PERANCANGAN *DASHBOARD MONITORING* KLAIM MENGGUNAKAN POWER BI DAN ORKESTRASI DATA *PIPELINE* APACHE AIRFLOW PADA PT. ASURANSI XYZ

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ABSTRAK

PT Asuransi XYZ menghadapi kendala pengelolaan data klaim kesehatan akibat file mentah berukuran besar yang menyebabkan *crash* Microsoft Excel saat menangani lebih dari 800.000 baris data. Penelitian ini merancang *dashboard monitoring* klaim berbasis Power BI yang didukung *pipeline* ETL terorkestrasi Apache Airflow untuk menyajikan data secara cepat, akurat, dan terintegrasi. Pengembangan menggunakan metode Waterfall dengan analisis kebutuhan PIECES pada enam dimensi sistem. Hasil menunjukkan bahwa Airflow berhasil mengotomatisasi ekstraksi data dari Google Drive, transformasi dengan Python (Pandas), dan pemuatan *incremental* ke SQL *Server*. *Dashboard* Power BI menyajikan visualisasi KPI multidimensi dengan kalkulasi DAX dinamis dan fitur *flagging* otomatis untuk mendeteksi anomali keluarga (*Partial Family* dan *Simultaneous Family*). Perancangan sistem dibingkai menggunakan empat komponen arsitektur *enterprise* untuk memastikan keselarasan proses bisnis, data, aplikasi, dan infrastruktur teknologi di PT Asuransi XYZ. Hasil penelitian ini diharapkan menjadi landasan operasional bagi Data Scientist di divisi Health Claim, yang berperan sebagai Developer dalam pengoperasian dan pengembangan lanjutan sistem secara berkelanjutan.

Kata Kunci : Apache Airflow, *Dashboard*, ETL, *Monitoring* Klaim, Power BI , Arsitektur *Enterprise*

DESIGN OF A CLAIM MONITORING DASHBOARD USING POWER BI AND APACHE AIRFLOW DATA PIPELINE ORCHESTRATION AT PT. ASURANSI XYZ

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ABSTRACT

PT Asuransi XYZ faces challenges in managing health claim data due to large raw files causing Microsoft Excel crashes when handling over 800,000 rows. This research designs a claim *monitoring dashboard* using Power BI supported by an Apache Airflow-orchestrated ETL *pipeline* to present data quickly, accurately, and in an integrated manner. The Waterfall method with PIECES-based needs analysis across six system dimensions was applied. Results show Airflow successfully automated data extraction from Google Drive, transformation using Python (Pandas), and *incremental loading* into SQL *Server*. The Power BI *dashboard* presents multidimensional KPI visualizations with dynamic DAX calculations and automatic *flagging* to detect family anomaly patterns (*Partial Family* and *Simultaneous Family*). The system design is framed using four *enterprise* architecture components ensuring alignment between business processes, data, applications, and technology infrastructure at PT Asuransi XYZ. The findings of this research are expected to serve as an operational foundation for the Data Scientist in the Health Claim division, who acts as Developer in the ongoing operation and further development of the system.

Keywords: Apache Airflow, Claim Monitoring, Dashboard, ETL, Power BI , Enterprise Architecture