Social Media 社交媒體
A New Platform for Construction Practitioners to Share Construction Safety Knowledge
分享施工安全知識的新平台

Department of Real Estate and Construction
The University of Hong Kong
June 2016
What We Want to Know?

• Do construction workers and safety practitioners actively share accident prevention knowledge via social media?

• Do community identity, knowledge sharing self-efficacy, social awareness and altruism have positive effect on the intention of knowledge sharing and online knowledge sharing behavior?

• Does overconfidence of construction workers and safety practitioners have negative effect on the intention of knowledge sharing and online knowledge sharing behavior?
What Are Our Objectives?

• To enhance the awareness of using social media for safety knowledge building and information management among construction stakeholders.

• To generate new insights and obtain feedback among various construction stakeholders concerning how to better tap the online communications to make a change on construction safety.

What Have We Done?

• One large-scale questionnaire survey involving 21 local construction companies (Questionnaire survey 1).

• One small-scale questionnaire survey from attendees of a construction safety seminar (Questionnaire survey 2).
Construction Safety

• Numerous efforts to enhance construction safety performance - trainings, accident prevention equipment, safety culture and technologies....

• The construction industry still records the highest number of accidents and fatalities among all industries.

• In 2014 - 3,467 construction accidents and fatal cases, nearly 30% of the total industrial accidents (11,677 cases).

• Construction fatalities accounted for 80% (20 out of 25 cases) in Hong Kong (Hong Kong Labour Department, 2014).
Construction Safety

• Pressing problems among construction crew:
  ➢ Low quality of information capture
  ➢ Inconsistent information dissemination
  ➢ Inadequate reusable knowledge for collaboration
  ➢ Ineffective safety education and training
Construction Safety + Social Media

• Information and communications technology (ICT) – a new prospect for construction safety knowledge sharing.

• Exchange accident prevention information and report accident updates using mobile devices via social media.
Construction Safety – Knowledge Sharing

• Organizations normally conduct face-to-face safety training and site briefing to disseminate two types of knowledge.
  ➢ Explicit knowledge, e.g. manuals, work procedures, guidelines, provided in classroom training.
  ➢ Tacit knowledge, e.g. know-how, skills, techniques and experience through mentorship and sharing.

• **Knowledge gap** exists between individuals due to different attributes and experiences.

• Social Cognitive Theory (Bandura, 1991) argues that, individuals can self learn to fill the individual knowledge gap by having their goals set and regulate their knowledge compared with other similar experience.
Knowledge Sharing @ Social Media

Social media provides a virtual community to share and exchange tacit knowledge from each other.

**Short term:**
- Better suit individual learning needs.
- Lower training costs.
- Better obtain multi-level safety knowledge.

**Long term:**
- Higher level of individual safety knowledge through self-regulated process from social interaction.
- Higher safety awareness in online communities.
- Lower accident and fatality rate due to higher efficacy of knowledge sharing.
- More exposure to live experience and tacit knowledge.
Major Findings of Questionnaire Survey 1
Questionnaire Survey 1

• Questionnaire features
  ➢ Respondents’ background information
  ➢ 54 seven-point scale questions on 7 measurement items
  ➢ Exploratory questions on using social media for accident prevention knowledge sharing

• Results
  ➢ 21 construction companies participated
  ➢ 816 questionnaires received
  ➢ 741 questionnaires analyzed
Questionnaire Survey 1

- Demographic distribution

- Dominating gender: Male
- Dominating age groups: 20 - 30
Questionnaire Survey 1

**Years of work experience**
- <5yrs: 35%
- 5-10yrs: 19%
- 11-15yrs: 10%
- 16-20yrs: 14%
- 21-30yrs: 15%
- 31-40yrs: 6%
- 41-50yrs: 1%

**Number of participants in surveyed companies**
- <100: 63%
- 100-199: 12%
- 200-499: 13%
- 500-999: 5%
- 1000-2999: 7%
- 3000-4999: 0%
- >5000: 0%

Number of participants in surveyed companies
Questionnaire Survey 1

- Job nature

- Construction workers: 56%
- HSE supervisor: 15%
- E&M engineer: 2%
- Project manager: 4%
- Safety officer: 11%
- Surveyor: 7%
- Others: 4%
- Admin: 1%
**Questionnaire Survey 1**

### Internet experience
- 0yr: 12%
- 1yr: 11%
- 2-3yrs: 19%
- 4-5yrs: 21%
- 6-10yrs: 38%
- 11-20yrs: 37%
- 21-30yrs: 9%

### Experience of using social media
- 0yr: 12%
- 1yr: 19%
- 2-3yrs: 9%
- 4-5yrs: 21%
- 6-10yrs: 38%
- 11-20yrs: 9%
- 21-30yrs: 1%
Questionnaire Survey 1

