

TOYOTA WAY LEAN LEADERSHIP: SOME PRELIMINARY FINDINGS FROM THE CHINESE CONSTRUCTION INDUSTRY

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ABSTRACT

Lean, which has its roots in the Toyota Production System (TPS), became a “buzz” word since early 1990s. To capture its true meaning, substantial attempts are made. Of these, Liker’s work on the Toyota Way is viewed as the most comprehensive and propounding. One of the principles associates with the Toyota Way is the Toyota Way style leadership, which has a big role to play in the lean transformation. This paper reviews the works of lean leadership, with a focus on the “Toyota Way style”. A list of attributes that pertain to Toyota Way lean leadership was developed, aimed at measuring the Maturity of Lean Leadership. This paper then made a qualitative inquiry with respect to the leadership characteristics of Chinese building professionals. As part of a larger research project, this study then made a comparison to the Toyota Way lean leadership. It was found that some of the Chinese leadership characteristics parallel the Toyota Way lean leadership attributes, but a few are presently not in place. Strategies are proposed for better implementation of the Toyota Way lean leadership in order for construction firms to have better opportunities to embark on the Lean journey.

KEYWORDS

Toyota Way, Lean leadership, China, Construction industry, Building professionals.

INTRODUCTION

The lean concept has gained popularity all over the world and across industries. However, in comparison to the benefits that Toyota has reaped from this approach, it is common to see many organizations fail to implement lean. One critical hurdle is the lacking of lean leadership. This paper aims to discuss what lean leadership is, using Toyota Way leadership as an example. From there, a number of lean leadership attributes are derived. This is followed by presenting findings derived from a larger research project that examined lean leadership among Chinese construction firms. Moreover, this study complements attempts made previously to investigate lean in the Chinese construction industry with a focus on its operational aspects (Gao and Low 2013; Low and Gao 2011).

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LITERATURE REVIEW

LEAN

The term *lean* was coined more than 25 years ago to refer to stripping out the wasteful aspects of processes and maximizing the value to customers. However, misunderstandings of lean still remain (Hines et al. 2004), and it is often mistakenly equated with a set of tools and techniques that can be readily applied to achieve efficiencies and standardized processes in the short term. When lean was brought into construction, such ambiguities in the definition of lean construction remained unclarified (Green and May 2005; Jørgensen and Emmitt 2009). It is commonly acknowledged that such implementing lean tools represent only a small part of the effort required in lean transformations (Mann 2009). The other, often overlooked, efforts are related to leaders' practices and behaviour. The role of leadership might sometimes seem extravagant or excessive, but there is no question that leadership plays a major role in lean transformation. Ethington (2014) comments that the two things we must do as lean leaders are: (1) get the work done; and (2) at the same time, develop people as problem solvers. These requirements actually show that a lean leader is not merely a problem fixer, but is also a good teacher. According to Mann (2009), the missing link is the set of leadership behaviours and structures that make up a lean management system. Similarly, a closer examination of Liker's (2004) Toyota Way model (which will be briefly discussed in the following section) shows the importance of "people" in lean transformation. The Toyota Way model contains four layers: philosophy, process, people and partners, and problem solving. Given that the "People" layer is placed above the "Process" layer, it seems to be the case that the roles of leadership, employees, and partners are more important than the operational or tactical lean tools.

LEAN LEADERSHIP: THE TOYOTA WAY STYLE

Lean leadership is an integral part of the Toyota Way production system or Toyota Way (Orr 2005). In order to understand the concept of lean leadership, it is important to look at the Toyota Way leadership for reference.

Living in the Toyota Way culture

Throughout Toyota's history, key leaders have been found within the company, at the right time, to shape the next step in Toyota's development. Toyota does not go shopping for "successful" CEOs and presidents because their leaders must understand the Toyota culture and philosophy well. These include the former president Fujio Cho, who grew up in Toyota and was a student of Taiichi Ohno, where he and Ohno created the theoretical basis for the Toyota Production System, to the current president Akio Toyoda, who has also worked for Toyota for approximately four decades. These leaders lived and thoroughly understood the Toyota culture day by day (Liker 2004). For this reason, Toyota cannot readily recruit leaders; they must take people who have some natural leadership abilities and develop them to think and act in the Toyota Way every day—a process which easily can take decades or more to home (Liker and Hoseus 2008).

