communication technology, 5G can effectively support the construction of information infrastructure in the intelligent parks.

5G infrastructure provides customers SMART Routing, QoS Guarantee and Billing. It also offers MOBILITY. Generally, the communication needs of intelligent parks mainly include intelligent office, IOT monitoring, industrial control and safety production. The needs of intelligent office mainly refer to basic communication interaction(such as voice, SMS, mobile internet, etc.), data access control (for example, the game server access restrictions during working hours, a differentiated mobile data local bypass strategy between employees and visitors, the native access to mobile data inside and outside employees' campuses, and QoS guarantee, etc.), flexible billing (such as discounts for enterprise employees when accessing the campus, etc.), customized short messages (such as the campus welcome SMS, SMS in specific areas of the campus, etc.), customized operator names (such as operator-park) and so on. The needs of IoT monitoring mainly refer to the networking and data exchange of sensing devices and monitoring devices in the campus. The needs of Industrial control and safety production mainly refer to remote logistics control, industrial robots, precision industrial control and so on.

Based on the cooperation between the 5G operator network and the park network, a customized private network of intelligent park with rich scenes, security, and intelligence is created to meet the communication requirements of large bandwidth, low latency, and large connectivity in the park. According to the requirements, 5G applications in intelligent parks mainly include slice, edge computing, and on-demand mobility management. Through the slicing technology, People Network, Internet of Things, Industrial Control Network are isolated to adapt to ultra-broadband, large-connection, high-reliability and low-latency application scenarios. Through edge computing technology, large-data traffic is locally offloaded in the park and transmission delays is reduced. Through on-demand mobility management, a secure, convenient and customized network environment for the people and smart devices is provided in the park.

This section will take the 5G ultra-broadband network slice for People Network as an example to illustrate the specific implementation. According to the differentiated strategy of mobile data local bypass and the native access between employees and visitors, when the employee enters the campus, the mobile network

Traffic outlet switches to the park network gateway, and the Internet is accessed through the park gateway. After leaving the campus, the mobile network traffic outlet switches to the operator's gateway without any sense. The outlets of visitors' mobile network traffic is the gateway of operators inside and outside the park.

Operators perform differentiated billing based on differentiated traffic outlets, thereby realizing discounted Billing for employees' data traffic in the park. According to the 3GPP specifications, differentiated native access means that DNNs signed by all users cannot be changed, but the traffic exits of employees and visitors in the park are different. This requires that employees and visitors in the park use different SMFs (Session Management Function) and UPFs (User Plane Function). At the same time, in order to configure the campus policy flexibly, it is recommended to distinguish the public network policy from the campus policy and set independent PCFs (Policy Control Function) for the campus. Therefore, 5G ultra-broadband network slices need to include 5G network elements SMF, UPF, and PCF at least.

The 5G-based intelligent park solution meets the various needs of the park, and is in line with the direction of future network evolution. Faced with the scale of the tens of thousands of parks in the future, this program has broad market prospects.

ADVOCATING FOR THE SAFE MOBILITY OF THE POWERED TWO WHEELER; UGANDA IN FOCUS

By: Albert J.B. Muloiti- Uganda

Note about author:

Albert Junior Bumba Muloiti is a Civil Engineer, Multiplan Consulting Engineers- Uganda

Albert is based at the head office of Multiplan Consulting Engineers in Kampala, Uganda. The firm is a top notch provider of consulting engineering services including environmental, water and waste water solutions, urban and rural highway engineering, traffic and transportation engineering and structural engineering. During a career spanning more than eight years, Albert has partaken in a variety of civil engineering projects with a bias towards design, design review and construction supervision of highways. The latest of these projects concerned the rehabilitation of a 92.5 km stretch of highway by use of cold in-situ recycling technology; a procedure beginning to take root in the local highway construction industry due to, amongst other benefits, its cost saving potential. Albert holds a Bachelor of Science (Hons) Degree in Civil Engineering from Makerere University. He is partial apropos the transport sector with a marked interest in transportation safety as his article will testify.

He is also the chairperson of the Ugandan chapter of the Young Professionals Forum and looks forward to an engaging and interactive discourse both at the Berlin conference this coming September and at the GAMA conference in Kampala, Uganda, in May 2019.

INTRODUCTION

The powered two wheeler, more commonly known as the motorcycle, seems to be loved and loathed in equal measure, depending on which spectrum of the argument one comes from. What has never been in doubt though, is the fact that there has been a steep growth of motorcycle ownership in Uganda; perhaps there is more love than loathing for the two wheeler. As far back as the year 2000, commercial motorcycles/ motorcycle taxis (locally referred to as boda boda) manifested as one of the pronounced public transport services particularly in urban areas.

According to a 2008 case study investigating the impact of motorcycle growth in Africa conducted by Sub Saharan African Transport Policy Programme (SSATPP), motorcycle growth in Kampala was projected to have grown 58.7% per annum since 2007, the same study finding that by 2014, the motorcycle numbers had risen from the 15,979 they were in 2007 to 405,124.

This dynamic transformation is in response to the urban mobility needs where motorcycles have gained relevance as they provide a low-capacity transport mode for both urban and rural people. In essence, the motorcycle taxi offers a more affordable and convenient form of motorized transport.

Some of the factors that have favoured their growth include inadequate public transport services, liberalization and an insufficient road infrastructure. The growth, however, has had both positive and negative impacts, and again, depending on the spectrum of the argument one comes from, the negatives may appear to outweigh the positives.

The negative impacts of the growth include congestion of the city, inadequate infrastructure, road safety challenges, crime among the motorcyclists, health-related challenges and environmental consequences.

Amongst the negative impacts, the road safety challenges have and continue to make the deepest dents. In recent years, motorcycle crashes have been the highest growing crash type countrywide. The Annual Traffic and Road Safety Report by the Uganda Police for the year 2016 indicated that motorcycle fatalities between the years 2011 and 2016 doubled from 570 deaths to 1,170 deaths, representing a 51.3% increase in the five-year period. In 2015 alone, 5,543 riders were seriously injured. A 2010 study assessing the Impact of Boda Boda (Motorcycle Taxi) Crashes on the Budget for Clinical Services at Mulago Hospital (Uganda's National Referral Hospital), Kampala conducted by Kigera et al revealed that at least 62.5% of the budget allocated to the directorate of Surgery at Mulago

Hospital is spent on victims of accidents involving motorcycle taxis. The burden imposed by the negative effects of increased motorcycle traffic is indeed staggering. The loathing of the two wheelers undeniably justified by the preceding statistics.

'MAIDS – Motor Cycle Accidents in-depth study' is a motorcycle crash causation study that was released by the European Commission in 2004 which discovered that environmental conditions – including roadway design, among other things – were the third largest contributing factors to crashes. The study discovered that human error is responsible for the vast majority of crashes, but notes that multiple precursors can lead to these errors. Driver and rider behaviour are therefore more significant factors in the number of fatal motorcycle crashes than roadway design. Nonetheless, roadway design that mitigates the risks faced by vulnerable road users (pedestrians and non-motorized traffic) and motorcycle traffic, still plays a vital role in road safety management.

DESIGN IMPROVEMENTS

In general, motorcycles have not been explicitly considered in roadway design practices in Uganda. Guidelines accommodating motorcycles do not exist which is ironic considering that they contribute the lion's share of motorized traffic. Roadway design and maintenance aspects such as the shoulders and drainage, curves, traffic control devices, pavement conditions revolve round vehicular traffic yet their effects are felt more acutely by motorcycle riders.

The suggestions presented hereafter are focussed upon the urban road environment, but many of the aspects overlap with rural road environments as well.

In the Greater Kampala Metropolitan Area, the motorcycle taxis (boda boda) which form the vast majority of motorcycle traffic, as their name suggests, are primarily used for commutes. Designing for motorcycles in Kampala must therefore consider how effectively their passage through traffic can be made safer. Riding past slow moving or stationary traffic, a process referred to as 'filtering' by the Transport for London Urban Motorcycle Design Handbook, allows motorcyclists to make progress in traffic queues and is a contributory factor in making them a convenient choice for transport within the urban environs.

The constrained carriageway widths available, complex network of streets, the requirement to share the limited space available with a large number of other road users and generally lower speed limits are some of the factors perhaps unique to the Greater Kampala Metropolitan Area that make motorcycle taxi usage preferable.

The motorcyclists filter in between or on either side of four wheeled vehicles in a traffic queue. A design that restricts these movements e.g. due to inadequate lane widths, will inevitably lead to conflict of motorcycle traffic with other road users (pedestrians, cyclists) as the motorcyclists tend to illegally invade the pedestrian walkways.

1. PAVEMENT CONDITIONS

It is important to consider the factors that affect grip or traction. These include road defects, certain types of surface materials, thermoplastic road markings, service covers and surface debris.

A thorough regime involving the inspection and repair of road defects should be implemented to minimize the risk that these defects pose to the stability of the motorcyclists.

Designers should strive to ensure that the surface material is uniform. However, the nature of urban roads necessitates a break in uniformity with paving blocks, cobblestones to mention but a few. This break results in a change in skid resistance, usually for the worse and is thus a risk factor to the stability of motorcyclists. Where a break in surface material uniformity is required, designers should strive to locate them at points along the routes where the motorcyclists are not required to make turns.

Thermoplastic road markings do not have the same skid resistance as the surrounding pavement surface. Once again, this break in uniformity of the surface poses a threat to the safety of the motorcyclist. Designers should place road markings in advance of bends or junctions rather than within them such that motorcyclists are not faced with a change in skid resistance at a point they are required to make a turn. Designers should also specify road markings that have a skid resistance as close as possible to that of the surrounding pavement surface material.

Service covers and or manhole covers should be located away from bends and junctions. Designers should also try to keep them off the carriageway as much as is practical. However, in situations where they have to be included in the carriageway, the designer should specify those that have a high friction surface, similar to the skid resistance of the surrounding pavement surface material. The surface of the covers should flush with the pavement surface to avoid a break in surface uniformity that creates a hazard for the motorcyclist. Vandalism of these covers is a persistent menace in the Greater Kampala Metropolitan Area. A rigorous inspection and maintenance regime of these covers is just as important as finding methods of minimizing the vandalism. Gaping manholes are an endemic scourge in the Greater Kampala Metropolitan Area that put the lives of pedestrians, cyclists and motorcyclists at great risk.

2. VISIBILITY

All round visibility plays a key role in improving motorcycle traffic safety especially at junctions. 'Failure to give way 'collisions take place at junctions due to impaired sideways visibility. Contributory factors to this include road furniture obstructions (traffic signal equipment, bus shelters, billboards, sign posts, vegetation) which easily mask the small frontal area of motorcyclists making their visibility difficult. Designers should locate road furniture in such a manner that visibility splays are unencumbered.

In the same vein, the designer should attest that the minimum Stopping Site Distance is equal to the minimum forward visibility to permit timely detection of hazards. This also implies that forward visibility should be free of the obstructions already mentioned under sideways visibility.

