Data Science for an Optimal Global Supply Chain – the 5G Smart Phone Case

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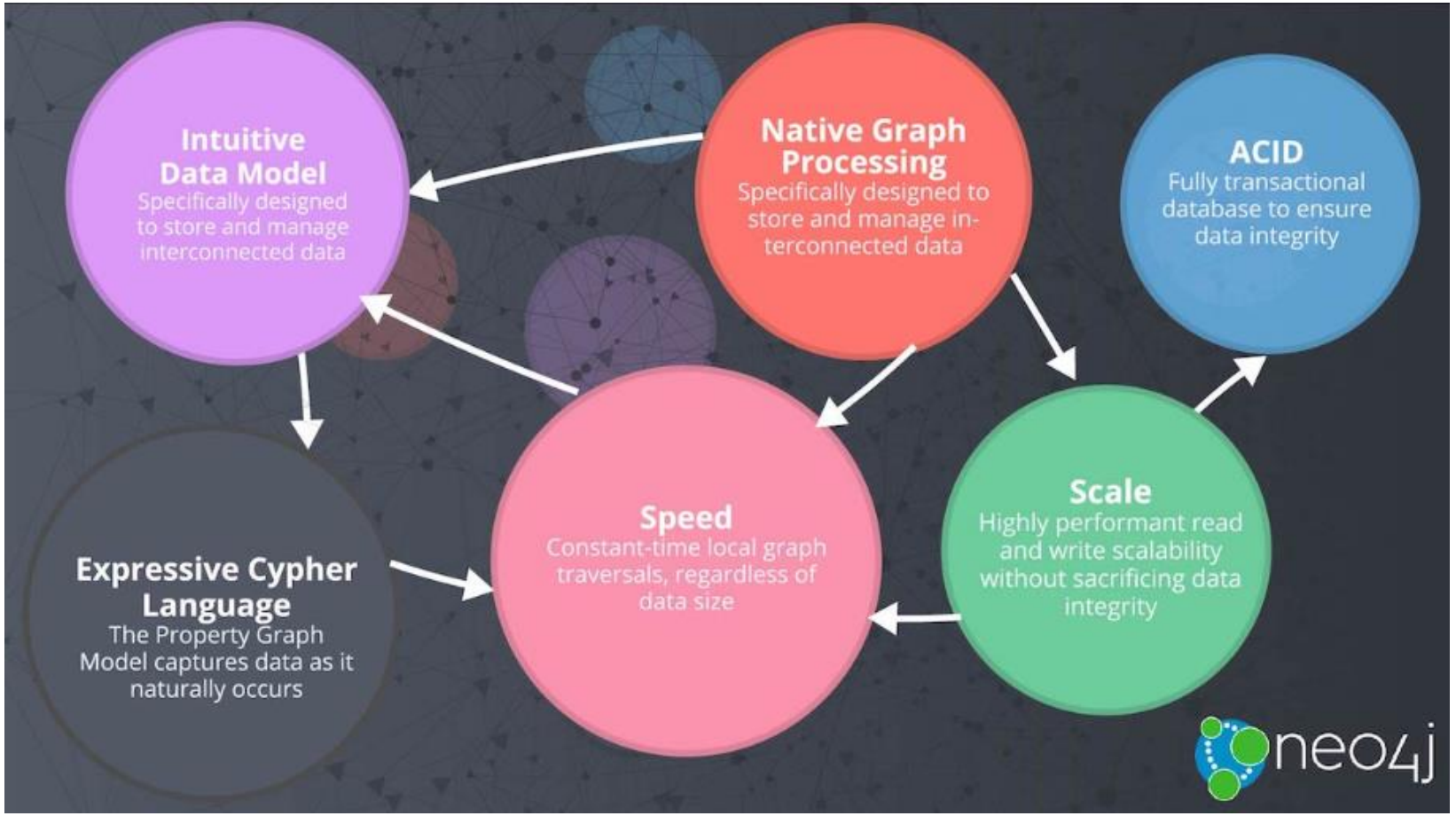
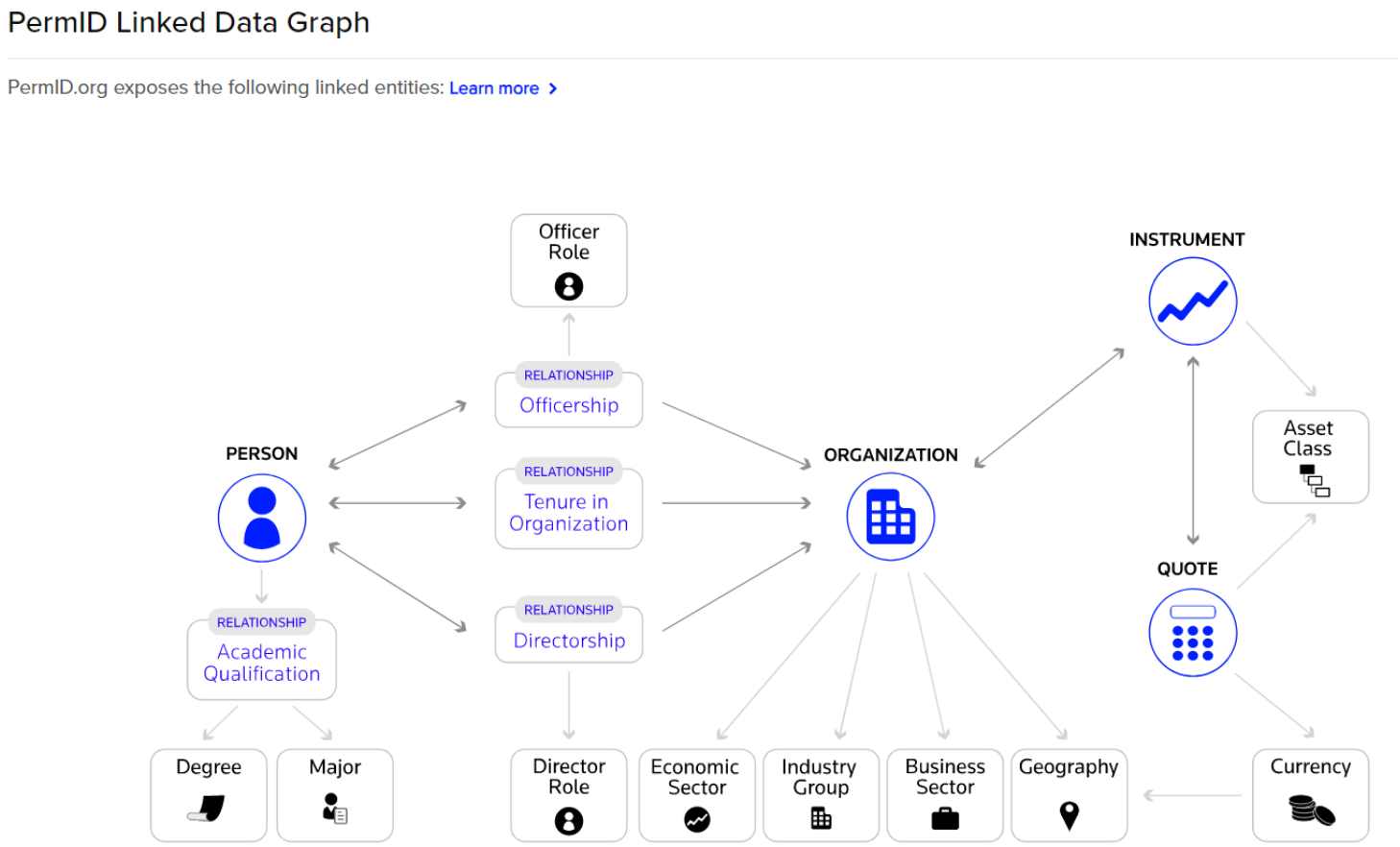
Utilize an open-source graph database