Thoughtful leaders and servant leadership

Toyota's internal document, *the Toyota Way 2001* cited in Liker and Hoseus (2008, p.139), defined thoughtful leaders as: "*Having the ability to energize and invigorate others, willingly giving realistic challenges and development opportunities and fostering a sense of accomplishment in subordinates. Thoughtful leaders monitor individual and team performance, holding people accountable for their actions and taking responsibility for their activities.*" Unlike the traditional manager's image as a monitor and controller under a command structure, Toyota leaders focus on confirming that all the works are followed by a set of defined rules of *takt* time, operations-standard work, 5-S, etc rather than catching people make mistakes and blame them. Management should have a shop-floor focus because they are taught that all value-added activities start on the shop floor and their job is to support the team members (Convis 2001). Moreover, thoughtful leaders do not assume that the right rewards and punishments will produce impact on the behaviours of their employees. Rather, thoughtful leaders develop a culture in which they can effectively delegate to and trust their team members to produce excellent results (Liker and Hoseus 2008). Servant leadership is the concept formalized by Mikio Kitano, TMMK¹'s second president (Liker and Hoseus 2008), who prioritized the team members at the top and put himself (and other leaders) at the bottom in an upside down pyramidal model. In this model, the group leader is the first level of "management", who leads a small group of approximately five to seven people. Both team leader and group leader has three basic responsibilities: (1) support the operations, (2) promotion of the system, and (3) leading change (Liker and Meier 2006). The key concept of servant leadership recognizes that the value-adding work is the process of building cars where team members can directly add value. Leaders only add value by supporting those who are most actively adding value to the process, and therefore, leaders are posted to the bottom of the pyramid. This is unlike in a traditional top-down organization, where the capacity and imagination is limited to a few leaders at the top.

The differences compared to the Western way

Table 1 summarizes some of the key differences of the Toyota Way leadership which is contrary to the practices of western managers. It reveals the distinctive leadership in Toyota from other companies. The Toyota leaders must have a combination of in-depth understanding of the work and the ability to develop, mentor and lead people. The expectation of leadership in Toyota is to effectively develop people so that performance is constantly improved. This is accomplished by instilling the Toyota culture in all employees, by continuously developing and growing capable people, and by focusing the efforts on strengthening the Toyota Production System (Liker and Meier 2006).

¹ TMMK refers to Toyota Motor Manufacturing, Kentucky in the United States of America.

Table 1: Traditional Western leadership compared to Toyota leadership

Traditional Western leadership	Toyota leadership
Quick results	Patient
Proud	Humble
Climb ladder rapidly	Learn deeply and horizontally and gradually work the way up the ladder
Results at all costs	The right process will lead to right results
Accomplish objectives through people	Develop people
Overcome barriers	Take time to deeply understand problem and root cause before acting
Manage by numbers and graphs	Deeply understand the process by go and see what happens in the first place (<i>genchi genbutsu</i>)

Source: Liker and Hoseus (2008)

In summary, the current leadership tenet of the Toyota Way can be summarized as:

- (1) Support the culture: Toyota invests years to develop leaders who carry the DNA of the company in their thoughts, words and actions. In turn, the leaders should make efforts to support the culture in order to create the environment for a learning organization.
- (2) Support the people doing the work: The absolute core of the Toyota philosophy is that the culture must support the people doing the work (Liker 2004). This feature of Toyota leadership is sometimes described as “servant leadership”. The higher leaders go, the less direct power they have.
- (3) Toyota wants leaders who live the core values, including the spirit of challenge, *kaizen*, *genchi genbutsu*, respect, and teamwork.

LEAN LEADERSHIP IN CONSTRUCTION

Much has been written about lean in the past two decades. When attempts were made to adopt lean outside manufacturing—for example, in the construction industry—the focus generally fell on lean tools, rather than on the people-related components of lean. As Green (2002) argued, if the construction industry overwhelmingly focuses on waste elimination and improving efficiency, without explicitly considering the HRM implications, then construction companies and professional firms will find it increasingly difficult to attract intelligent, creative young professionals to join the industry. Similarly, Bettler and Lightner (2013) have argued that the lean construction community lacks a comprehensive model of lean leadership. Arguably, some of the lean leadership attributes have been discussed individually. For instance, Toyota (lean) leaders must have a combination of an in-depth understanding of the work and the ability to develop, mentor, and lead. In the construction context, project managers are required to develop two types of skills—namely, specific skills and general skills (Edum-Fotwe and McCaffer 2000). The former relate exclusively and directly to construction projects, and reflect the specific skills. The latter are essential for the project manager to function effectively with his or her specialist knowledge; they

include leading, communicating, negotiating, and problem-solving skills (Edum-Fotwe and McCaffer 2000).