3. ROADSIDE FEATURES

Roadside features such as street light posts and road sign posts are a potential hazard to motorcyclists if struck. To make them more forgiving, it is imperative that the designer specify frangible posts which are not as rigid on impact as the ordinary type. Also, the designer should impose the use of flexible bollards should they be required and more forgiving crash barriers.

CONCLUSION

All road users require consistent sensitization on adaptation of safe road user habits. Inappropriate driver and rider behaviour, as already mentioned, is the leading cause of motorcyclist fatality on Uganda's roads. It is not uncommon to find a motorcycle loaded with four or more passengers. It certainly is not quantum physics to anticipate the havoc that such overloading poses to the already delicate centre of gravity of a powered two wheeler. Drivers of four wheeled vehicles should in tandem be encouraged to be conscious of the presence of their two wheeled counterparts and avoid distractions that dampen this alertness.

There is need to develop a motorcycle design handbook tailored to Uganda's conditions. This handbook would serve as a reference to designers, policy makers, road users and all stakeholders in matters concerning powered two wheelers. It would help to place the specific needs of the motorcyclist in the road development agenda with the overall aim of improving Uganda's appalling road safety record. This can only serve to complement the United Nations' General Assembly proclamation of the period 2011 to 2020 as being the Decade of Action for Road Safety.

HOW INDUSTRY PARTICIPATION CAN ENHANCE YOUR CAREER

By Cory Wilson-Canada

Note about author:
Cory Wilson is a Sr. Transportation Engineer and manages McElhanney Consulting's Transportation Planning Division in their Calgary, Alberta, Canada office.
Cory has thirteen years' experience in transportation planning and road safety. He has been a member of the FIDIC YPFSC for four years and is also a member of the FIDIC Business Practice Committee. Cory's area of interests include active transportation, road safety, smart mobility, and autonomous vehicles.

I recently had the opportunity to present to a group of young professionals on the benefits of volunteering with industry associations. These groups might include technical associations (e.g. Institute of Transportation Engineers) or a professional group, such as FIDIC. There are many different associations out there depending on your field of practice and geographic location.

Having been involved with several different industry associations, I have experienced numerous benefits to my professional career and personal life and it has also benefited my firm. I have realized that many of these benefits may not be initially obvious to young professionals entering the industry. I hope to cover some of these advantages in this article for the benefit of others.

Professional Career

Knowledge Transfer: There is clearly a lot to learn from participation with industry associations. The formal learning through courses and conferences are obvious, but there is also a lot that can be learned by working closely with industry colleagues, including technical and professional knowledge transfer. By working with highly motivated individuals, you can develop mentors within your own demographic rather than relying only on the traditional senior/junior relationship.

Professional Network: When involved with industry associations, you will work collaboratively with your peers, which may include competitors and clients. Working alongside clients has clear benefits as establishing relationships with the people that you work for, or want to work for, makes it easier to secure and deliver on projects.

Getting to know a client outside of a project relationship allows you to learn about their objectives, priorities, and communication style prior to working for them. Working with competitors also has advantages as it helps you develop an understanding for what is happening in your industry. Furthermore, there may be opportunities to partner in the future and one day they could move to become a client or join your firm as a colleague. You never know how your relationships will evolve as your careers progress.

Career Progression: Industry participation can help progress your career. Both of the factors discussed above will make you an excellent candidate to transition into the next role in your career. Industry participation is also a great indicator of a positive work ethic and passion for your career and the knowledge gained will help you be successful in your new role.

Personal Life

The benefits of industry participation extend beyond just your professional career and extend into your personal life. Through my years of industry participation, I have developed some lifelong friends from all over

the world. I have also had the opportunity to travel to some amazing international destinations to participate in conferences and meetings. The experience of volunteering is also very rewarding and has given me the feeling that I am participating in my career, rather then just having a job.

Corporate

Your involvement in industry associations can be a great benefit to your firm. It can be particularly useful when seeking new recruits. Through your industry involvement, you will develop a good understanding of the skills and reputations of others in the industry. Your relationships with others can also make a convincing reason why they would want to join your firm when looking for new opportunities.

I have had tremendous success hiring individuals that I have met through industry participation as I was already aware of their strengths and likelihood for success. This may not seem relevant in the earlier stages of your career, but as your career develops you may take on the role of hiring team members, or at least having a say in who would be a good candidate. Your success will likely be tied to the success of your team, so it is in your best interest to help build the best team possible.

Another benefit for the firm is retention. By supporting individuals in their roles with industry associations, it shows respect and appreciation. That goes a long way towards job satisfaction and dedication to the firm, something that is hard to match through salary or other employee benefits. Finding and replacing good employees is very costly and could ultimately have an impact on the firm's success.

THE USE OF TECHNOLOGY IN SMART CITIES SMART WATER WITH SMART TECHNOLOGIES

By Cosmin Tobolcea -Romania

Smart cities are no longer the wave of the future. They are here now and growing quickly as the Internet of Things (IoT) expands and impacts municipal services around the globe.

The smart city industry is projected to be a $400 billion market by 2020, with 600 cities worldwide. These cities are expected to generate 60% of the world's GDP by 2025, according to McKinsey research.[i]

By the year 2050, the United Nations predicts global population will have risen to an astounding 9.8 billion people. [ii]While our population surges, a dramatic relocation is occurring, drawing individuals from rural areas to urban hubs. The drivers of this migration—economic opportunity and quality of life—will bring an estimated 70% of the global population to cities by the time we reach 10 billion human beings, according to the Population Reference Bureau. This means literally millions more people inhabiting the same cities we live in today; where networks like energy, transportation, and water treatment and distribution are already stressed. We can also expect the emergence of an expanded global middle-class, set to deservedly become prosperous consumers. To support this kind of population density, cities around the globe are going to require major improvements to infrastructure and efficiencies.

"Smart Water" is one of six components that define a smart city; the others include energy, mobility, buildings, public services and integration. The goal of these efforts is to make the city more sustainable and efficient, according to Water World, and effectively improve quality of life. As we update and invest in our water infrastructure with more internet-enabled tools, and a wealth of data becomes available, it is vital that these networks communicate with one another. This will allow for not only the measurement of important indexes such as reservoir and groundwater supply, and triage of infrastructure updates, but will improve efficiencies across water-related disciplines.

Urban development is a huge opportunity to create resilient and liveable cities. The world is expected to invest around US$90 trillion in infrastructure over the next 15 years. These investments are needed to replace ageing infrastructure in advanced economies and to accommodate

Note about author:

Cosmin Tobolcea, PhD.eng.ec. is a General Manager at PRO TOBY - Romania

Cosmin has graduated his PhD. in Civil Engineering at Iasi Technical University from Romania and has over 13 years of experience in project implementation in Romania and abroad (Republic of Moldova, Hungary, Poland etc.). He was involved in many projects as an engineer-supervisor and consultant/advisor in the field of water and wastewater infrastructure. He published 17 papers in the last years at different technical international conferences from Romania, Italy, Spain, Japan, Morocco, Bulgaria, Poland, Indonesia etc. Also, he is a co-author of 11 technical books in the field of engineering and consulting for water & wastewater infrastructure.

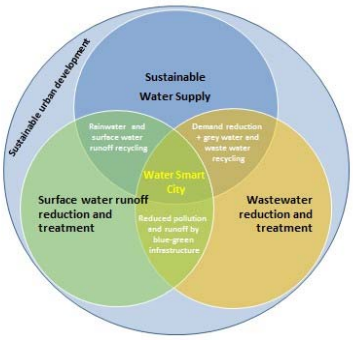
Currently he is the General Manager of Pro Toby, one of the leading engineering and consulting companies in Romania providing services of planning, design, consulting and management of water and wastewater infrastructure, working on FIDIC contracts (Red & Yellow) for projects financed by European Union.

He is also the Vice Chair of the FIDIC Young Professionals Steering Committee (YPFSC) and also a member of FIDC Sustainable Development Committee and a vice president of ARIC (Romanian FIDIC MA).

growth and structural change in emerging markets and developing countries (Global Commission on the Economy and Climate (GCEC), 2016).

Water Smart Cities

Urbanisation and the impact of climate change call for a new approach to urban water management. We need to find ways where the freshwater resource is cared for in a sustainable way that allows future generations of urbanites to have access to clean freshwater, and where the built-up area of the city with all its physical assets can last and function despite a more extreme climate. Our cities are designed to drain rainwater and waste water outside the city limits, and to import water from rivers and well-fields far outside the city. But every drop of water has a value, and the city should only take a fair share of the locally available freshwater resources. Cities should be considered as catchments. By treating all types of water as a valuable resource, new approaches and opportunities arise; both directly in terms of preserving the freshwater resource and obtaining climate resilience, and indirectly in terms of creating more liveable cities by linking the new water infrastructures to aesthetical and recreational benefits. The idea of the Water Smart City approach is to exploit these opportunities in a smart way. [iii]



The Water Smart City (WSC) approach integrates urban planning and the urban water cycle and makes a good business out of it for society as a whole. The concept includes integration of stormwater, groundwater, waste water management and water supply to cope with societal challenges related to climate change, resource efficiency and energy transition, to minimise environmental degradation and to improve aesthetic and recreational appeal. This approach develops integrative strategies for ecological, economic, social, and cultural sustainability. Systemic WSC innovation opportunities and thus possible positive business cases are mainly achievable in the overlap of the three segments of the urban water cycle (i.e. water supply, surface water runoff and wastewater).

Access to clean water is a growing challenge for urban communities in the face of climate change. Making matters worse, much water is lost before it reaches consumers' taps due to inefficient water management systems and aging infrastructure prone to leaks. Technological innovations offer hope for this sector, as smart water systems are designed to gather meaningful and actionable data about the flow, pressure, and distribution of a city's water, which can be used to better serve customers and prevent losses. Developing newer and smarter products and services around smart water management is our best bet in reducing massive water losses in pipes and shrinking overall water consumption.

Smart Technologies are highly efficient, interdisciplinary technologies that enable a step change in the water domain. Intelligent Sensors and steering devices enable to operate the infrastructure in a more flexible manner in changing urban settings. They can include e.g. process or information technologies at varied levels of technology readiness. Smart sensors form the backbone of the products and services within the smart water opportunity space. Smart sensors on pipes and other critical water management infrastructure have the ability to detect leaks, measure water-related data, including rainfall, pH, temperature, turbidity, flow, pressure, and even contamination levels. As internet of things devices, smart sensors are Wi-Fi enabled, allowing data to be sent in real time to cloud storage. Therefore, to be truly effective, smart sensors are integrated with advanced software systems capable of handling and managing these large datasets in real time. In doing so, municipalities can utilise this data to improve service, stop leaks, and boost efficiency.