https://neo4j.com/developer/graph-database/



Data source, a Thomson – Reuters project: www.permid.org

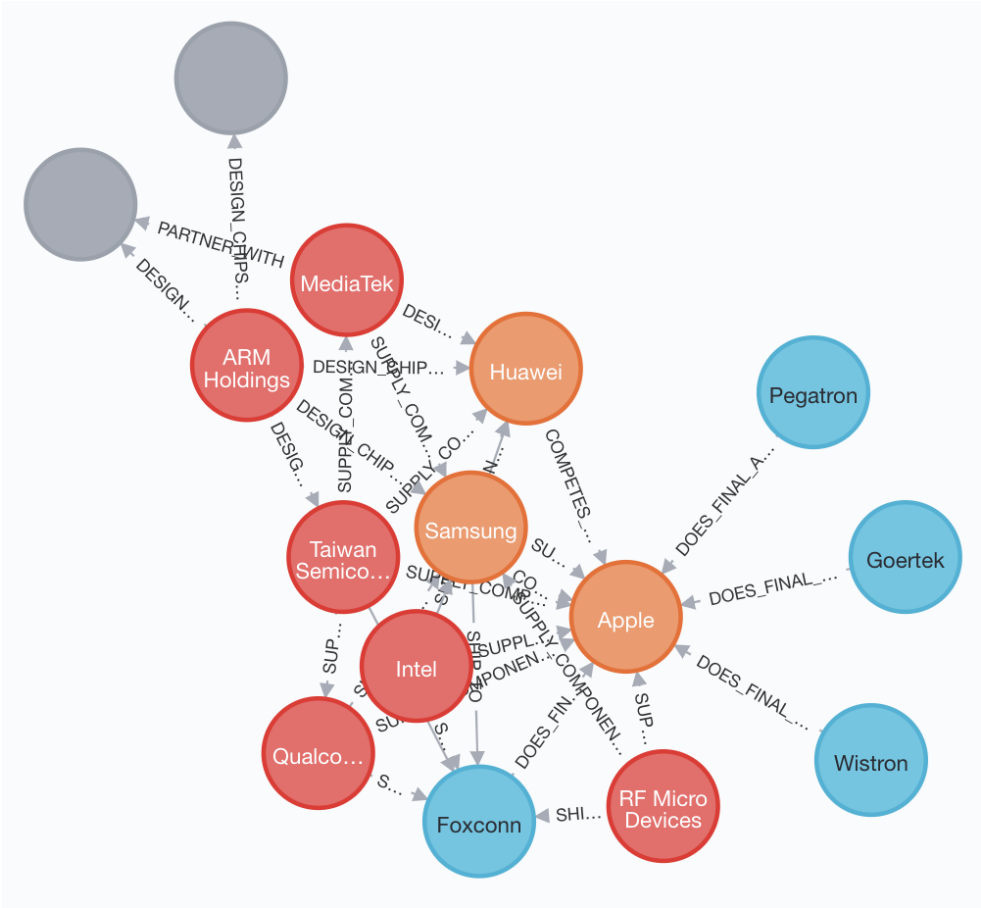


API calls with Python script to generate supply-chain entities in the 5G mobile phone space

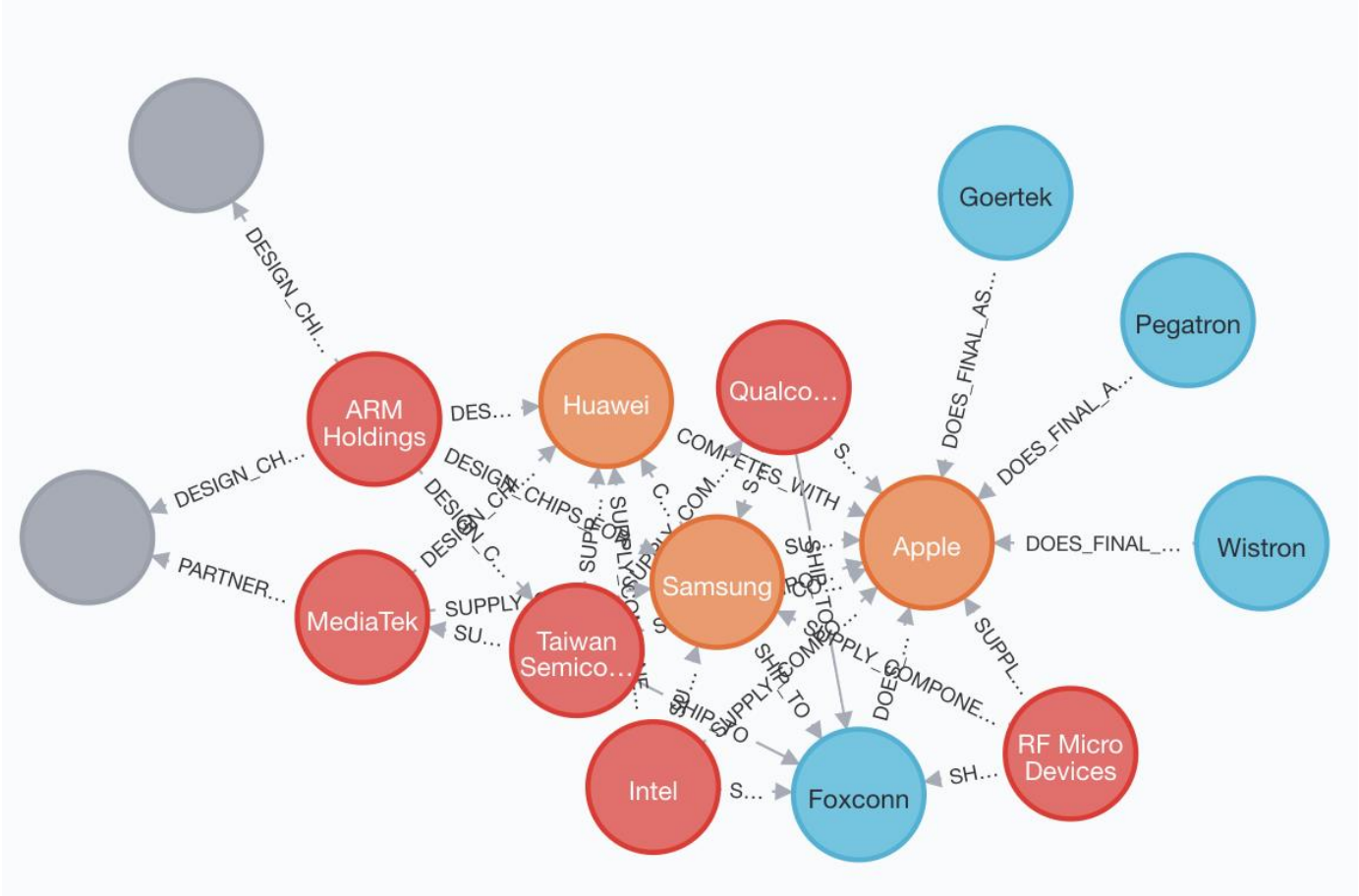
	Input_Name	Match OpenPermID	Match OrgName	Match Score	Match Level
0	Apple	https://permid.org/1-4295905573	Apple Inc	92%	Excellent
1	Intel	https://permid.org/1-4295906830	Intel Corp	92%	Excellent
2	Qualcomm	https://permid.org/1-4295907706	Qualcomm Inc	92%	Excellent
3	Samsung	https://permid.org/1-4295882451	Samsung Electronics Co Ltd	92%	Excellent