Other than the essential skills required of Toyota (lean) leaders, Toyota's unique organizational structure is highlighted by Liker (2004), and reflects Toyota's philosophy of adding value to its employees. In construction, Orr (2005) compared the traditional stakeholder's organization with its lean version. Traditionally, the stakeholder's organization may be drawn as a pyramid as illustrated in Figure 1 (the left pyramid), with the director at the top, and the tradesperson at the base. The principle is that, in a traditional organization, directions are given from the top in a command-and-control manner. Inspired from the team leader concept in the lean (TPS) philosophy, another pyramid (this time inverted) was proposed by Orr (2005), as illustrated in Figure 1, where the tradesperson is at the top and is supported by the rest of the stakeholders.

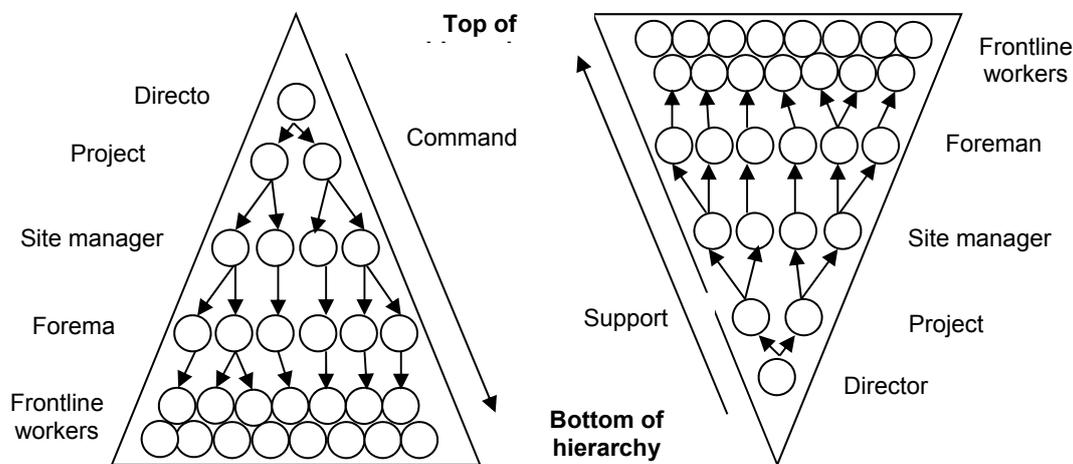


Figure 1: Organizational structures in the traditional and lean perspective

This mirrors the servant-leadership concept in the construction context. If the upside-down pyramidal organization structure can be successfully implemented in the construction industry, it will enable the leaders to use all efforts, as well as all necessary resources, to help the front-line workers. In construction, leadership is of prime importance, and is required to smooth and activate effective teamwork at the site level. For example, site managers are no longer simply inspectors to check the work after its completion. Instead, they must devote time to solving problems by going and seeing the source first-hand, and being responsible for achieving and maintaining productivity excellence.

THEORETICAL GROUNDS

Various terms have been used to describe leadership as well as different views of how one can become a leader or what characteristics a leader possesses. Toyota's unique leadership, also sometimes known as servant leadership, has been discussed earlier. It seems that Liker and Hoseus (2008) borrowed the term "servant leadership", which was first coined by Greenleaf (1977), to describe the Toyota leaders, by having a combination of in-depth understanding of the work and the ability to develop, mentor, and lead people, are respected for their technical knowledge as well (Liker 2004). In

contrast to leaders who utilize people as machines in the Taylorism period, servant leaders empower followers to “*grow healthier, wiser, freer, more autonomous, and more likely themselves to become servants*” (Greenleaf 1977, pp.13-14). Servant leadership theory prioritizes its focus on others rather than upon self and on understanding of the role of the leader as a servant (Greenleaf 1977). Russell and Stone (2002) established a practical model for servant leadership, which included 9 functional attributes namely vision, honesty, integrity, trust, service, modelling, pioneering, appreciation of others, and empowerment. An interpretation of the servant leadership attributes that are in agreement with Toyota’s leadership practice is presented in Table 2.