CONCLUSION

Water is main resources and basic things for all. But, when using water, user does not know how to maintain properly. Suppose, the user does not waste any water, it leads to the possibility of safeguarding the

environment. Water usage may vary based on climate change, water sources, uncontrolled water supply that results inadequate water to users, industries with difficult economy planning and higher investment risks. Thus, the proposed system has a cutting edge to the smart city environment in providing the needed water supply to each and every house.

Overall objectives are to increase efficiency, (in terms of cost, energy and resources) of process and information technologies applied in the SMART Water priority areas.

References

Urban world: Mapping the economic power of cities – McKinsey report -2017

https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html

Towards Water Smart Cities - Climate adaptation is a huge opportunity to improve the quality of life in cities - Tim van Hattum MSc. – Wageningen Environmental Research, Maaike Blauw MSc. – Deltares, Prof. Dr. Marina Bergen Jensen – University of Copenhagen , Dr. Karianne de Bruin – Wageningen Environmental Research

THE DUAL ROLE OF INNOVATION IN CAPACITY BUILDING FOR YOUNG PROFESSIONALS AND PROJECT OPPORTUNITIES*

By Jeshika Ramchund-Moonsamy-South Africa

For centuries, engineers have possessed the ability to deal with changes, possess adaptation capabilities and a fluency in logical thinking. The profession itself grapples with a multitude of its own challenges amidst the changing global landscape, the way in which we do business and the expectation of infrastructure delivery. Increased urbanisation and climate change puts additional pressure on natural resources, whilst energy, mobility and water challenges means that infrastructure delivery remains a moving target. As engineering professionals and custodians of the built environment, how can we rise to the challenges that lay ahead of us? Albert Einstein said, *"We can't solve problems by using the same kind of thinking we used when we created them"*. The answer lies in prioritizing innovation by changing what we do and how we do it, by changing mindsets and skillsets.

The dynamics of how we do business separates the disruptors from those who will be disrupted. Depending on where we find ourselves in the value chain, our ability to influence external factors is limited. So, if we look at the factors that we can affect, it means that we can influence our human talent and the operational efficiencies of the business by encouraging innovation at critical points for maximum impact. To demonstrate how we can do this, let's look at two common scenarios and how they can lend themselves to a positive outcome. I have used the base case for a South African firm, but the principles are replicable. If we compare how our workplace has changed in relation to the age profile of our engineering professionals (Figure 1 & 2), we see significant growth in the number of graduates entering the market, versus the growth and retention of senior professionals in the firm over the same period. This is easily seen with superimposed curves (Figure 3).

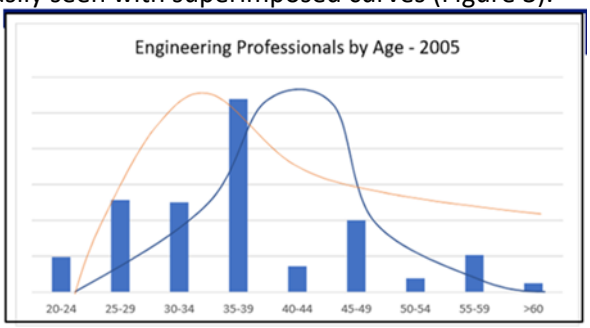


Figure 1: Engineering Professionals by Age – 2005

Source: DOL, Engineering Professionals: Crucial key to development and growth in South Africa, 2005

Note about author:

Jeshika Ramchund is a Professional Engineer employed as a Senior Engineer for the Developments Division at Bosch Projects (Pty) Ltd in South Africa. She holds a Bachelor of Science in Civil Engineering from the University of KwaZulu-Natal and has 10 years of experience in the planning, design and implementation of water and sanitation infrastructure projects. She leads a projects team that is responsible for service delivery of water and wastewater infrastructure.

Jeshika is passionate about the consulting engineering industry and the engineering profession. Jeshika is currently Chairperson of the Group of African Member Associations (GAMA) YPF, Member of FIDIC YPFSC, an Executive Committee member of GAMA and member of the FIDIC Conference Advisory Group.

Jeshika has been actively involved with Consulting Engineers South Africa (CESA) since 2008. Jeshika has served CESA in the capacity of Chairperson of the Young Professional's Forum, a Council and Board Member from 2014 to 2016.

Jeshika has delivered presentations at CESA, GAMA and FIDIC conferences and continues to enhance the role of young professionals in the Consulting Engineering space. Jeshika lives in Durban, South Africa.

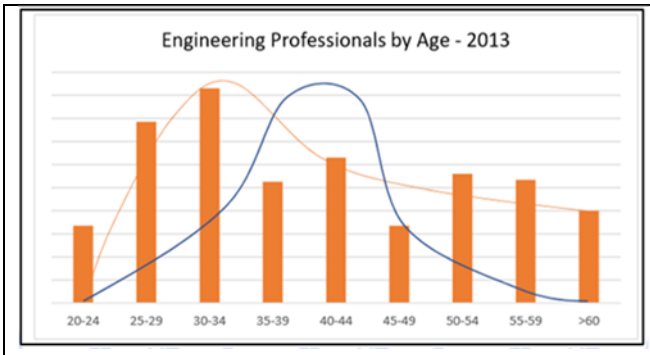


Figure 2: Engineering Professionals by Age – 2013
Source: ECSA, Dec 2013. Transformation Statistics. www.ecsa.co.za

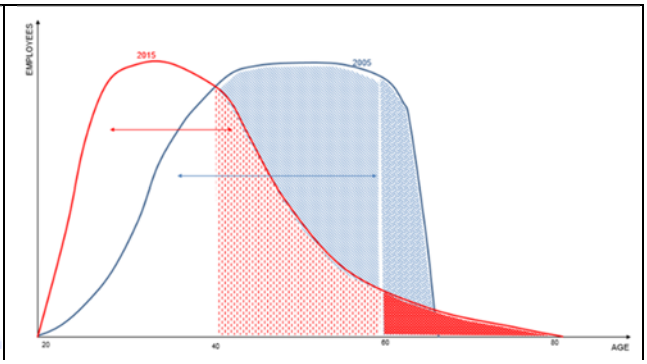


Figure 3: Engineering Professionals by Age – 2005 vs 2013 Superimposed

Scenario 1:
If we look at the dynamics within these numbers, we see that traditionally, a young professional would graduate from university and be mentored by a senior engineer within a company. They would largely be trained on the job on projects and supplement with external training courses. This hierarchical structure worked well and showed a manageable balance in the ratio of senior mentors to young professionals. However, current age demographics shows an increase in the number of graduates entering the workforce, creating a mismatch in the number of mentors available for the influx of graduates in the workplace. Typically, this mid-age band of professionals are the powerhouses of our firms, often in senior management positions, responsible for the order book, procurement, quality, managing risk and training. In addition, running projects, by bridging the gap between the retired professionals, brought back into employ of firms, and the typically millennial workforce who are eager to deliver but require supervision and mentorship. This stretches the senior engineer beyond healthy limits and as result, workplace training and mentorship suffers. 17

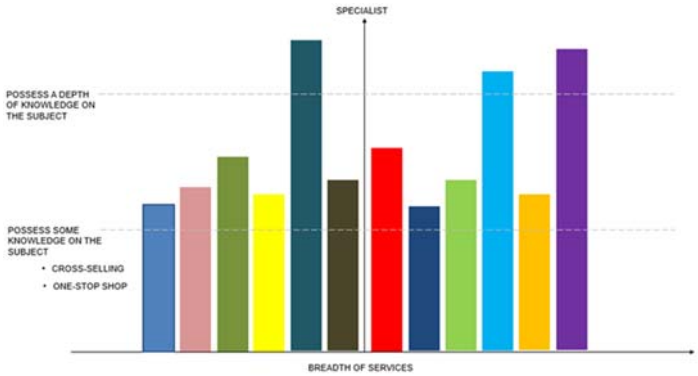


Figure 4: Multidisciplinary vs Specialist firms on depth and breadth of subject knowledge.

Scenario 2:
As a multidisciplinary business, the breadth of services offered are extensive at a generally average level, whilst in a specialist firm, the breadth of services offered are narrowly focused, with a very high level of speciality in a few niche areas as shown in Figure 4.

If we consider fee income as a function of time, up to a maximum for a percentage fee project, generally, some time is spent at the inception stage for finalisation of the project brief, in addition to the conventional services offered across the project cycle each firm builds in their competitive advantage.
How can we increase productivity and profitability whilst driving innovation in the way we work? Let's revisit these scenarios.

Scenario 1:
If we create a layer of pure non-technical managers, those who focus on the business - this will leave technical resources available for technical work on projects and for meaningful mentoring and knowledge sharing

whilst managers and commercially focused resources can address management and administrative tasks as shown in Figure 5. People perform best where they excel and enjoy being, Saddling a technocrat with management tasks and a manager with technical tasks creates a mismatch of resources resulting in the delivery of sub-standard projects and low project profitability. This further exacerbates the migration of talented professionals into other fields.

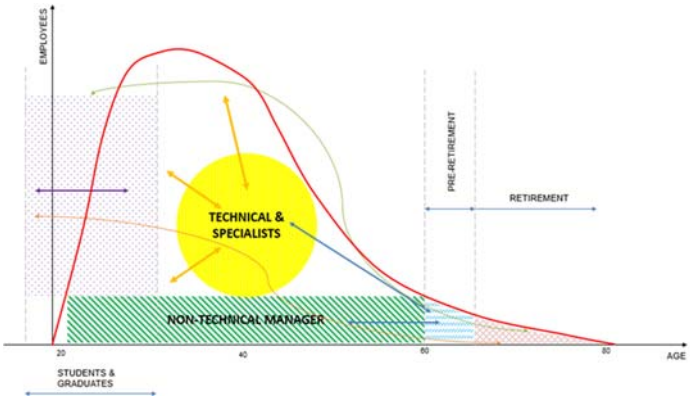


Figure 5: Modified Mentorship Model.

What do we do with the large numbers of the graduates (under 5 years of experience) in the organisation? For one, the skills pipeline needs to be rejuvenated at the start, by improved collaboration with tertiary institutions regarding the curriculum, application of theory to practical problems and an awareness of the global challenges a career in the built environment addresses. Whilst it is not accurate to label all senior professionals as resistant to change, overcoming the resistance to change, and the ease of incorporation of sustainability and innovation gets more difficult with increasing age. It's easy to default to the business as usual scenario, by applying the same principles project after project, and taking the road more travelled. Secondly, better workplace integration upon graduating will ensure that graduates are workplace ready. This can be achieved through a Mentorship platform – either at the level of individual firms with a project focus, at a Member Association level, a regional/continental level and ultimately a global level for knowledge sharing and on professional and personal development issues. Having the right people in the right place in the business and establishing a balance in the mentor to mentee ratio means that with empowered teams, audacious goals are reachable ones too.

Scenario 2:

The true cost of discounting fees or reducing fees below cost, can be demonstrated on a simple graphic in Figure 6. Offering a discount on fees, means that you must decide which services you do not offer for the appointment.

