應用計畫評核術在資源限制下的排程與風險評估架構

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摘 要

資源限制專案排程問題是專案管理的熱門研究議題，然而其中較符合實務狀況採隨機工期的研究卻相對稀少。此類研究受限於NP-hard problem的限制，多採啟發法(heuristics)進行求解，因此受限於啟發法本身的缺陷，且未針對不確定性造成的風險加以考量，結果也多僅以期望專案工期呈現，未能提供更多的排程資訊。因此本研究建立以情境為基礎(scenario-based)的專案排程與風險評估架構，嘗試改善上述問題。首先採用蒙地卡羅模擬法(Monte Carlo simulation)，模擬出在預定組數之不同作業工期，根據質性模擬圖型法(Qualitative Simulation Graph Methodology)建立在資源限制下各種可行排程(feasible schedule)，採事件圖形(event graph)來建立作業的邏輯關係將可行排程轉換為對應作業路徑(activity path，或稱之PERT-path)。階段二，根據EU-E(expected utility-entropy)決策模型對所有可行排程依據決策者客觀風險及主觀效用函數，計算出不同偏好組合所對應最佳路徑之客觀風險值及主觀效用值。本文最後以實例說明，此架構可建構依據決策目標發展的樹狀排程圖，並評估出專案風險值、最可能依循的完成路徑，以提供專案規劃者更多的資訊制定排程決策與控制計畫。

關鍵詞 : 專案排程 ; 資源限制 ; 隨機工期 ; 風險評估

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