Table 2: Matching the functional attributes of servant leadership to Toyota’s leadership practice

Functional attributes of servant leadership (Russell and Stone 2002)	Toyota’s leadership practice (Liker 2004; Liker and Hoseus 2008)
Vision (Communication)	<ul style="list-style-type: none"> • Toyota leaders’ vision is to focus on a long-term purpose for Toyota as a value-added contributor to society
Honesty and integrity (Credibility)	<ul style="list-style-type: none"> • Humbleness is a good trait of Toyota leaders • Respect for the individuals is one of the five supporting values of the Toyota way
Trust (Competence)	<ul style="list-style-type: none"> • Toyota leaders take responsibility to do their best to build mutual trust, which is what makes it possible for individual employees to admit problems and take responsibility for solving them. • Toyota employees trust their leaders also because the leaders possess solid technical knowledge that can help them solve problems.
Empowerment (Teaching and delegation)	<ul style="list-style-type: none"> • Empowerment occurs when employees use the company’s lean tools to improve the company. However, Empowerment is not placed until individuals and teams really understand the Toyota Way and TPS.
Service (Stewardship)	<ul style="list-style-type: none"> • Toyota leaders constantly work on shop floor and provide timely assistance in answering the <i>andon</i> call. Basically, the most significant responsibility of Toyota leaders is to add more value to the employees.
Modelling (Visibility)	<ul style="list-style-type: none"> • Toyota leaders exhibited their dedication in quality by going to the <i>gemba</i> – the actual place where the real added-value work is done to modelling themselves to the employees.
Pioneering (Influence and persuasion)	<ul style="list-style-type: none"> • Toyota leaders are willing to meet challenge with courage and creativity. Leaders always challenge the employees to achieve improvement in a production area (e.g. double productivity; reduce the changeover time).
Appreciation of others (Listening and encouragement)	<ul style="list-style-type: none"> • Various motivation theories are practiced at Toyota.

Note: attributes in brackets are accompanying attributes of servant leadership model.

RESEARCH METHODS

This paper draws on surveys and interviews of building professionals in China to investigate three central issues: (1) the extent to which the Toyota Way styled leadership has been implemented within large Chinese construction firms, and (2) how some of the Toyota Way leadership attributes are established among Chinese building professionals. A questionnaire survey was adopted to collect data for the purpose of assessing the first objective. The design of the questionnaire on the Toyota Way leadership was underpinned by the works of Liker (2004). A five-point Likert scale was used, ranging from 1 (not at all) to 5 (to a large extent) for implementation, and 1 (not very important) to 5 (extremely important) for level of importance in the measurement of 7 attributes. The questionnaire survey was conducted from February 2011 to May 2011. Questionnaires were sent to a mailing list of firms through the author's contacts, which consisted of multiple sources, including the Chinese Construction Association. The list consists of more than 400 large Chinese construction firms. In total, 93 copies of the questionnaire were returned, representing a 24% response rate. Among the respondents, a large majority are highly experienced, with 75% and 33.3% having more than 10 years and 20 years work experience respectively. A majority of the respondents were managerial personnel, including 34 general (deputy) managers (36.6%), 23 project managers (24.7%), and 15 engineers (16.1%). The majority of the respondents hold senior management positions who able to provide reliable responses to the questionnaires. With respect to the respondents' firms, three-quarters of the responding firms were general contractors, and the remaining one-quarter were qualified to conduct business as professional contractors (subcontractors). There were 55 (57.4%) firms registered in the "Premier"¹ category of firms' qualification, which outnumbered the first grade (41.7%) firms. In terms of the ownership of firms, the sample comprised 62 stated-owned firms and 31 private firms. With respect to the second objectives, interviews and multiple site visits were carried out. Semi-structured (face-to-face) interviews were conducted with 10 management staff, all of whom were Chinese building professionals and were willing to be involved in the follow-up interviews. The interview was designed to explore in greater depth about how they would implement some of the Toyota Way leadership. The interviews actually follows a prepared interview guide, where the focus is to allow the interviewees to reflect on their leadership style against the Toyota Way style which has been briefly introduced prior to the interviews. Each interview normally lasts about 1 hour.