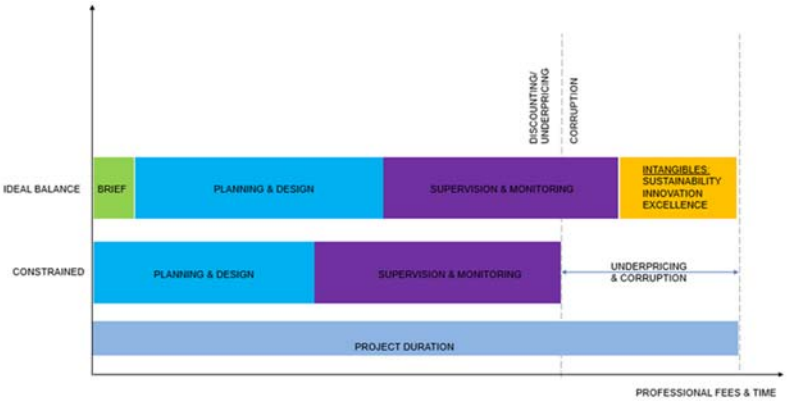


Figure 6: True cost of fee discounting and corruption.

This means you either assume what the client wants and skip the project brief and appraisal stage, or that you cut out value-add on the intangibles, such as sustainability and innovation initiatives, research and development and excellence from your business. Greg Satell, is a contributor for Forbes and The Harvard Business Review, and he has created *The 9 Rules of Innovation*, where he talks about the 70/20/10 rule that works on the basis of focusing 70% of resources in improving the existing business, 20% toward adjacent markets and 10% on completely new markets. Even with tight profit margins, the 70/20/10 Rule allows even the most constrained business to make room for innovation.

Conclusion

In a choice between Excellence and Innovation versus Average and Mediocre, we must ask ourselves, who we want to be and how we wish to operate. Harnessing the power of new technology is not negotiable with the impacts of BIM, Augmented Reality (AR), drones, The Internet of Things, Big Data as the backbone of SMART-everything. Small modifications to the processes/knowledge/offering can yield better profit margins either by having access to different types of work, but also doing the work you traditionally do, better and faster. Infrastructure delivery is about providing cost effective solutions that meets the needs of current users but also sustainable solutions to optimize the capital costs and maintenance requirements. **I**nnovation is not about discarding the old to make room for the new, smart businesses acknowledge that most future jobs do not exist yet and most future markets will evolve whilst we are preoccupied with the business as usual.

**Adapted from presentation made at FIDIC GAMA Conference 2018, Bamako Mali.*

LEAN CONSTRUCTION A BEST PRACTICE FOR MANAGING INFRASTRUCTURE PROJECTS

By: Ahmed Stifi and Peter Matthes- Germany

Infrastructure plays an important role in the development and economic growth of any country. Construction industry in general and its infrastructure sector in particular are not only mammoth but also very complex in nature. Because of the complexity, infrastructure projects like airports, roads & bridges, power stations, etc. are prone to various tribulations. Many Studies depicted that most infrastructure projects are associated with a state of tardiness and delay especially when we focus on the managerial aspects and the study of triple constraint (time, cost and scope). Figure 1-(a) below depicts percentage of delayed construction projects between 1993 and 2011 in India [1]. Figure 1-(b) shows the trend of cost and time overrun based on actual status of the under construction airport project (Berlin-Brandenburg BER) in Berlin [2].

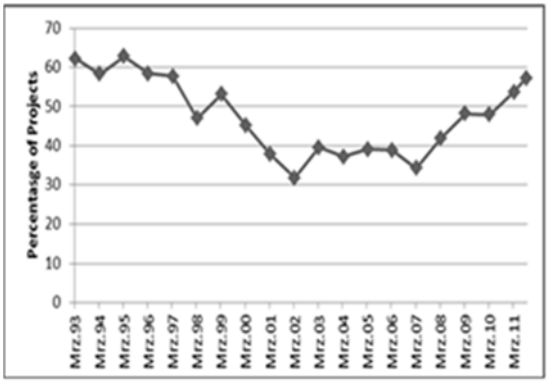


Figure 1(a): percentage of delayed construction projects India

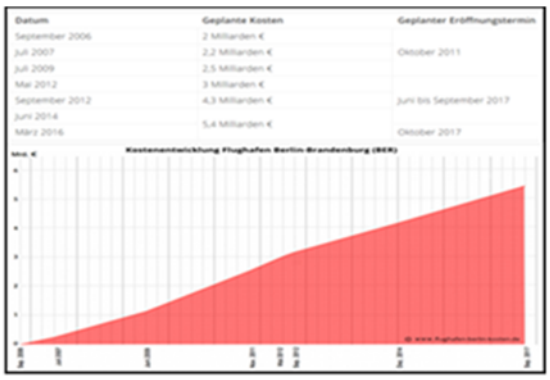


Figure 1(b): trend of cost and time overrun BER airport in Berlin

Note about author:

Dr. Ahmed Stifi is a Senior Consultant and Project Manager by Codema International GmbH in Germany.

Ahmed holds a degree of MSc. in Civil Engineering from the Technical University of Darmstadt in Germany in 2007. After 5 years of international work experience for CDM Smith at large-scale construction projects he attended the research team of Karlsruhe Institute of Technology (KIT) in 2012 as a senior research associate and lecturer at the Institute of Technology and Management in Construction. In 2017 he received his PhD degree in construction management with highest honors (summa cum laude) from the Karlsruhe Institute of Technology (KIT).

Ahmed is an active member of many engineering and international organizations, he is a member of the Association of German Engineers, member of the German Nuclear Society, member of the German Lean Construction Institute, and member of the FIDIC Integrity Management Committee (IMC).

While some institutes see the complexity associated with construction industry as a major reason for its problems, others like Lean Construction, refers to the wastes produced across the construction process as the prime reason.

Our paper deals with the concept of "Lean Construction" as a best practice in managing and delivering infrastructure projects. We will introduce the knowledge areas of Lean construction and its tools and concepts.

Lean construction is a comprehensive system of tools and concepts focusing on moving closer to customer satisfaction by understanding the process, identifying the waste and eliminating it. The simple definition of Lean Construction: "Lean Construction is a way to design production systems to minimize waste of material, time, and effort in order to generate the maximum possible amount of value." It has relied on the success of the production industry compared to the retardation experienced by the construction industry [3].Lean Construction Knowledge Areas [4]:

As per Lean Construction related concepts 8 knowledge areas to be worked to achieve infrastructure project objectives. These knowledge areas must be managed during the course of ongoing infrastructure projects. The knowledge areas of Lean Construction are:

1. Cost management
2. Contract management
3. Value management
4. Supply chain management
5. Design management
6. IT in Lean
7. People and culture
8. Sustainable management

Lean Construction Tools and Concepts [4]:

There are many Lean Construction tools and concepts which can be helped in managing each knowledge areas and also help in reducing the risks of a project being a failure and increasing value to the end user.

Note about author:
Peter Matthes holds a degree of MSc. in Civil Engineering from the Technical University of Dresden in Germany in 2000 and Master in Industrial Business Management in 2002. He is currently the director of international projects and head of the branch office in Dresden at the BPR Dr. Schäpertöns Consult GmbH & Co. KG. The BPR group operates worldwide and offers qualified specialist planning and integrated overall planning with interdisciplinary know-how. Through its corporate divisions Buildings, Infrastructure and Environment it renders consulting and design services in almost every field of construction engineering. Project management and construction management complement this scope of services.
Peter has more than 15 years extensive consulting experience in design and management of infrastructure projects in Germany and around the world. Peter is an active member of many engineering and international organizations, he is a member of the Association of Association of Consulting Engineers in Germany (VBI) and he is a founding member of the YP group within VBI, member of EFCA Young Professional Steering Committee and member of Saxony Chamber of Engineers.

Cost management	Contract management	Value management	Supply chain management
▪ Target Costing ▪ Target Value Design ▪ Activity Based Costing	▪ Innovative contract forms ▪ Alliancing ▪ Relational contracting ▪ Incentive system	▪ Value Stream Mapping ▪ Root Cause Analysis ▪ Value through user involvement ▪ Kano model	▪ Multi-item picking methodology ▪ Cloud computing ▪ Lateral transshipment ▪ Inter-firm cooperation ▪ Buffer management ▪ Logistic management
Design management	**IT in Lean**	**People and culture**	**Sustainable management**
▪ BIM ▪ Design structure matrix ▪ Design event simulation ▪ Modularization ▪ Set-Based Design ▪ Integrated project delivery	▪ ND modelling / BIM ▪ On-site 3D vision ▪ Simulation ▪ Web based information system ▪ Software as decision making tool	▪ Trust building ▪ Incentive system ▪ Learning / Training ▪ Change management ▪ Integrity management ▪ Leadership model	▪ First and last value model ▪ Subsidy allocation mechanism ▪ Energy-management perspective ▪ Green-lean model ▪ Process mapping

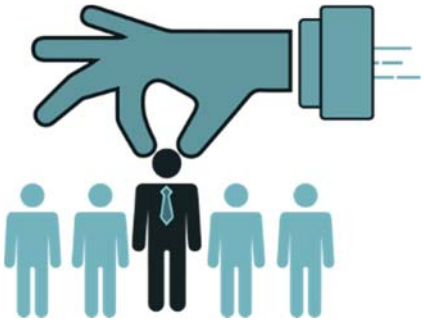
Based on McKinsey & Co "Proven best-practices rolled out globally" Lean Construction reduced cost by 10% and schedule by 40% in European tunnel project [5].

References:

[1] Bhawan, S. P and Marg, S. (2012) "MOSPI Annual Report (2011-12)" Ministry of Statistics and Programme Implementation, Government of India, New Delhi, India.
[2] http://www.berlin-airport.de/de/ber/index.php
[3] Koskela, L.; Howell, G. and Tommelein, I. (2002) "The Foundations of Lean Construction" Design and Construction: Building in Value, Oxford.
[4] Ahmed Stifi, Jyoti Singh, Sascha Gentes (2015): Build a Lean construction body of knowledge", International Conference on Civil, Architectural, Structural and Constructional Engineering in Dubai.
[5] McKinsey & Co. presentation within FIDIC 2015 Conference in Dubai.

QUALITY / QUALIFICATION BASED SELECTION – HIGHLIGHTS ON FIDIC GUIDE

By Wafaa Balla Beshir Ahmed-Sudan



Qualifications-Based Selection (QBS) is a procurement process established by the United States Congress as a part of the Brooks Act and further developed as a process for public agencies to use for the selection of architectural and engineering services for public construction projects. It is a competitive contract procurement process whereby consulting firms submit qualifications to a procuring entity (owner) who evaluates and selects the most qualified firm, and then negotiates the project scope of work, schedule, budget, and consultant fee –Wikipedia.