Queries on the graph database: Three major 5G smart phone brands and their suppliers

- Apple, Samsung, Huawei

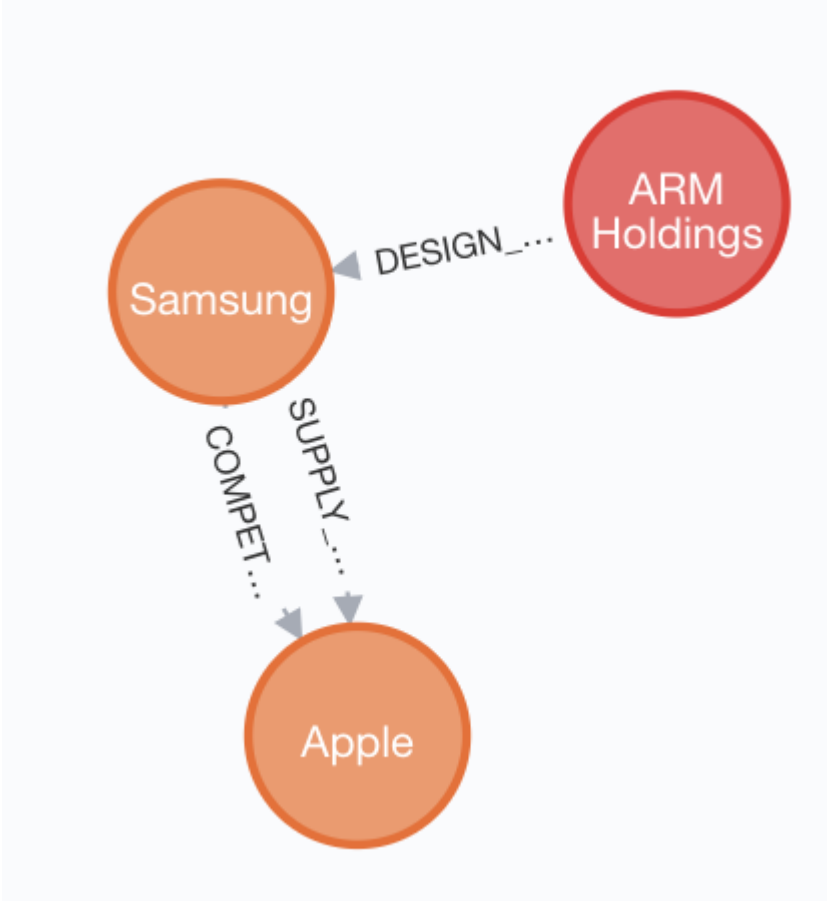


Customers network of ARM Holdings, a leading IC chip designer based in the U.K.



Apple’s “shortest path” for a backup of Qualcomm 5G chips after a legal battle

- Spoiler: through a “frenemy”



Algorithms and data science techniques, applied and under development

- Pathfinding and search (finds optimal path through Shortest Distance and other algorithms; evaluates route availability, quality)
- Community Detection (clustering, classification, partition)
- Centrality (determine the importance of distinct nodes in the network)
- Heuristic link prediction (estimates of the likehood of nodes forming a relationship)
- (Partial credit: neo4j Data Science Library)