Improving trends in Construction Risk Management – where next?

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New risks in construction risk management

1. Risk management and the current status
2. Overview of the new trends in the Construction industry and Risk Management
3. Insurance applicability : Smart Risk management
4. Recommendations for a new RM code of practice
5. Q&A
What is Risk management

- Risk management is the identification, evaluation and prioritisation of risks followed by coordinated and economical application of resources to minimize, monitor and control the probability or impact of unfortunate events or to maximise the realisation of opportunities.

- In construction, the process involves planning, monitoring, and controlling instances of risk. The central part of a risk management plan is a document that details the risks and processes for addressing them.

1. Identify and assess the Risks
2. Determine Risk Response Strategy
   - Avoid the risk
   - Transfer the risk
   - Mitigate the risk
   - Accept the risk
3. Execute a risk management plan
4. Monitor the risks and enhance risk management plan
Risk management: a topic often discussed within our community

- IMIA WGP 083 (13) How can Engineering Insurers help reduce Loss
- IMIA WGP 028 (03) Risk Management Approaches in CAR/EAR Projects
- LEG Survey protocol study group report
- German Insurance Association: Off-shore Code of Practice
- ITIG - International tunneling insurance group and IMIA: Tunnel Code of Practice
- BS ISO 31000:2018 Risk Management Guidelines
- Guidance for design risk management – Institution of Civil Engineers March 2020
- Risk Engineering for major construction projects – IMIA 44th Annual Conference Amsterdam 2011 – Richard Radevsky
Acknowledgement to the limitations of the current model

- Engagement with the Project: One of the main issues is to have the project management on board and to acknowledge the risk of catastrophic events.
- Risk engineers selection: qualification, language and communication.
- Engineering fees: what about small value projects.
- Quality controls, defects, faulty workmanship, offsite prefabrication.
2. Overview of the New Trends in the Construction Industry and Risk Management
Construction matters for the world economy

... but has a long record of poor productivity

Construction-related spending accounts for

13% of the world’s GDP

...but the sector’s annual productivity growth has only increased

1% over the past 20 years

$1.6 trillion of additional value added could be created through higher productivity, meeting half the world’s infrastructure need

Global productivity growth trends(1)

Real gross value added per hour worked by persons engaged, 2005 $

Index: 100 = 1995

Compound annual growth rate, 1995–2014 (%)

- Construction
- Total economy
- Manufacturing

Hourly rate

1995
2000
2005
2010
2014

$25
$37
$39

1. Based on a sample of 41 countries that generate 96% of global GDP.

Source: OECD; WIOD; GGCD-10, World Bank; BEA; BLS; national statistical agencies of Turkey, Malaysia, and Singapore; Rosstat; McKinsey Global Institute analysis
In the USA productivity in construction has declined since 1968.

Many sectors have transformed and achieved quantum leaps in productivity; construction has changed little, limiting productivity gains.

Key advances, 1947–2010

**Agriculture**
Leveraged scale through land assembly and automation; deployed advanced bioengineering to increase yields

**Manufacturing**
Implemented entirely new concepts of flow, modularised and standardised designs, and aggressively automated to increase production

**Retail**
Utilised scale advantages and cutting-edge logistics to provide affordable goods to the masses

**Construction**
Limited improvements in technological capabilities, production methods, and scale

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**Gross value added per hour worked, constant prices**

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Manufacturing</th>
<th>Wholesale and retail</th>
<th>Mining</th>
<th>Construction</th>
<th>Overall economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>1960</td>
<td>161%</td>
<td>186%</td>
<td>180%</td>
<td>142%</td>
<td>111%</td>
<td>133%</td>
</tr>
<tr>
<td>2010</td>
<td>161%</td>
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</tr>
</tbody>
</table>

**Compound annual growth rate, 1947-2010**

- Agriculture: 4.5%
- Manufacturing: 3.5%
- Wholesale and retail: 3.4%
- Mining: 0.5%
- Construction: 0.1%
- Overall economy: 1.9%

**Total change**

- Agriculture: 16.1x
- Manufacturing: 8.6x
- Wholesale and retail: 8.0x
- Mining: 1.4x
- Construction: 1.1x
➢ The Construction industry must evolve and gain productivity and efficiency.

➢ This means new ecosystem, processes, tools, systems and they require a new approach in risk management
Seven ways to improve productivity in construction

McKinsey MGI report

- Reshape regulation and raise transparency
- Rewire the contractual framework
- Rethink design and engineering processes
- Improve procurement and supply-chain management
- Improve on-site execution
- Infuse digital technology, new materials, and advanced automation
- Reskill the workforce
The future construction ecosystem will be radically different

Today’s construction ecosystem: A highly complex, fragmented, and project-based construction process . . .
The construction ecosystem of the future:

A more standardized, consolidated, and integrated construction process
Modular and 3D construction

• Future?

• Now

• Past
Building Smarter: everyone wants a part of the cake!

Venture Capital Investment In U.S. Construction & Building Technology Startups, Through H1 2019

Where AI can be used?

In Project Management

- Machine learning-based project management
- Machine learning enables predictive analytics and can provide advice to the project manager
- AI-based project scheduling could include lessons learned from previous projects and suggest multiple possible schedules based on the context and dependencies
- Predictive project analytics will be the most disruptive innovation in project management in the next ten years. It will give project managers increased visibility into what the future may hold for a project, and will create value by enhancing the quality of decision making
- AI will assist, not replace, project managers
A bunch of new tools and devices…
Insurance applicability of new technologies

- Fire Prevention & Fire Safety
- Water Flow Management Devices
- Tunnel Safety & Third party exposure
- Risk Surveying, Progress Overviews
However new challenges arise

- Can the use of new risk management techniques/devices be built into policy wordings?

- Do new risk management techniques introduce new vulnerabilities? (for example, hacking risk, unfamiliarity of users who might introduce mistakes, taking away traditional tried-and-tested techniques)

- Will new risk management methods mean less people and more technology? People can often identify problems of a variety of types, technology tends to be focussed on one specific thing.

- Will new defects/technology be susceptible to failures/defects? Defects introduced by a robot or automaton might be repeated a very large number of times before being detected.
Our recommendations

- Construction industry is now evolving quickly and Insurance should partner with the industry
- A risk management plan should always be a bespoke solution not off-the-shelf.
- This includes a tailor-made program and best qualified engineers for the mission
- Engineering fees must not be a deal breaker because much is at stake if no plan is implemented
Our recommendations

- New tools, processes, technologies…mean new opportunities but also new challenges

- Faulty *workmanship* can become faulty *machineship*

- At which level *design defect* is to be considered

- Do we need specific new Exclusions and sub-limits in wordings for 3D-printed construction or Robotics/Autonomous sites?

- What about off-site(s) product serial defects: can we talk about a new “accumulation” type of exposure and product liability? Quality Control has a greater importance.

- Cyber exposure can become very different for a construction project than what it today

  New working groups? 3D printing/modular construction?
Our recommendations

- Brokers’ involvement from the very beginning is essential to the success of any risk management plan and moreover with the usage of new process to help bring the Client onboard

- Risk engineers need to understand new technologies and be up to date with usage and consequences of new devices

- Finally, in a world where mobility is constrained, new processes and remote surveying are a great opportunity for us Insurers to demonstrate our capability of adapting to a changing world while offering continuously best services.
Any questions