Matrices-Based Business Process Fragments Merge

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General Context & Motivations
• New processes design from scratch is time consuming and error prone
• Needs implementation, compilation, and optimization
• Redundant operations in existing business processes are already implemented, compiled, and optimized operations
• Retrieve and reuse relevant fragments from business processes
• Reduce development time and enhance robustness

Objectives
1. Provide consolidated fragment that is the merge of a set of relevant fragments
2. Keep the behavior of input fragments

Fragment Adjacency Matrix (FAM)
• A graph can be modeled with an adjacency matrix
• Illustrate the existence of edges between adjacent nodes
• Nodes = activities, Adjacent nodes = adjacent activities
• Elements = paths between adjacent activities

FAM Correctness Properties
1. An element containing a path of size 1 cannot contain other paths, and the rest of the elements of the row and the column are empty.
2. Several elements of a row are not empty if the first control flow of each element paths is shared by all of them.
3. Several elements of a column are not empty if the last control flow of each element paths should be shared by all of them.

Matrix M Obtained from the Merge of Two Fragment Matrices
1. Elements of a row (resp. a column) whose paths do not share the first (resp. the last) control flow insert a divergence (resp. convergence) gateway between objects of the first (resp. last) control flow of each path.
2. An element may contain several paths retrieved from several fragment matrices and do not share the first nor the last control flow insert a divergence and a convergence gateway between objects of the first and the last control flow of each path.

Results of the Merge Execution with Time Focus

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