Quality Based Selection has also been promoted by FIDIC for many years, as it emphasises the importance of selecting Consultancy Firms on the basis of their qualifications, experience, professionalism and integrity, rather than price, if overall project value and quality is the Client's aim.

Everyone knows governments bid for projects considering certain amounts/ budgets for these projects, while bidding or tendering is not always the best system to select the best to perform the job, but we will never miss it if we hired a professional service provider by Qualifications-Based Selection process.

QBS aspects/ attributes where defined by FIDIC in QUALITY BASED CONSULTANT SELECTION GUIDE, which was published in September 2011 as follows:

- ✓ Professional Competence.
- ✓ Managerial Ability.
- ✓ Availability of Resources.
- ✓ Professional Integrity.

Note about author:

Wafaa Balla Beshir Ahmed is Contract Administrator at TEKNO Consultancy – Sudan.

Wafaa is an ordained Young Professional African engineer; and she was involved with FIDIC activities since 2013, she is a civil engineering graduate from the Khartoum University, Sudan. She has been awarded a Project Management Professional and the Risk Management Professional certificates from the project management institute (PMI), attended many professional, academic and professional training courses and workshops and she is a regular attendee for FIDIC International Infrastructure Conferences.

Wafaa is also a member at the FIDIC Young Professional Steering Committee and the Chairperson of the Newsletter and Social Media Subcommittees.

She is currently working in the project management office in TEKNO Consultancy, based in Sudan; she has also been involved in different community development initiatives, with special concentration on the role of the Engineers in community and life improvement.

In this guide FIDIC stated the advantages of the QBS system for Public welfare, Clients and Consultant, focusing on higher qualities, best values, confidence, innovation, excellence in service deliver and projects success as this system was applied. It was also stated in other studies that the QBS system advantages are as follows:

- ✓ Ensures cost-effectiveness
- ✓ Lowers risk for complex projects
- ✓ Results in better projects and highly satisfied owners
- ✓ Does a better job taking into account emerging social issues
- ✓ Encourages innovation
- ✓ Does a better job protecting intellectual property

- ✓ Does a better job building capacity of staff which work for the client-owner government

The guide also highlighted the disadvantages of Selection Practices Incorporating Price (PIPs), and it stated that PIPs do not deliver outcomes as good as those achieved using QBS. Such practices reduce the chances of getting the appropriate quality and best resources; and it will result in reduced value & services, loss of Capacity Building, Increase in Construction and Operation Costs, Time Extensions in the Construction Phase, and Potential Risks and Damages.

The guide also outlined the principles of fair and appropriate fee determination, and how the prices are negotiated in the QBS system along with differentiating between the supply of professional services and the supply of goods/works.

FIDIC recommends the use of standard agreements for engaging professional services. The preferred form of agreement is the FIDIC Client–Consultant Model Services Agreement - the White Book. Alternatively, standard agreements incorporating equitable conditions of engagement should also be acceptable.

FIDIC also recommended, that the maximum degree of transparency/ fair competition to be maintained during Consultant selection, and it advised the Consultancy firms to follow integrity management system.

FIDIC also draws the attention of Owners and Clients to the Life Cycle Cost of projects, and it endorses that it is in the interest of Clients as well as Consultants to limit the liability of the Consultant to a fair and balanced level.

However, it is commonly known that the Consultancy Engineering Industry is considered as first and foremost responsible for the planning, design, delivery and maintenance of the world's infrastructure and built-environment, this makes the sector a critical player at a time when the world faces an ever-increasing demand for food, water, sanitation, shelter, health services, transportation and energy. It tackles on a daily basis the problems of how to improve the quality of peoples' lives while working with finite resources in a world with a growing population.

The proper accomplishment and success of any project depends on obtaining the most appropriate capability a in terms of skill, knowledge, past experience, managerial abilities and reputation.

Quality Based Selection ensures the best overall project value. By matching scope of work to fee for Services, QBS ensures optimum value. QBS encourages design innovation, which will lead to overall cost savings and optimisation of Clients' value, as well as promoting state of the art practices.

References:

www.wekipedia.org

FIDIC Quality Based Consultant Selection Guide, September 2011

SMART PORT INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT

By: Italian YPF (Cosimo Carrieri , Elisa Maceratini, Giulia Menegotto and Eleonora Smargiassi)-Italy

Note about authors:

Italian Young Professionals Forum (YPF), with special efforts of:

- Eng. Cosimo Carrieri: Civil Engineer at S.J.S. Engineering,
- Arch. Elisa Maceratini: Architect, Urban Planner and Project Manager at Keios Development Consulting.
- Arch. Giulia Menegotto: Architect, Urban Planner and Project Manager at Keios Development Consulting.
- Arch. Eleonora Smargiassi: Architect and Project Manager at Lenzi Consultant s.r.l..

INTRODUCTION

As cities grow, infrastructure construction and management have never been more crucial for global economic and social development.

Due to the increasing urbanization, often critical financial conditions and the challenges posed by climate change, cities are facing major problems related to global development. What, then, is the role of smart infrastructures for buildings, for the development of solutions for mobility and energy management?

The massive demand for adequate infrastructure - such as energy resources and the organization of traffic and transport - entails the need to ensure better use of resources and lower emissions. It means smarter urban transport, more efficient ways of lighting and restoring buildings, and efficient energy supply and consumption.

In the wake of these experiences and in the path to the development of the innovations of the future, the port environment, which presents itself as an ideal laboratory for the development of applications for the intelligent management of goods handling, finds its natural place.

S.J.S. Engineering, an Italian company specialized in engineering services in the field of port infrastructures and maritime works in general, is facing the themes discussed below within several projects in Italy, in the Kingdom of Saudi Arabia and in other countries all around the world.

THE CHALLENGES

General overview about goods mobility and maritime transports in general:

- Current market demand and sustainability of the operators offer.
- Current issues related to port infrastructures.
- Increasing efficiency and productivity reducing significantly the environmental impact of the ports.
- Ports in the Industry 4.0 era: new possibilities to improve maritime transports.

According to the *Review of Maritime Transport 2017* (RMT 2017) by UNCTAD (United Nations Conference on Trade and Development) “in 2016, demand for shipping services improved, albeit only moderately”. In particular, the UNCTAD RMT 2017 stated that “world seaborne trade volumes expanded by 2.6 per cent, up from 1.8 per cent in 2015”. Furthermore, “UNCTAD forecasts world seaborne trade to increase by 2.8 per cent in 2017, with total volumes reaching 10.6 billion tons. Projections for the medium term also point to continued expansion, with volumes growing at an estimated compound annual growth rate of 3.2 per cent between 2017 and 2022”. In addition to the data mentioned above, it is necessary to consider two more fundamental aspects. The first one is that the trade and transportation of goods by sea today represents most of the global trade in goods.

Secondly, it is important to take into account the growth of the fleet (on a global scale) and the deployment of ships characterized by ever-higher capacity aiming to optimize the cost-benefit ratio of the transports (currently, the largest container ships built – e.g. the OOCL Hong Kong have a capacity of as many as 21,413 TEUs).

Therefore, container terminals operators have to adapt their services to ships and traffic volumes of such importance in order to be competitive in the current sea transport market.

The challenge to respond to current demands pertains to the construction of new container terminals but, even more significantly, to the adaptation of existing ones. The modernization of existing infrastructures, both in terms of structures and facilities (consolidation and reinforcement works, seabed deepening, revamping, etc.), both in terms of container handling processes management, is the most urgent theme and concerns a large number of terminals in the world.

Approaching the design, the modernization and the improvement of the terminals looking at the possibilities offered by the Fourth Industrial Revolution would be the way to remarkable results. The achievement of important goals, such as services efficiency with the benefits of economic and environmental sustainability, could be achieved by the exploitation of the new potentials offered by Industry 4.0.

NEW INTEGRATED TECHNOLOGIES SERVING PORT INFRASTRUCTURES

Highly automated process in container terminals and their impacts on goods mobility.

- Automated Guided Vehicles (AGVs) utilization.
- Improved IT systems serving Kiosk and OCR functions.

Highly automated process and the use of integrated technologies in container handling within container terminals would result in more efficient services.

Automated Guided Vehicles (AGVs) are used for rapid and precise container handling between the quayside and the container yard and can replace the traditional trailers and tractors used for the same purposes. These unmanned and automated vehicles are driven by an on-board navigation system and a transponder network embedded in the terminal pavement. The routes of the AGVs follow precise planned sequences, transmitted remotely via the computer control system. A further advantage that would derive from the use of these vehicles consists in the data recording by which it would be possible to monitor the work of the AGVs and optimize the routes consequently. There would be also numerous benefits in terms of energy sustainability and, therefore, in environmental terms. Diesel-electric powered or totally electric AGV units are now available in the market. In both configurations, a drastic reduction of pollutants and CO_2 emissions would be guaranteed, as well as a significant reduction in noise levels. In addition to this, reduced maintenance costs, high degree of recyclability of components and automatic and rapid battery change operations must be taken into account too.

The implementation of advanced IT systems and automation process should also be promoted to improve customs services and acceptance and control services. For example, the 3-in-1 integration of the Gate, Kiosk and OCR functions, often separated and distinct, with the support of dedicated IT systems, would guarantee

faster controls and acceptance procedures and, therefore, shorter waiting times and fewer incoming and outgoing queues from/to port areas.

GREEN PORTS

New technologies and renewable energy to reduce the environmental impact of ports (both commercial and touristic).

- Cold ironing
- Led lighting
- Solar power utilization
- Efficiency improvement of electrical powered equipment

The theme of the "Green Port" is actual and crucial and requires efforts to port operators to search for a balance between environmental challenges and economic demand.

The rational use of available resources, the use of technologies that have long been established on the market (e.g. led lighting, etc.) and the revamping of the equipment already in use, are just some of the measures that would be useful to achieve the mentioned economic and environmental sustainability objectives. But, despite this, solutions of this kind are not always implemented in ports.

In addition to the aforementioned AGVs, further and more specific measures can be applied to improve container terminals sustainability. The adoption of these measures, after appropriate cost-benefit analysis and proper planning, could lead to important improvements especially from the point of view of the energy resources management. Better administration of resources means significant improvement in sustainability of the infrastructure, both environmental and economic.

The modernization, the revamping or the substitution of the yard stacking cranes could be one of the possible solutions that terminal managers should carefully evaluate. For example, providing the terminals with the proper facilities, the most common fuel-powered stacking cranes, such as RTGs (Rubber Tired Gantry Cranes), could be replaced by electrically powered systems, such as eRTGCs (electrical Rubber Tired Gantry Cranes) or ASCs (Automatic Stacking Cranes) systems.

Another controversial topic nowadays concerns the Cold Ironing (or SSP, Shore-to-Ship Power) that would involve, not only container terminals, but ports in general. Cold ironing consists in the process of supplying electrical power from shoreside to a moored ship while its main and auxiliary engines are turned off.

