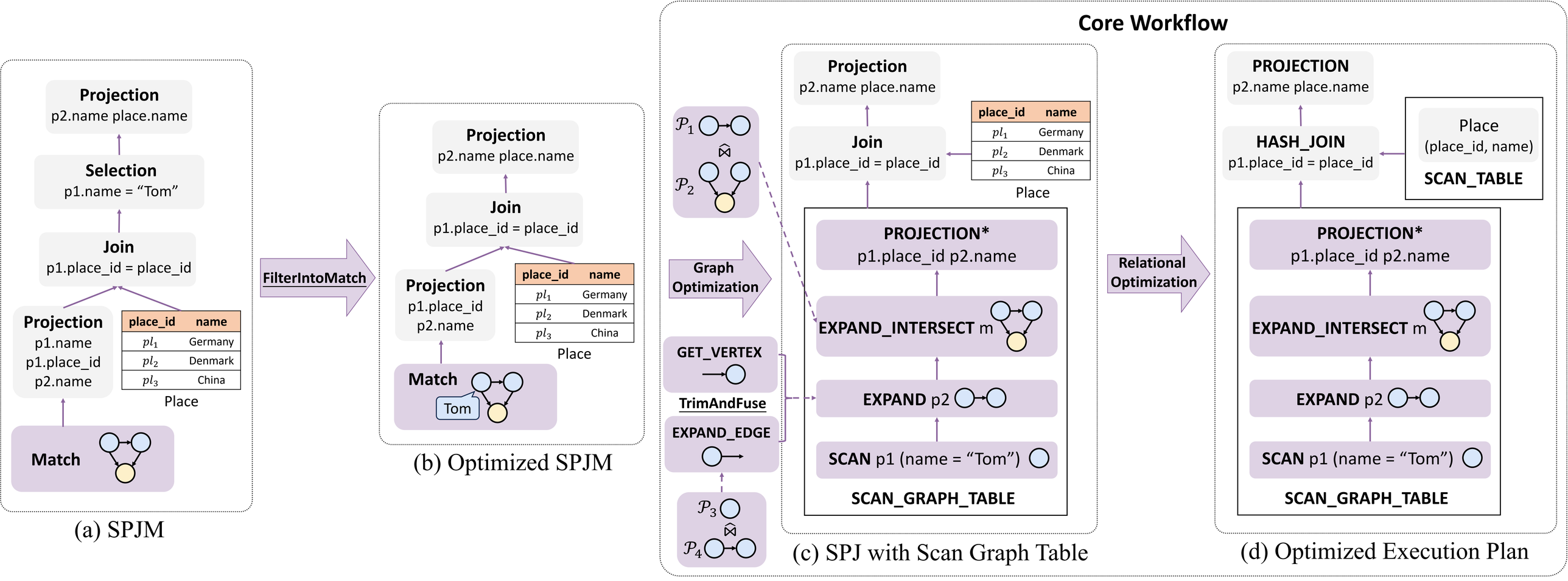
Projection
p2.name place.name
Selection
p1.name = “Tom”
Join
p1.place_id = place_id
Projection
p1.name
p1.place_id
p2.name
place_id
name
pl_1 Germany
pl_2 Denmark
pl_3 China
Place
Match
(a) SPJM
FilterIntoMatch
Projection
p2.name place.name
Join
p1.place_id = place_id
Projection
p1.place_id
p2.name
place_id
name
pl_1 Germany
pl_2 Denmark
pl_3 China
Place
Match
Tom
(b) Optimized SPJM
Core Workflow
$\mathcal{P}_1$
$\mathcal{P}_2$
Graph Optimization
GET_VERTEX
TrimAndFuse
EXPAND_EDGE
$\mathcal{P}_3$
$\mathcal{P}_4$
Projection
p2.name place.name
Join
p1.place_id = place_id
place_id
name
pl_1 Germany
pl_2 Denmark
pl_3 China
Place
PROJECTION*
p1.place_id p2.name
EXPAND_INTERSECT m
EXPAND p2
SCAN p1 (name = “Tom”)
SCAN_GRAPH_TABLE
(c) SPJ with Scan Graph Table
Relational Optimization
PROJECTION
p2.name place.name
HASH_JOIN
p1.place_id = place_id
Place
(place_id, name)
SCAN_TABLE
PROJECTION*
p1.place_id p2.name
EXPAND_INTERSECT m
EXPAND p2
SCAN p1 (name = “Tom”)
SCAN_GRAPH_TABLE
(d) Optimized Execution Plan