SURVEY RESULTS

Table 3 shows the mean values for attributes derived from the Toyota Way styled leadership. The overall mean value is 3.68. From Table 3, all the identified Toyota Way leadership attributes were scored less than 4 ("moderate" level) in terms of the implementation level. Moreover, it can be seen that the importance values were generally rated higher by the respondents.

¹ All the general contractors in China are classified as premier (highest level), first, second, or third grade, or below third grade.

A closer examination reveals that four attributes were placed at the very top ranks. L2 ($m = 3.87$) is in the first place, then L4 ($m = 3.85$) in second place, followed by L5 ($m = 3.76$) and L6 ($m = 3.71$), in the order of implementation. This shows that the leaders from the responding firms, possess “in-depth job knowledge” (L2) to a moderate extent, intend to “provide support to the employees while they are doing their work” (L4), intend to “take time to understand problems and root cause” (L5) and “encourage employees to develop a ‘kaizen’ mind-set in thinking and action” (L6). This is reflected in the fact that the Chinese building professionals who are in leadership positions do exhibit some of the good qualities and abilities that are in line with the Toyota Way-style leadership features. With respect to perceived importance, both L1 and L2, which concern leaders capability to “inspire people to achieve goals” and the extent to which leaders must “possess in-depth job knowledge” have been assigned the maximum points ($m = 4.31$), putting them in the first place on the importance scale Toyota Way leadership framework.

Table 3 Descriptive statistics of Toyota Way leadership attributes in terms of the implementation and perceived importance

Toyota Way leadership attributes	Implementation			Importance			P-value
	Mean	S.D.	Rank	Mean	S.D.	Rank	
<i>Toyota Way styled leadership</i>	3.68	.886	-	4.15	.805	-	
L1 Leaders are motivated to inspire people to achieve goals	3.49	1.02	6	4.31	.790	1	.000
L2 Leaders must have in-depth job knowledge	3.87	.806	1	4.31	.748	1	.000
L3 Leaders possess teaching ability and are able to pass their knowledge on to others	3.45	.887	7	3.95	.872	7	.000
L4 Leaders must support the employees doing their work	3.85	.789	2	4.13	.797	4	.001
L5 Leaders will take time to understand problems and root causes before acting	3.76	.826	3	4.15	.765	3	.000
L6 Leaders strongly encourage employees to develop “continuous improvement” in thinking and action	3.71	.980	4	4.11	.823	5	.000
L 7 Leaders must understand the company policy and procedures, and communicate these to their team	3.63	.892	5	4.06	.840	6	.000

Furthermore, according to Table 3, of all the attributes identified, attribute L3 “*possess teaching ability and pass knowledge on to others*” which is one key element of leadership, was given a relatively low rating in terms of implementation and perceived importance. One interpretation of this low rating is that passing in-depth knowledge to followers is not a strength of Chinese leaders, even though they are described as technically knowledgeable (L1). Together with L1, “*leaders are motivated to inspire people*”, which was also poorly rated, the inference seems to be

that Chinese construction professionals may not view themselves as strong in soft skills such as inspiration to lead, coaching, motivating employees, etc. Conversely, visible leadership characteristics such as providing support to employees (L4) and taking time to understand problems (L5) were more highly appreciated and practised than the less tangible behaviours just mentioned. Slattery and Sumner (2011) explained that this could be due to the dynamics of managing projects within the construction industry, in which managers take responsibility to lead the team to achieve tangible results.

INTERVIEW FINDINGS

This section presents an analysis of how the Toyota Way style leadership might be adopted in China's construction industry

Long-term employment

Of the 10 building professionals interviewed, a majority stated that they had been working for their respective firms since they started their careers. Two vice presidents shared a very similar career path in that both were "home-grown leaders". They started their first job as a foreman on site, and were gradually promoted to be engineer-in-charge, then project manager, and eventually were placed into a managerial position in the head office and recently promoted as the vice president. They understood the firm's value and culture thoroughly. In addition to direct day-to-day affairs, formulate and implement strategies, manage work related problems, and others, their current responsibilities also include laying the groundwork for the firm's culture, and giving formal and informal talks and speeches to employees at different levels.

