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Identifying and constructing leading indicators for monitoring and controlling performance of engineering projects

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PMSs (Performance measurement systems)

PMSs classical models:
- Performance Measurement Matrix (1989);
- Performance Pyramid System (1991);
- Balanced Scorecard (1992, 1996);
- Integrated Performance Measurement System (1997);

Gap analysis:
1) Balanced scorecard has been used across the world, whereas many other frameworks have tended only to have regional appeal;
2) The practices in industries are not following the rapid academic rhythm.

Characteristics: Providing visibility into expected project performance and potential future states; Providing predicative analysis based on trend information or significant correlation.

18 SE Leading indicators

Requirements Trends Risk treatment trends
System Definition Change Backlog Trend Systems engineering staffing and skills trends
Interface Trends Process compliance trends
Requirements Validation Trends Technical Measurement Trends
Requirements Verification Trends Facility and equipment availability trends
Work Product Approval Trends Defect/ error trends
Review Action Closure Trends System affordability trends
Technology Maturity Trends Architecture trends
Risk Exposure Trends Schedule and cost pressure

SEM (Systems engineering measurement)

Characteristics:
- Compatibility
- Gap size
- Gap time
- Gap quality

18 SE Leading indicators vs. 10 Knowledge areas (PMBoK)

Requirements trends
- System definition change backlog trend
- Interface trends
- Requirements validation trends
- Requirements verification trends
- Work product approval trends
- Review action closure trends
- Technology maturity trends
- Risk exposure trends
- Risk treatment trends
- Systems engineering staffing & skills trends
- Process compliance trends
- Technical measurement trends
- Facility and equipment availability trends
- Defect/ error trends
- System affordability trends
- Architecture trends
- Schedule and cost pressure

Preliminary mapping result after reading through it can be concluded that it's feasible to apply some measurement methods in Systems Engineering like SE leading indicators in the general project management.