The results of the implementation of Cold Ironing in a port are numerous, among which are certainly the reduction of the heat emissions produced by the ships, the reduction of emissions of pollutants in the air, the reduction of noise levels and the limitation of risks resulting from the operation of fuel powered machines.

CONCLUSIONS

The maritime transport market is evolving and the operators in the sector must respond to these changes trying to find an optimal balance between the market demand and the supply of more efficient, more competitive and, at the same time, environmentally sustainable services. Keeping in mind that the challenge concerns, in particular way, the modernization of existing infrastructures, this ambitious goal can be achieved by investing in the improvement of structures, facilities, resources and processes management and in integrated technologies with an open minded and smart approach. The fourth industrial revolution that the world is experiencing, places all economic operators in front of great challenges, but, at the same time, offers new solutions to face them.

SMART CONVENTION CENTER AND STADIUM UNDER 5G NETWORK

By: HAN Yan, XIAO Zi-yu, DONG Xun, YUE Qiu, SU Jian, YANG Xu,ZHAO Yuan, MA Hong-yuan, SHAO Yong-ping

Note about author:
HAN Yan (1978-), Female,
China Mobile Communications Group Design Institute Co., Ltd., Beijing 100080)
Consulting and Design Director, focus on research in network security and 5G network.

With the development of culture and economy, international meetings and events such as academic conference, product release meeting, trade expo, music concerts, sport competition are held more and more frequently. These activities have attracted thousands of people to gather in one convention center or stadium where the event is held, making these areas a hot spot for mobile communications within a short period of time, as well as placing higher demands on the telecom network capabilities. The number of people in the convention center or stadium is pretty large and a lot of mobile devices need to access the telecom network. This creates a significant tidal effect on telecom traffic in the area, requiring the network an adaptive and dynamic capacity adjustment function.

In traditional networks, this type of problem cannot be solved well due to the limit of communication standards and network architecture. If there is a sudden increase for the communication capacity in a fixed area, the only way to handle it is through temporary expansion or leaving enough redundant configurations in the early design stage. As a new generation of mobile communication technology, 5G (5th Generation) can better solve the tidal effects in telecommunication and provide users with better on-site communication experience, thereby effectively support the construction of smart venues. The following sections would analyze the important role of 5G in the construction of smart convention center and stadium from the perspective of intelligence and flexibility.

- **Intelligence: Automatically detect the mobility of people**

Network deployment solutions for large conferences, exhibitions, concerts, and other personnel-device-intensive locations have always been a difficult issue for telecom operators. If the mobility of people can be automatically detected, the needs of network expansion can be predicted in advance more easily. From the wireless access network, data such as user roaming status and user movement behavior can be collected. The IoT sensors in the parking lot surrounding the stadium can demonstrate the mobility trend of people. The support system of network can identify the mobility trends of people through the analysis of a series of data. This result can be used to generate an early warning of the tidal effect of telecom services. When the target threshold is exceeded, the expansion of the network will automatically start.

- **Flexibility: dynamic scaling of network capacity**

Taking Olympic venues as an example. Media personnel, spectators and athletes gather together on the competition day, which makes the hotspots a bursts of network traffic at specific times. The stadium is a "big traffic and high mobility" area and its bursts of telecom traffic may be several times as the usual, which forms a strong "tide effect". Such extreme traffic characteristics can’t be resolved thoroughly in traditional network design. Therefore, it is very common for network to be congested and inaccessible during large events. We are all supposed to have experienced slow data communication in large event venues such as unable to share pictures or videos on social media.

When designing a traditional network, it is not realistic to solve the "tide effect" problem through reserving a large number redundant configurations. For example, if the network configuration is configured according to the peak traffic, the utilization rate of equipment in the low traffic period on non-competition days will be greatly reduced, which will inevitably cause a lot of waste in investment. And traditional network only adopts dedicated equipment's, which means that network expansion also requires a lot of network configuration, therefore the implementation cycle is very long. In 5G, the core network architecture is based on NFV/SDN technology (NFV: Network Function Virtualization, SDN: Software Defined Network), enabling the dynamic scaling of network capacity more easily. In 5G, we can deploy flexible virtual routers and on-demand virtualized private networks in mobile core network. Therefore, there is no need to build dedicated network elements and modify lot of network routingd ata or other information .It would help us improve network capacity quickly and easily but reduce the costs in network construction. In a 5G network, network expansion and service deployment are implemented by loading software into a corresponding virtual machine. Under normal circumstances, hardware expansion and cutover work are not involved. Therefore, the expansion of the network can be achieved more quickly, efficiently, flexibly and intelligently. Even in a user-intensive environment, users can have a good online experience through fast and dynamic capacity expansion.

The reliable ability of telecom network has become a basic requirement for big events such as conferences, exhibitions, concerts, etc. Reliable and dynamic network capabilities are necessary factors for creating intelligent convention centers and stadiums. By taking advantage of 5G networks, it is possible to anticipate the trend of personnel gathering in active areas in advance and better carry out the dynamic expansion of the network. It can solve the tidal effects of traffic caused by the mobility of people. With the introduction of 5G networks, the construction of smart convention center and stadium will be even more effective.

STRUCTURED TRAINING – AN ESSENTIAL FOR A SUCCESSFUL YOUNG PROFESSIONAL.

By Jennifer Ojakovo- Estonia

Note about author:
Jennifer Ojakovo, Assistant Project Manager, HML Project Management OU. Jennifer had formerly worked as a mechanical systems designer at KOA Consultants Limited in Nigeria. She holds a B.Eng and M.Sc in Mechanical Engineering and is a certified Project Management Professional (PMP) from Project Management Institute. Jennifer has gathered more than 6 years' experience in design, simulation and modeling, tender documentation, construction project management and quality management system. She has had training and experience with developing QMS documents for certification and internal audit. She is currently managing building projects across the Lithuania, Latvia, Estonia and Finland.

How did it go wrong? Who was held liable? Did you claim responsibility and log these into your lesson learned file? Did it threaten your job or question your integrity? Did it result to lack of trust in your skills by client and employer? Did the outcome of your project or task cause you to doubt your capabilities at any time? Did you have anyone to turn to? Were you pre-equipped to handle such role?

These and many more are questions most young professionals ask themselves or must provide answers to, especially in new job roles. These are situation in which they mostly find themselves while working in an environment where training and mentorship is not considered important or even necessary in carrying out the task required for a job role. In such environment, it is usually the case that huge workload and tight schedules does not give much time for senior professionals to teach or guide the young ones. While time spent giving short presentations and lessons to a junior staff may sometimes seem unprofitable, it is undoubtedly a huge investment in human capital rewarding with capable staff, well distributed workload and ultimately, profit.

Some young professionals find themselves in work environment where they carry out their job functions by mostly self-study and training. In such situation, quality, employer integrity, cost, schedule and all other indicators of success in a project are at stake. Employers are encouraged, no matter how small the company may be, to consider and take seriously, proper introduction and development of staff especially young people at the beginning of their career. Even though self-study has and will always be borne out of self-motivation; to succeed and excel in a chosen career, young people must understand that they also need to reach out, ask and seek knowledge for this success.

Bring it here!

You are not alone. There have been collaborations and knowledge sharing among young professionals. Though, we are from different parts of the world, our challenges are similar - the dire need to succeed! The need to be acknowledged for our singular effort put in to achieve our team collective success. Other Young Professionals from different parts of the world have been in similar situation, succeeded or failed; **but learnt a lesson**! Such lessons are encouraged to be shared.

Reach out!

Young Professionals across the globe have been through similar situation. Learning how they succeeded could prevent a mistake in your work or project.

A personal success experience!

Having worked as a mechanical systems designer and now in construction project management, surrounded by professionals from other fields, my options for help on a design issue was limited. I reached out for help for alternative opinion on a subject in humidity control. It turned out my thoughts were right and confirmed. This gave me confidence to maintain my position on the subject with older professionals. While doing this, I felt that Mohammad Juaidy from Arabtech Jardaneh, Jordan and Ugan Mudali from Bosch Projects (Pty) Ltd, South Africa were standing with me. What a great feeling to know that you get help anywhere on a wide range of subjects.

Young Professionals Forum on national, regional and FIDIC level was established to collaborate and share knowledge.

Be sure!

The Young Professionals within FIDIC has and will continue to unify young people across the globe, share knowledge, build relationship across borders and be a proud model professional association for Young Professionals in the Engineering and Construction Project Management Industry.

So, my friends, what challenges are you currently facing in your work? Bring it here! How little or enormous do they seem? Gather here, lets discuss and ……maybe, take a selfie!

THE DEVELOPMENT OF KASHIWA CYBER PHYSICAL DATABASE TO INTEGRATE TIME–SPACE TRAFFIC DATA

By Sumihiro Sawabe-Japan

Note about author:
Sumihiro Sawabe
Working at CHODAI CO., LTD,
Position; Chief Engineer
Profession; Transportation Planning and ITS Design

In this paper, we report the status of development of the “Kashiwa-cyber physical Database" for “Regional Transport Information Feedback Systems” which is collected and processed the comprehensive traffic information which changes time-space. In addition, this system is intended for Kashiwa City, Chiba Prefecture in Japan.

1. Summary of Regional Transport Information Feedback Systems.

1.1. Background of the System Development.

Keeping the regional transport be sustainable and eco-friendly, ICT can take role to enhance human sense to city-wide scale and may change people's travel behavior. The concept of the ‘Kashiwa Regional Transport Information Feedback Systems' is to establish social feedback loop of regional transport information from measuring, processing and visualization to provision. Through the continuous traffic and environment monitoring, people may aware that the substantial effort can be accumulated to result meaningful improvement. We believe this awareness may encourage people's eco-conscious mind and will promise to establish low-impact transport society.

