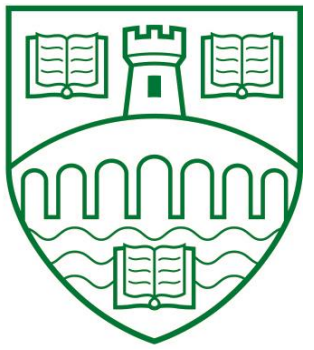


Forecasting Staff in ED

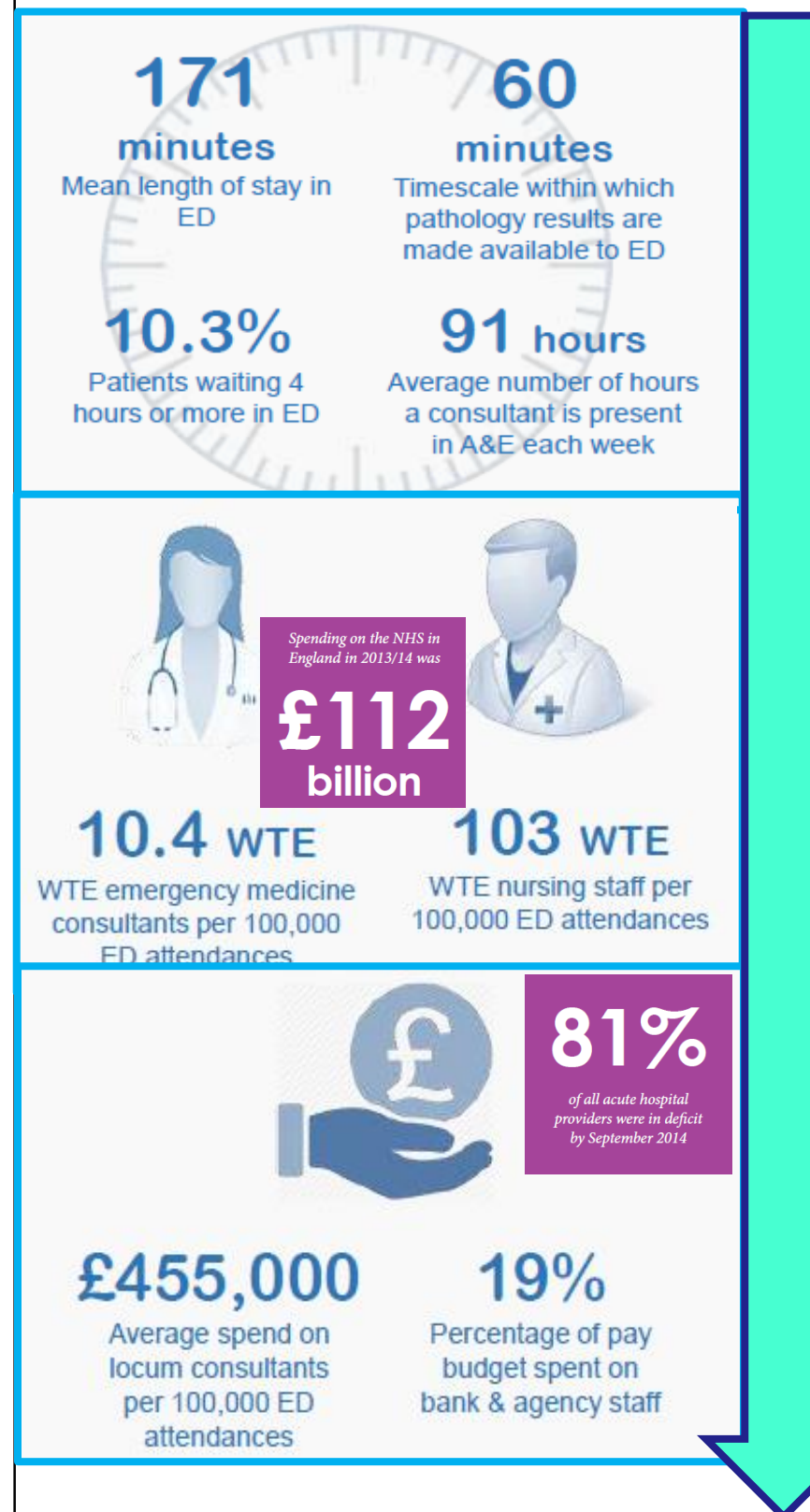


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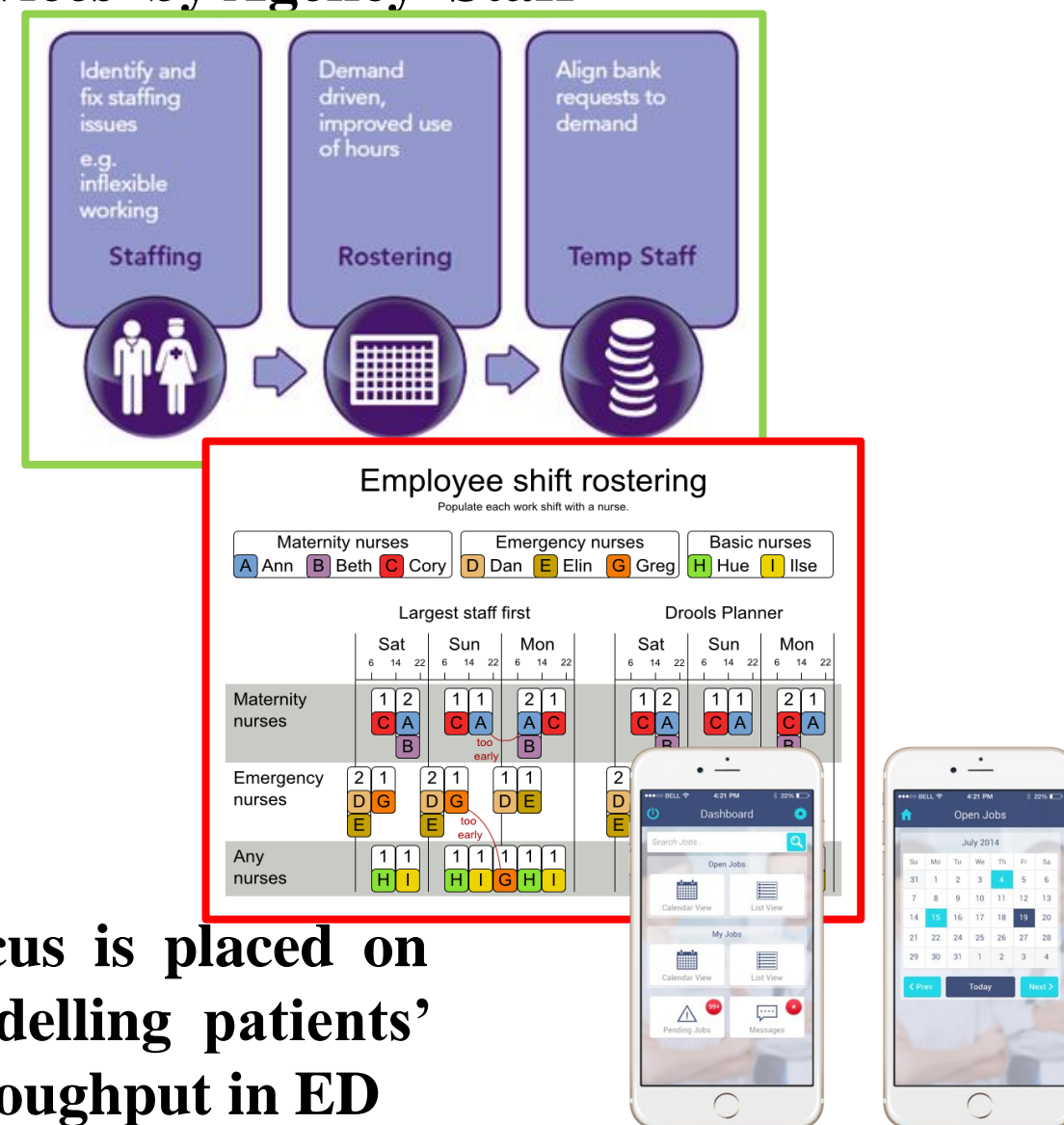


KEY FACTS ACCIDENT AND EMERGENCY DEPARTMENT (ED):



CURRENT SITUATION:

Scheduling systems with mobile applications for allocation of personnel using paid services by Agency Staff



Focus is placed on modelling patients' throughput in ED

Existing forecasting models aim to predict:

- patients admissions (Boyle 2008, 2011)
- ED crowding (Schafermeyer)
- hospital bed requirements (Farmer)
- daily surge capacity (Asplin 2008)
- patients in the queue in ED (Muthon)
- total time spent in ED (Cooke)

Project contribution and intellectual challenges are to analyze the problem in reverse order, i.e.:

- to provide a model to forecast volumes of patients arriving in ED
- to provide a tool to predict number of staff

Current Issues in ED:

- Improper staffing in ED
- Increase in spending over Agency Staff

Outcome:

- Overcrowding in ED
- Poor patient outcomes and medical errors
- Patient dissatisfaction
- NHS Trusts Budget deficit

