Analysis of Risks of Adopting Integrated Project Delivery: Application of Bayesian Theory

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Abstract : Integrated project delivery (IPD) is a project delivery method distinguished by a shared risk/rewards mechanism and multiparty agreement. IPD has drawn increasing attention from construction industry due to its reliability to deliver high-performing buildings. However, unavailable IPD specific insurance concerns the industry participants who are interested in IPD implementation. Even though the risk management capability can be enhanced using shared risk mechanism, some risks may occur when the partners do not commit themselves into the integrated practices in a desired manner. This is because the intense collaboration and close integration can not only create added value but bring new opportunistic behaviors and disputes. The study is aimed to investigate the risks of implementing IPD using Bayesian theory. IPD risk taxonomy is presented to identify all potential risks of implementing IPD and a risk network map is developed to capture the interdependencies between IPD risks. The conditional relations between risk occurrences and the impacts of IPD risks on project performances are evaluated and simulated based on Bayesian theory. The probability of project outcomes is predicted by simulation. In addition, it is found that some risks caused by integration are most possible occurred risks. This study can help the IPD project participants identify critical risks of adopting IPD to improve project performances. In addition, it is helpful to develop IPD specific insurance when the pertinent risks can be identified.