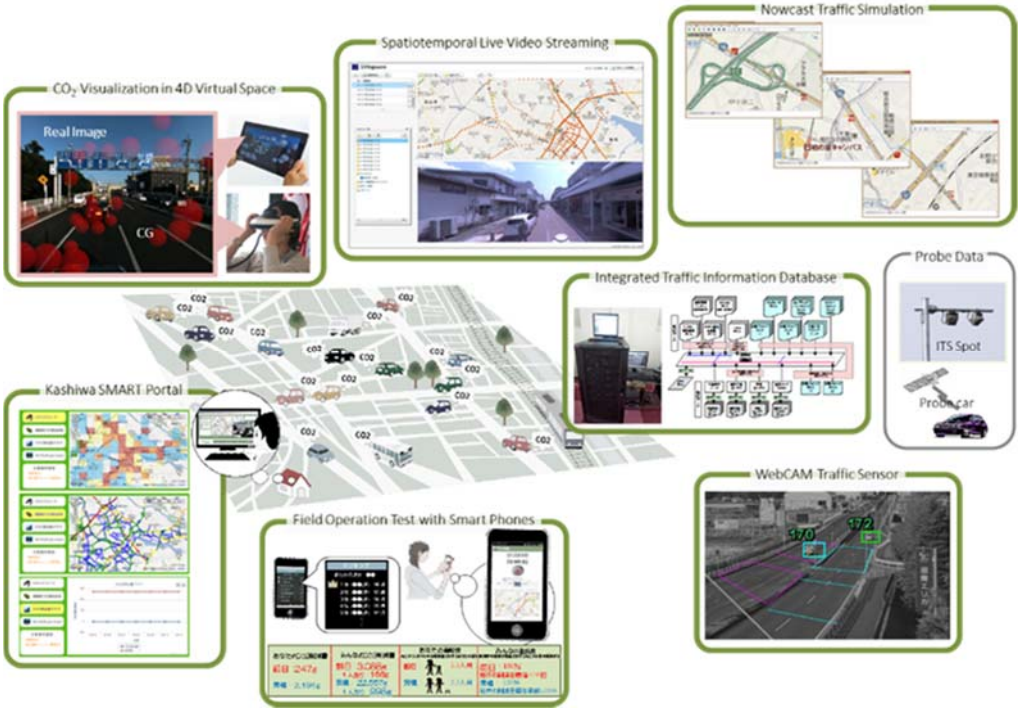


Figure 1. Concept of the Kashiwa Regional Transport Information Feedback Systems.

1.2. Positioning of This Database in Regional Transport Information Feedback Systems

Recent years, in addition to the information sensors that have been installed in the road or roadside, probe information is also collected, but there is no case that integration and collection data in a wide range of time-space at present. By constructing a database that combines data and continuous discrete these various, if complemented by simulation technology to time-space region that has not been directly observed, estimated

real-time detailed and traffic conditions in the real world on your computer that is possible. And if it is possible to fuse technology and virtual reality to it, to visualize the amount of CO2- emissions and traffic conditions, to provide citizens, promoting awareness of the aforementioned you can expect. A series of these systems is called "The sustainable and regional transport information feedback systems", and in this paper, we focus on describing the its database of "Kashiwa-cyber physical database".

2. The Function of Kashiwa Cyber Physical Database.

A technique to compile probe information and information from a traffic sensor and the monitor information from live images into a database on common space base and a function to accumulate information between the partial time-space are necessary for this database. Data of this database is intended to be used as input data for simulation Nowcast to improve the accuracy of the reproduction area traffic Kashiwa to face and comprehensive simulation model to estimate the complete traffic state. We developed the database technology which can be able to cancel different data contents and the difference in a period to integrate different traffic data in Kashiwa city, Chiba prefecture (spot traffic volume, OD traffic volume, the speed by the probe, travel time by the probe) and considered a stable and sustainable operative form.

2.1. Requirements of The management Method of Handling Data.

The traffic information database for the long-term traffic data fused with various spatial representations to accumulate the long term, this database must meet the following requirements: spatial axis and time axis.

- Space axis — A spot (point), a link unit (line), linkage between the data of the different spatial expression method such as the mesh (aspect).
- Time axis — Can be able to change over time in the cross section more than one time easily. Clarify the spatial axis version information (DRM, census, etc.).

For the multiple data origin of traffic volume and speed data, we basically compiled logical add (OR) and gave the classification of indicating the source of information. Moreover, in consideration of the development as the traffic circulation base, we assume a coordinate (latitude longitude) and the linkage with the DRM link as a basic policy. The DRM link assumed in second mesh and two DRM nodes (ascending order), direction indicated by the order thereof (0.1) are defined. The method to manage the time axis of the DRM link is keeping the column link of DRM version for 3 three generations in a 5-minute mesh corresponding to the target area provided. In addition, spot traffic volume data is collected from traffic data from the image sensors and the measurement data of the traffic counters of the traffic management and road administrators. We conduct the integrated processing data in month-year and types to integrate the format of spot traffic volume data (table name: det_agg_data). Furthermore, as a space axis of integrated processing of space axis, we set the sensor information with the ID as the key point (table name: det_info). By registering in advance link ID that corresponds to the latitude and longitude of the installation point, it was easy to handle in the form Nowcast simulation.

2.2. Examination of Database Server Configuration.

Handling received data management method described above, the server was basically arranged in accordance with the following functions.

- Reception server — We acquire the AVI data from traffic volume and the number plate sensor from a roadside image sensor by online. By data management requirements, date and the addition sources of information type are implemented.
- DB server — Setting the date and type of information sources when capture online data manually. Subjecting the differences version data (Correspondence and annual census of DRM ～ Correspondence table between the DRM). Stored centrally for all tables, including online data.

We have conducted a test of a prototype provides for about 30 monitors from November 24 2012. We expect to expand towards integration data further, especially promote the continuous adjustment of the probe towards the online data collection.

YOUNG PROFESSIONALS IN LATIN AMERICA

By Rodrigo Juarez-México and André Assumpção-Brazil

The success of the Engineering Consulting Sector, which we represent, depends directly on the intellectual capacity of its professionals. These professionals, when working together, allow the Sector to fulfill impressive projects. So, in this way, we can say that professionals are the biggest assets of all our companies. In this context, we have FIDIC acting as the Global Voice of Consulting Engineers, with the capacity to organize and put all together, creating a strong community.

Nowadays there is a major concern and a constant debate, perhaps in the whole world, on what will happen with the future of our industry. It is necessary to know, understand and debate which are the challenges of our future and how to solve them. Because of it, there is a great need to bring to this debate on the future of the sector, those who will be most impacted by the current challenges and potential changes: the young professionals.

The Young Professionals from across the world have one common goal: Improve the world in which we live. For all of us that are involved in the Consulting Engineering Industry, our goal is roughly similar: how to improve our industry, thereby improving the world we live in.

In particularly, the Consulting Industry in Latin America has been struggling with different problems. Regional growth is lower than what is happening in regions such as Asia and Europe. Poor level of GDP invested in Infrastructure compared with another emergent countries contributes to economic and social development beyond what is desired and necessary.

For example, from the point of view of Mexico, the country is currently facing a lot of changes, projects like the Mexico City New International Airport is creating a boom in the Infrastructure Sector. There is a major interest from different countries and foreign companies to invest and develop infrastructure, there are a lot of projects such as the Special Economic Zones, High Speed Rail infrastructure, Mixed Used Developments and many other Infrastructure Sectors, however, with elections coming up and with the high uncertainty of who is going to win, there has been a slowdown. The scenario is similar in other Latin American Countries. There is a great need for infrastructure development, but require the lead of by skillful and technical professionals that have the courage and the will to develop, but that are also willing to manage the changes that are yet to come.

Note about author:

Jose Rodrigo Juarez Cornelio (26 years old.

Civil Engineer by the Monterrey Institute of Technology & Higher Studies, Campus Queretaro (ITESM-2015). I also possess a Diploma in Project Management from ITESM Campus Santa Fe (2016) and completed the Young Professionals Management Training Programme 2017 (FIDIC). Currently, I am member of the FIDIC YPFSC, representing Mexico. Currently, I am working for the Project Management Office for the New Mexico City International Airport with PARSONS Corporation-FOA Consulting, in Project Controls, where I am responsible for the Change Register, Construction and Design Base Implementation Plans & Requested and Implemented Changes. The NAICM is the most important infrastructure project in America, which requires an investment of over 15 Billion USD.

In Brazil, the situation is worrying. The country is struggling to get out of one of its biggest economic and political crises. New scandals of corruption appear from time to time. As the firsts and largest scandals were related to large projects and public buildings so, the Engineering sector in general, and the Consultant engineering in particularly, were severely affected. We are losing many of our good professionals to other industries, such as banking for example, and wasting entire generations of fresh minds who are leaving the university and which are not capable of being absorbed by companies.

Despite the problems, the Consulting Engineering Industry in Latin America is full of skillful and well-prepared professionals that are ready to contribute. Besides, they have the support of the Pan-American Federation of Consultants (FEPAC), the MA's, and from FIDIC, to strengthen relations, promote the exchange of knowledge, thus empowering their companies and professionals.

One powerful tool to achieve these goals is the creation of Young Professional Forums in the same model of FIDIC YPF. In 2018, Mexico and Brazil have been pioneers in this topic in Latin America, encouraging the associated companies to appoint professionals to collaborate in the implementation of this project. The YP from FIDIC YPFSC, Rodrigo Juarez and André Assumpção are leading this initiative in National Chamber of Consulting Companies (CNEC Mexico) and the Brazilian Association of Consulting Engineers (ABCE Brazil), respectively.

More than that, with the support of FIDIC, they are disseminating the project to others MA's, encouraging them to create similar projects, as well as taking the first steps for the creation of a macro-regional Forum, a YPF for FEPAC. For this reason, they were invited by the Peruvian Association of Consultants (APC) and FEPAC to present this initiative to all regionals MA's during the event "Infrastructure of Peru, Latin America and the World" organized by APC, organized under the framework of their 50th anniversary, on May 9th, 2018, which also included the presence of FEPACs president, Eng. Angel Ferrigno from Argentina and Mr. Alain Bentejac, FIDICs president, from France.

The objective of this initiative was to allow and empower Young Professionals within the region to participate and get involved in the different activities that FEPAC has, which will also serve as the communication channel between FIDIC & the Latin American Region. In APC's event, they could stress the importance of having the participation of Young Professionals as the future of our industry, as the successors of the Consulting companies in which we develop and the importance of allowing the participation of YPs in such important events like the International Infrastructure conference.

The initiative was well received. Compromise from young Peruvian consultants was manifested. Colombia, Argentina and Paraguay also demonstrated their support to include YPs. Mexican and Brazilian senior

Note about author:

André Jabir Assumpção (32 years old), is an engineer member of FIDIC YPFSC. Also member of the Board of Directors of the Brazilian Association of Engineering Consultants (ABCE) and the National Association of Architectural and Consulting Engineering Companies (SINAENCO) in Brazil.

Today he is a partner-director of the company ECR Engenharia Ltda. His academic background includes bachelor degree in both, industrial engineering and civil engineering. In addition, he is a specialist in financial and controlling administration, and participated in FIDIC YPMTP.

professionals reaffirmed their commitment as FIDIC & FEPAC MAs. In general, the presentation caused a great impact, and they invited the participants to reflect and consider about the future of our industry.

In the case of Mexico, the initiative for the creation of a YPF was formally presented in an event organized and fully supported by the local CNEC, and completely supported by the president Eng. Alejandro Vázquez in February 8th, 2018. After that event, several meetings have been held with different companies, with the full support of CNEC, to involve the most number of Young Professionals. Our objective is to integrate a network of Young Professionals that are involved in different sectors of the Infrastructure Consulting Industry through the local MAs, who can propose innovative and sustainable ideas that proved added value to our industry.