• Distribution of frequently-used social media

<table>
<thead>
<tr>
<th>Job nature</th>
<th>Number</th>
<th>Facebook</th>
<th>Twitter</th>
<th>WhatsApp</th>
<th>Wechat</th>
<th>Weibo</th>
<th>Uwants</th>
<th>Discuss HK</th>
<th>Blog</th>
<th>HK Golden</th>
<th>Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Construction worker</td>
<td></td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185</td>
<td>20</td>
<td>267</td>
<td>182</td>
<td>35</td>
<td>44</td>
<td>57</td>
<td>23</td>
<td>43</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>E &amp; M Engineer</td>
<td></td>
<td>9</td>
<td>2</td>
<td>11</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Environmental</td>
<td>103</td>
<td>16</td>
<td>106</td>
<td>50</td>
<td>9</td>
<td>47</td>
<td>47</td>
<td>20</td>
<td>45</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Health &amp; Hygiene</td>
<td></td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Supervisor</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>24</td>
<td>1</td>
<td>27</td>
<td>15</td>
<td>4</td>
<td>6</td>
<td>12</td>
<td>2</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>24</td>
<td>12</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td></td>
<td>3</td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Projects Management</td>
<td></td>
<td>72</td>
<td>11</td>
<td>80</td>
<td>31</td>
<td>9</td>
<td>29</td>
<td>40</td>
<td>11</td>
<td>26</td>
<td>37</td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td>41</td>
<td>10</td>
<td>45</td>
<td>22</td>
<td>5</td>
<td>15</td>
<td>19</td>
<td>7</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Surveying</td>
<td></td>
<td>464</td>
<td>61</td>
<td>572</td>
<td>323</td>
<td>69</td>
<td>152</td>
<td>191</td>
<td>66</td>
<td>147</td>
<td>205</td>
</tr>
<tr>
<td>Total Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Questionnaire Survey 1

• Participants involved in accident prevention discussions via social media

**Job nature**

- Construction workers: 52%
- Engineer: 15%
- E&M engineer: 2%
- HSE supervisor: 0%
- Project manager: 5%
- Safety officer: 20%
- Surveyor: 4%
- Others: 2%
Major Findings of Questionnaire Survey 2
Questionnaire Survey 2

- Distribution of the regular ways to obtain safety/accident prevention knowledge and information

- Off-site training: 25%
- On-site training: 26%
- Training materials provided by the employer: 20%
- Social media: 23%
- Others: 6%
Questionnaire Survey 2

• Approval rate (“very important” or ‘fairly important’) regarding the reasons of using online social media to share safety/accident prevention knowledge?
  ➢ Efficiency – 94.4%
  ➢ Convenience – 97.2%
  ➢ Accountability/responsibility – 83.3%
  ➢ Community identity – 88.9%

• Do you think the use of online social media to share safety/accident prevention knowledge will increase?
  ➢ The efficiency of accident prevention?
    Yes – 86%
  ➢ The collaboration between co-workers?
    Yes – 89%
Questionnaire Survey 2

• Suggestions regarding the use of online social media to share safety/accident prevention knowledge:
  ➢ SMS should be sent to registered construction workers.
  ➢ Should ensure the accuracy of accident information.
  ➢ Should not disclose any unreliable information without verification.
  ➢ Passive, not enough interaction.
  ➢ Efficiency depends on notification on/off line.
  ➢ Free software/services should be offered by the client.
Conclusions

• Online social media has become a regular way to obtain safety/accident prevention knowledge and information in parallel to other traditional ways.

• Most survey participants thought the use of online social media to share safety/accident prevention knowledge will increase the efficiency of accident prevention and the collaboration between co-workers.

• Community identity has positive influence on knowledge sharing self-efficacy and social awareness.

• Altruistic element should be promoted in safety education.
Conclusions

• Social awareness does not have positive influence on knowledge sharing.

• Urgency of problem solving leads to seeking knowledge from real community members instead of virtual ones.

• Knowledge sharing self-efficacy is significant in predicting knowledge sharing behaviors.

• Breaking through the level of knowledge sharing self-efficacy is needed.

• Most construction practitioners are not overconfident in their exposure to accidents, hazards and injuries.
This has now become the trend....
The benefits are recognized....

There is still much room for improvement from many sides....
Acknowledgement

Supported by
The University of Hong Kong
Knowledge Exchange (KE) Impact Project
“The Use of Mobile Devices in Enhancing Safety Knowledge
Building and Information Management in the Construction Industry”

Team Members:
Dr. F.F. Ng, Dr. S.W. Poon, Dr. Y. Deng & Ms. Vienne Sung