MODEL:

Data:

- 249 NHS Trusts England
- Type 1 ED (Major A&E)
- Type 2 ED (Single Specialty)
- Type 3 ED (Minor injuries)
- Total

Input:

- 242 Excel sheet files

Data frequency:

- Monthly
- Weekly

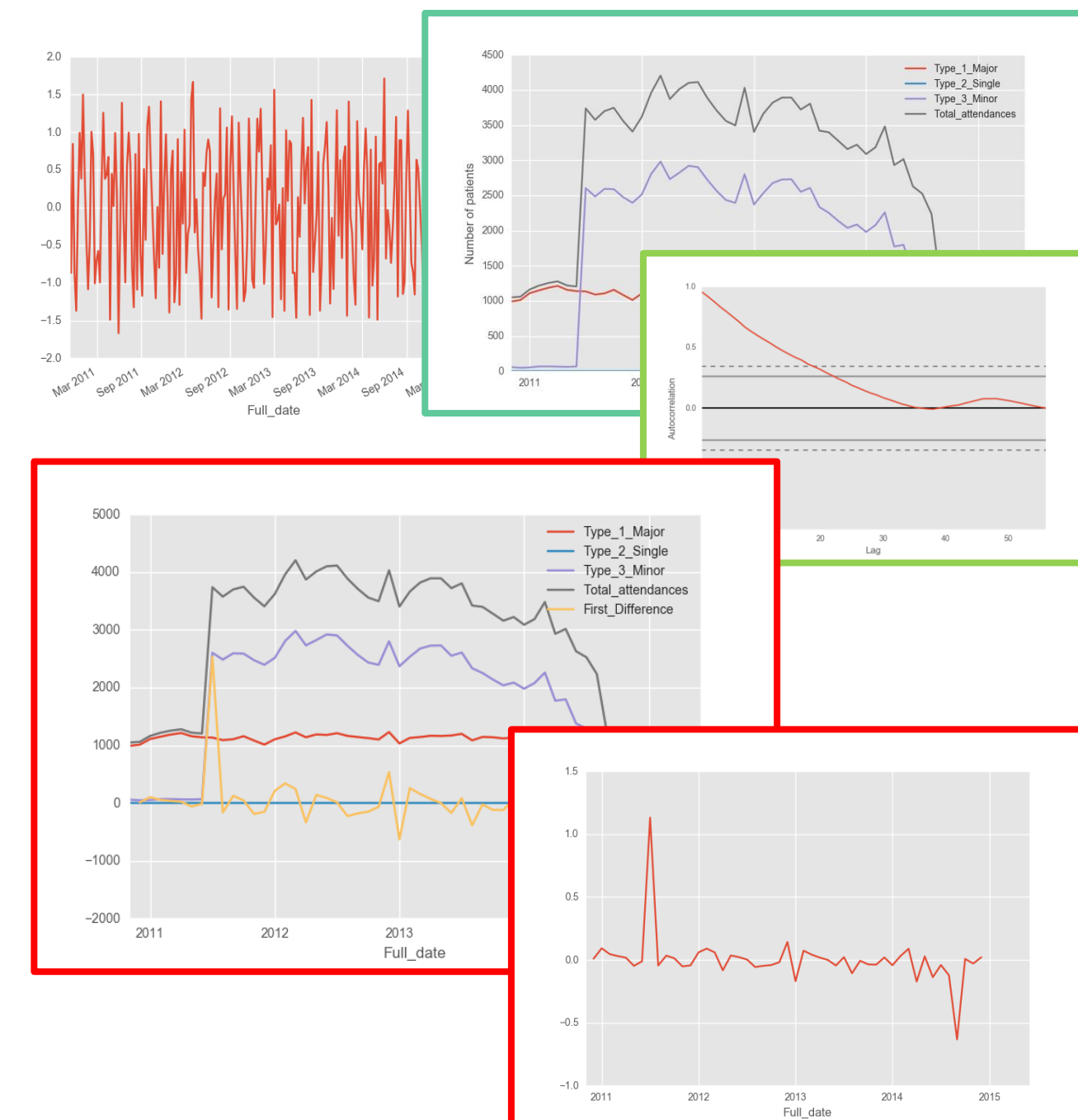
Preprocessing:

- Unique Trust Codes and Organisation Dictionary
- Check for Missing Data
- Check for Outliers
- Resampling to months
- Data normalization

Data analyses:

- Moving average
- Autocorrelation
- Dickey Fuller test
- Time Series Decomposition
 - Trend
 - Seasonality
 - Residuals
- Forecasting Patient Volume

SOUTH TYNESIDE FOUNDATION TRUST



User interface

Output