In the case of Brazil, the initiative for the creation of a YPF was formally presented in a Board Meeting of ABCE at March 13th, 2018. The idea was immediately supported by the former president of ABCE and vice-president of FEPAC, Mauro Ribeiro Viegas Filho, precisely because he had appreciated the presentation made on February 8th in Mexico, cited above. Still, it is possible to say that Andre got real support from all the companies, just after the opportunity to participate in the Peruvian event. The invitation showed to the MA members the seriousness of the FIDIC's project and how it really encourages the participation of young people in day-to-day life, in decision-making and in events. Thanks to this, at May 25th, the first Brazilian YPF meeting success happened with the presence of almost 20 Young Professionals and continues to grow.

Our region faces several challenges for economic growth, which demand more and better infrastructure, as well as improved engineering for its development. Latin America is going through a lot of changes and has a lot of work to do to keep up with other regions of the world, but it is a region that has always been characterized for its strength against adversities, for the solidarity of their people and the enthusiasm of their professionals. The Latin America Consulting Engineering Industry is eager to prove its value to the rest of the world and, although there are still a lot of things to solve, the professionals involved in this sector have proved that we are ready to face the challenges that are yet to come, but overall, with the involvement of more Young Professionals, we can face these challenges, as future leaders of our Industry.

LEVERAGING TECHNOLOGY AND NETWORKING FOR PROFESSIONAL RESILIENCY

By Michael Walker-Canada

The Young Professionals Forum (YPF) has existed for almost one and a half decades, with the intention of introducing Young Professionals (YPs) to FIDIC with the intent of building the next generation of leaders. During this time, many topics have been presented at venues across the world, and the technology has constantly been advancing. One aspect that has remained constant throughout this journey however is the quality networking opportunities that these events have enabled for all attendees.

When looking at the topics that will be presented in our time in Berlin this year, with the broad theme of "**Mobility and Smart Infrastructure**" and the YP theme of "**Engineering the Future of Consulting Engineering**", I am reminded that there are limitations on the individual with regards to time and effort. One person can learn many things through self-study, but it is only when we collaborate with other professionals and those who think differently from ourselves that we can discover truly new ways to solve unique problems and multiply our knowledge. Through this networking, I personally believe that the attendees are investing in their own futures, and thus the futures of those that they will do work with, or work for. Clients are best served when the solutions proposed and implemented are truly pragmatic, not just what is readily available.

Resiliency is a term that I have found to be increasingly present when discussing careers in Consulting Engineering, but the term can take many shapes depending on the context. In the simplest dictionary definition, Resilience is *"the capacity to recover quickly from difficulties*", but when talking about careers, that could entail a number of difficulties. One example is with local market factors dictating investment in different forms of infrastructure, certain skills and knowledge may be required for a period of time, then not be required in that region for quite some time. Should a professional find themselves to be a "one-trick-pony", I believe that they will find it increasingly difficult to successfully market their services over the long term. Worse still, if they don't know that their skills are not going to be in demand, they have no opportunity to acquire new skills, or to relocate to where their skills are required.

"Network Resiliency" is a term that I came across in a book I read recently entitled "the startup of you" by Reid Hoffman and Ben Casnocha. I gravitated to this idea, in that as noted above, we can't possibly know everything about everything, as the new data is ever rapidly expanding; however through our networks, we can grow

Note about author:

Michael manages the Saskatchewan offices of McElhanney's Consulting Engineering group in Canada, and manages high profile, multi-disciplinary projects across Western Canada. he has consulting and construction experience over a large variety of projects where he has provided consulting services & construction management for infrastructure projects

Michael has worked with a diverse set of clients & stakeholder groups. Michael promotes effective communication from the start of the project which has allowed him to deliver a large number of successful projects on schedule and on budget through challenging conditions.

Having been involved with ACEC Canada since 2012, Michael was able to participate in 2016 YPMTP, and has been involved with the YPFSC since 2017. He is a strong advocate for FIDIC programs in Canada, and is working to increase Canadian participation and networking through the promotion of the YPMTP. He has shared his Canadian experiences with the FIDIC groups, and takes his international networking skills back to Canada to help grow the YP through multiple presentations & publications.

Michael has received multiple awards recently for his contributions to the community and the consulting industry, including the 2017 ACEC–Saskatchewan Young Professional Award, the ACEC – Canada 2018 Allen D. Williams Scholarship, and the 2018 Association of Professional Engineers & Geoscientists of Saskatchewan–Promising Young Member Award.

and foster a group of experts that we can call on when we need different thoughts, opinions, or views. And getting into the concept of first, second and third connections, we all have a very large, talented pool of experts that we could connect with easily to discuss a difficulty that needed to be recovered from. In a sense, *we can use the concept of consulting within consulting, to better advance the industry.* Now I admit, this is nothing new, but the technology and tools that are currently available and will soon become available will make this ever more possible and more efficient. Just think back to your own personal level of connectivity in 2004 when the YPF was launched (I'll help you out here and remind you that the first iPhone launched three years later in 2007, and the 2004 FIDIC conference was in Copenhagen). Before the time that we all carry a device with you where you could constantly look up facts (like the date the iPhone was launched) we depended on slower communication, and fact checking. This fact checking and integrity is a central part to the benefit of networking, due to the fact that the consulting engineering industry requires talented interpretation of multiple values, which can't be simply Googled and would be impossible to be commoditized due to the nature of the work and the social interactions. While a software program can run multiple iterations of a design, the systems still haven't become "smart" enough to include all of the factors required, and to sift through the large quantity of data to determine what is important and what is not.

Thus, since we are able to purchase devices, sensors, software and systems that allow us access to ever increasing data and efficient communications, our own personal networks must keep up to avoid our individual skills, industry and careers being left behind.

Which brings me to what I believe to be the best benefit to physically attending the FIDIC conferences, and any conference for that matter. At these events, we are exposed to new thoughts and approaches, but more importantly, we are exposed to the individuals that carry and produce those thoughts. We don't watch them through a screen, or read the words they have published, we get to hear them speak, see their body language, and perhaps even connect with them personally at one of the coffee breaks or evening events.

So, if you are reading this while in Berlin, CONGRATULATIONS, you have taken a great step towards increasing your professional resiliency just by attending. Now all you must do is get out there, meet the other attendees, and discuss the topics that you find in the program and being presented and discussed. If you are reading this after the event, there are many other conferences and events that you can attend to help your own professional resiliency through networking and knowledge sharing. To see how connected we really are, try using LinkedIn of another similar network tool to search for first, second and third level connections in a city on the other side of the world that you have never been to. For me, I found I have zero first level, one hundred and nine second level, and over ***two million*** people when searching for first to third level connections located in Beijing… which would be a great start if I ever wanted to do work in Beijing!

I am honored to be moderating the 2018 YP Symposium, and I hope that we all can benefit from the presentations and thoughts that we will share over the coming days. I invite you to connect with myself and all the other attendees in whatever way you feel most comfortable, as we will all benefit greatly from this valuable networking experience.

The Smart City Perspective as Viewed Through the Lens of a Young Fellow Living in a Not-So-Smart Neighborhood

By: Charles Frank –Tanzania

Note about author:

Charles Frank is a young Civil Engineer based in Dar Es Salaam, Tanzania and a member of FIDIC YPFSC. He is working full time with CPI International Limited, one of the established professional service organizations delivering world-class construction project management and engineering consulting services including design and supervision of structural and civil works.

Charles holds BSc (Hons) in Civil and Structural Engineering from the University of Dar es Salaam. He is passionate on all facets of Development and Sustainability issues and he is currently focused on revamping the Young Professionals Forum Chapter in Tanzania working closely with the Association of Consulting Engineers in Tanzania (ACET) secretariat.

In short, Charles is a relentless and tenacious individual who wouldn't succumb to pain and would often tread the road less travelled, particularly by committing his actions and motives in the path of integrity. His faith is deeply rooted into the most high God, the Maker of heavens and earth. He is blessed with a big and loving heart, and will always give the best to others, a good friend, although not entirely flawless.

I bet this is the longest title for an article you have come across heretofore. And you might begin to question the *smartness* of the author in the choice of his words, or the level of insights you hope to receive from a '*not-so-smart*' neighbourhood. Well, I cannot hold it anymore; please allow me to confess publicly that I had been battling with the decision of using the words *"Not-So-Smart"* in this headline. I am one of those *positive thinkers* who rarely use negative words, and when that happens, just know it is an abomination to our creed and I must have been at a gunpoint during the time of compiling this piece. So believe you me; the resolution to proceed with this title was a life-or-death plight.

I know that sounds strange, and that is EXACTLY how the people in a 'not-so-smart neighbourhood' feel when they hear the words "Smart City". Nevertheless, unlike them I chose to defy the odds and to embrace this '*too good to be true*' idea - so I attempted to acquaint myself with the "**smart city knowledge**" as the saying goes: *Nothing is yours until you understand it*.

Honestly speaking I do not have a PHD specialization in this area, but trust me I know just enough to push through the next few paragraphs as we delve into the crux of this matter.

According to a research from **IHS Technology** (*the world's leading source for research, analysis, and strategic guidance in the technology, media, and* telecommunications *industries*), there will be at least 88 smart cities all over the world by 2025.

A quick glance at my watch tells me that 2025 is but a breath away. This means that the promise of smart and frictionless cities is already more of a reality than a mere vision. And I begin to feel a chill in my bones as I wonder if at all - I *(and the* people *in a not-so-smart neighbourhood),* possess what it takes (that is the ***right skills*** and ***tools***) to become more proactive, connected, collaborative, and participative in this smart city movement. This boils down to a well-known adage that is, ***"the city is as smart as the people living in it."***

Talking about **smart people**, which is the backbone of any smart city movement. I solemnly believe that it requires a handful of dedicated smart fellas (such as I) living in the midst of a not-so-smart neighbourhood to bring forth **smart city acculturation** until this alien trait diffuse in on a large scale and substantially replace traditional cultural patterns of a not-so-smart neighbourhood.

As simple as that may sound, developing a smart city is not that entirely easy. In acknowledgement to volumes of initiatives that have moved forward in the wake of technological advancements, there is still some work to be done which may demand **collective efforts** from both businesses, citizens and governments.

As I grappled my way forward in pursuit of being part of the global community, little did I know that destiny would land me in the midst of a vibrant network of *FIDIC Young Professionals Forum Steering Committee (YPFSC)*; it is in this network that I obtained awareness on Urban Sustainability Management and the concept of Smart Cities and Mobility. Just by virtue of being part of this network my perspective have widened and as a sign of my appreciations; I am currently writing an article titled: ***"FIDIC YPF: A People That Make Me Think"***

So, in case you are still wondering what exactly is the perspective of this young fellow in regard to smart cities - here it is: The smart city transformation is here to stay as Internet of Things (IoT) gains improved shapes every day. And while no one knows precisely how we will manouvre in the near future, one thing is clear: the cities will become smarter and mobility frictionless, so I might as well prepare myself and influence my neighbours to adopt to this new normal.

References:

Deloitte insights at https://www2.deloitte.com/insights/us/en.html

IHS Technology at https://technology.ihs.com/