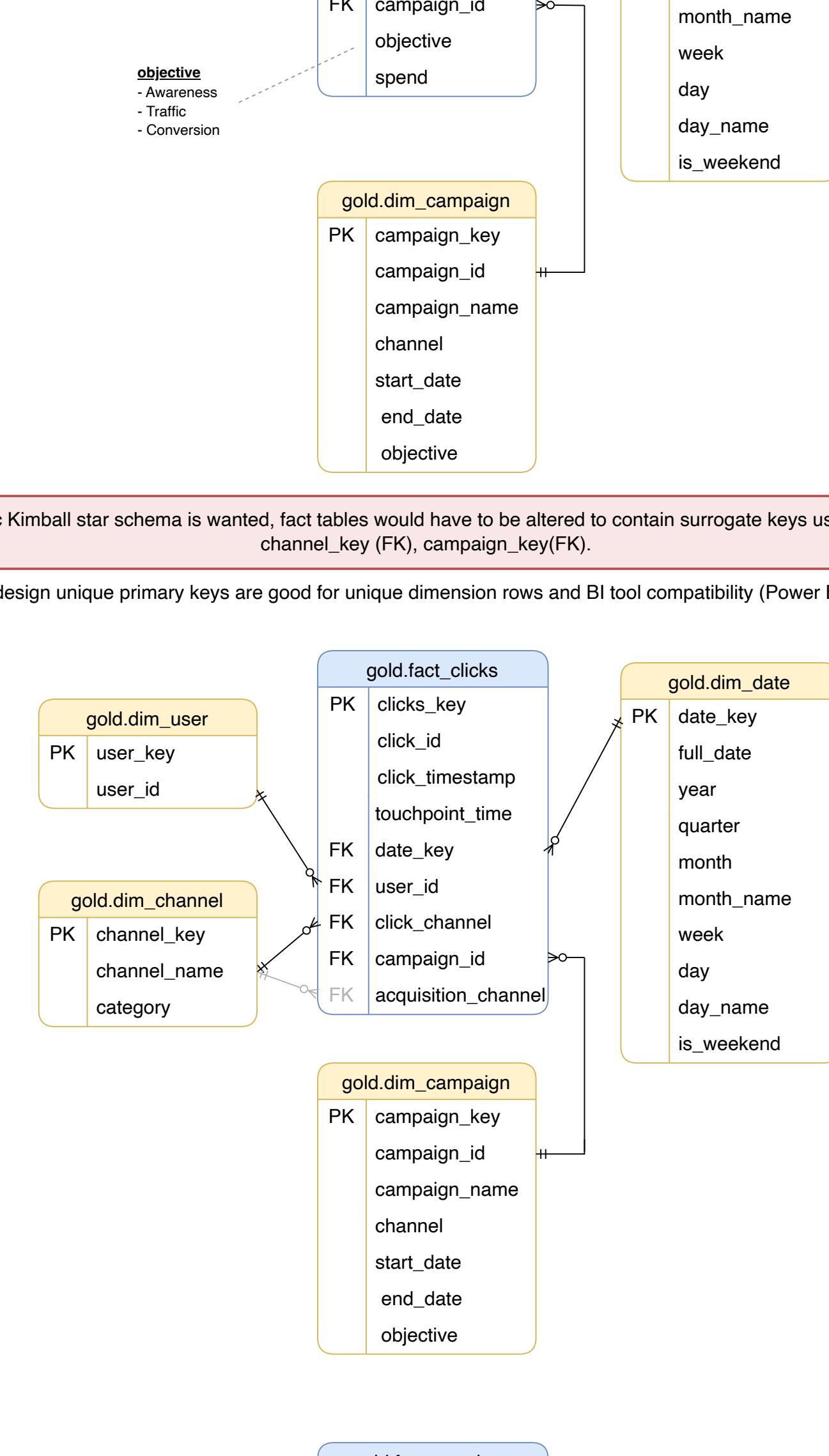


Marketing Data Mart (Star Schema and Fact Constellation)

The Gold layer follows a *star schema* for core marketing analytics (spend, clicks, sessions, touchpoints, purchases), combined with a *fact constellation* for attribution modeling. The analytical fact tables (`fact_touchpath`, `fact_attribution_linear`, `fact_attribution_last_touch`) intentionally reference `fact_purchases` through the natural key `purchase_id` to enable multi-touch attribution analysis.



If a classic Kimball star schema is wanted, fact tables would have to be altered to contain surrogate keys `user_key` (FK), `channel_key` (FK), `campaign_key` (FK).

In this design unique primary keys are good for unique dimension rows and BI tool compatibility (Power BI, Tableau).