Technical knowledge

Most interviewees agreed that the project manager was the key person who made the most significant contributions to project performance. Chinese building professionals, as described by the majority of interviewees, are very knowledgeable in terms of technical skills. This is largely derived from their working experience in various projects, which has profoundly shaped their technical know-how. On the project level, they were able to help engineers deliver technical analyses and to provide resolutions in crisis situations. One project manager explained that:

"Few problems are expected in my project, compared to others. This is because our leaders are able to anticipate the risks and contribute to overcoming the most significant constraints before these actually turn into real problems. This not only requires a skill set, but also a visionary mind, a dedicated heart, and a good relationship with clients and other parties."

Some other interviewees mentioned that, on many occasions, site engineers would approach them for solutions without having made the proper investigations in advance. Such firefighting activities contribute greatly to their extreme busyness on site.

Teaching ability: mentorship schemes

Several respondents recalled that they have experience as mentors for new recruits. They indicated that such mentorship programmes usually last for one or two years—a period equivalent to an entire project's life cycle. In most cases, once the mentorship has completed, an assessment evaluates the trainees' technical knowledge and the other skills they attained during the mentorship. It was then up to the firm to decide whether the mentor scheme should continue, or if it should be considered to have completed successfully. If the trainee's assessment results turn out to be excellent, the mentor is awarded a bonus for his or her efforts.

Servant leadership

The highest calling a project leader has is to guide, motivate, and support each person in the project to enable him or her to contribute to the project success (Tener 1993). To satisfy workers' needs and boost their morals, almost all the respondents pointed out that the "people-centric" philosophy was adopted as a guiding principle in the firm. However, unlike Toyota leaders who are often credited with supporting employees while they are doing the work, the interview findings suggest that leaders in China's context also place high importance on valuing people and in caring for them through various means. The examples given for people-centric activities were more focused on the well-being of the workers rather than in supporting their work at the workplace. For example, people-centric leadership surfaces in the way that the project team provided clean and comfortable accommodation (e.g. air-conditioned dormitories in summer for the workers), standard set of meals at site, entertaining performances, playground, and others. These can alleviate the pressure on the workers. The caring environment was observed by Chen and Partington's (2004) study, which showed that the Chinese project managers perceived the team members as family members and were willing to take care of, and to support each other.

DISCUSSION AND CONCLUSION

Overall, the results show that Toyota Way leadership is regarded by most of the survey respondents and interviewees as an essential factor in a firm's performance; it was thus implemented to a relatively high degree. Chinese construction firms about to embark on lean transformation may already have a number of strengths in this area, including the fact that the (project) leaders of large Chinese construction firms possess in-depth technical skills, understand materials and physical processes, and also possess problem-solving skills. However, these results seem to be inconsistent with the assertion of Lu et al. (2008), who identified a lack of general management skills as a common weakness at Chinese construction firms. Arguably, China's booming construction market has benefited a large number of project managers, by developing and enhancing their management skills, especially in technical aspects (Gao et al. 2012). Because of the experiences they have gained through various types of projects, they have now become valuable assets for companies and projects. Among those interviewed, some have worked for their firms for a very long time and thoroughly understand their company's culture, values, and mission. This appears to be very similar to what Liker (2004) described about the experience of Toyota's leaders. Moreover, Chinese building professionals in this study also showed their great willingness and commitment to support their employees in performing better.

This echoes Han et al.'s (2010) finding that putting people first is the most important leadership characteristic shown in China: assisting subordinates in problem-solving with their assigned duties. Chinese leaders' down-to-earth personalities and family-style leadership (Chen and Partington 2004), as well as their in-depth understanding of construction projects have allowed many project managers to become successful and capable leaders. However, apart from technical skills, it seems that the importance of some soft skills is undervalued. For example, there is a lack of teaching ability. Although the so-called mentor system is available at most of the Chinese construction firms interviewed for the purposes of this study, it is generally designed for new recruits and lasts for only a short time. This contrasts with Toyota's requirement of its leaders: not only should they be constantly on the shop floor to provide the guidance necessary for employees (Liker 2004), but the leaders also need to teach employees to perform their work better, in line with the idea of "learning by doing". It seems that Chinese building professionals are the on-site "firefighters", who always need to turn up to help resolve certain problems.

This study has investigated the extent to which lean leadership is practised among Chinese building professionals. It can assist Chinese building professionals in understanding their strengths and weaknesses in adoption lean leadership. However the caution should be noted that the number of interviewees is a limitation in this study. Although there were 10 interviewees participated, and was sufficient to conduct analysis, it is nonetheless a relatively small sample. The finding could be greatly improved if more opinions were sought and used.

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