

## DAFTAR ISI

|   |            |
|---|------------|
| <b>ABSTRAK</b> .....                            | <b>i</b>   |
| <b>ABSTRACT</b> .....                           | <b>ii</b>  |
| <b>DAFTAR ISI</b> .....                         | <b>iii</b> |
| <b>DAFTAR GAMBAR</b> .....                      | <b>v</b>   |
| <b>DAFTAR TABEL</b> .....                       | <b>vi</b>  |
| <b>BAB I PENDAHULUAN</b> .....                  | <b>1</b>   |
| <b>1.1. Latar Belakang</b> .....                | <b>1</b>   |
| <b>1.2. Rumusan Masalah</b> .....               | <b>4</b>   |
| <b>1.3. Tujuan Penelitian</b> .....             | <b>4</b>   |
| <b>1.4. Batasan Masalah</b> .....               | <b>5</b>   |
| <b>1.5. Kerangka Pemikiran Penelitian</b> ..... | <b>6</b>   |
| <b>1.6. Metodologi Penelitian</b> .....         | <b>7</b>   |
| <b>1.6.1. Pengumpulan Data</b> .....            | <b>7</b>   |
| <b>1.6.2. Pengembangan Sistem</b> .....         | <b>7</b>   |
| <b>1.7. Sistematika Penulisan</b> .....         | <b>8</b>   |
| <b>BAB II KAJIAN LITERATUR</b> .....            | <b>9</b>   |
| <b>2.1. Tinjauan Pustaka</b> .....              | <b>9</b>   |
| <b>2.2. Landasan Teori</b> .....                | <b>14</b>  |
| <b>2.2.1. Bank Digital</b> .....                | <b>14</b>  |
| <b>2.2.2. Analisis Sentimen</b> .....           | <b>15</b>  |
| <b>2.2.3. Data Mining</b> .....                 | <b>16</b>  |
| <b>2.2.4. Text Mining (Preprocessing)</b> ..... | <b>17</b>  |
| <b>2.2.5. Scrapping</b> .....                   | <b>19</b>  |
| <b>2.2.6. Google Play Store</b> .....           | <b>20</b>  |
| <b>2.2.7. Jupyter Notebook</b> .....            | <b>21</b>  |
| <b>2.2.8. CRISP-DM</b> .....                    | <b>21</b>  |
| <b>2.2.9. Naïve Bayes</b> .....                 | <b>23</b>  |

|  |           |
|--|-----------|
| <b>BAB III METODOLOGI PENELITIAN .....</b>                   | <b>25</b> |
| 3.1. Pemahaman Bisnis ( <i>Business Understanding</i> )..... | 25        |
| 3.2. Pemahaman Data ( <i>Data Understanding</i> ).....       | 26        |
| 3.3. Pengolahan Data ( <i>Data Preparation</i> ).....        | 27        |
| 3.3.1. Pengumpulan Data .....                                | 28        |
| 3.3.2. Pelabelan Data .....                                  | 29        |
| 3.3.3. <i>Preprocessing Data</i> .....                       | 30        |
| 3.4. Pemodelan ( <i>Modeling</i> ) .....                     | 33        |
| 3.5. Evaluasi ( <i>Evaluation</i> ).....                     | 36        |
| <b>BAB IV HASIL DAN PEMBAHASAN.....</b>                      | <b>37</b> |
| 4.1. Hasil <i>Data Preparation</i> .....                     | 37        |
| 4.1.1. Hasil <i>Labeling</i> .....                           | 37        |
| 4.1.2. Hasil <i>Regex Removing</i> .....                     | 38        |
| 4.1.3. Hasil <i>Case Folding</i> .....                       | 39        |
| 4.1.4. Hasil <i>Stopword Removing</i> .....                  | 39        |
| 4.1.5. Hasil <i>Tokenizing</i> .....                         | 40        |
| 4.1.6. Hasil <i>Stemming</i> .....                           | 40        |
| 4.2. Hasil <i>Modeling</i> .....                             | 41        |
| 4.3. Evaluasi Kinerja Model.....                             | 41        |
| 4.3.1. Evaluasi Data Split 90:10.....                        | 41        |
| 4.3.2. Evaluasi Data Split 80:20.....                        | 45        |
| 4.3.3. Evaluasi Data Split 70:30.....                        | 48        |
| 4.3.4. Perbandingan Data Split .....                         | 52        |
| 4.4. Hasil <i>Wordcloud</i> .....                            | 53        |
| 4.5. Implementasi Pengkodean Sistem .....                    | 53        |
| <b>BAB V KESIMPULAN DAN SARAN .....</b>                      | <b>57</b> |
| 5.1. Kesimpulan .....  | 57        |
| 5.2. Saran .....   | 58        |
| <b>DAFTAR PUSTAKA.....</b>                                   | <b>59</b> |

## DAFTAR GAMBAR

|  |    |
|--|----|
| Gambar 1. 1 Penetrasi Bank Digital di Indonesia[4] ..... | 2  |
| Gambar 1. 2 Kerangka Pemikiran .....                     | 6  |
| Gambar 2. 1 Siklus CRISP-DM[30].....                     | 22 |
| Gambar 3. 1 Proses Pengolahan Data.....                  | 28 |
| Gambar 3. 2 Arsitektur Sistem .....                      | 33 |
| Gambar 4. 1 Hasil <i>Labeling</i> .....                  | 37 |
| Gambar 4. 2 Visualisasi <i>Labeling</i> .....            | 38 |
| Gambar 4. 3 Hasil <i>Regex Removing</i> .....            | 38 |
| Gambar 4. 4 Hasil <i>Case Folding</i> .....              | 39 |
| Gambar 4. 5 Hasil <i>Stopword Removing</i> .....         | 39 |
| Gambar 4. 6 Hasil <i>Tokenizing</i> .....                | 40 |
| Gambar 4. 7 Hasil <i>Stemming</i> .....                  | 40 |
| Gambar 4. 8 Hasil <i>Modeling</i> .....                  | 41 |
| Gambar 4. 9 Confusion Matrix Pengujian 1 .....           | 42 |
| Gambar 4. 10 Hasil Pengujian 1 .....                     | 43 |
| Gambar 4. 11 Confusion Matrix Pengujian 2.....           | 45 |
| Gambar 4. 12 Hasil Pengujian 2.....                      | 46 |
| Gambar 4. 13 Confusion Matrix Pengujian 3.....           | 49 |
| Gambar 4. 14 Hasil Pengujian 3.....                      | 50 |
| Gambar 4. 15 Visualisasi <i>Wordcloud</i> .....          | 53 |
| Gambar 4. 16 Kode <i>Scrapping</i> .....                 | 53 |
| Gambar 4. 17 Kode <i>Regex Removing</i> .....            | 54 |
| Gambar 4. 18 Kode <i>Case Folding</i> .....              | 54 |
| Gambar 4. 19 Kode <i>Stopword Removal</i> .....          | 54 |
| Gambar 4. 20 Kode <i>Tokenizing</i> .....                | 54 |
| Gambar 4. 21 Kode <i>Stemming</i> .....                  | 55 |
| Gambar 4. 22 Kode <i>TF-IDF</i> .....                    | 55 |
| Gambar 4. 23 Kode <i>Naive Bayes Multinomial</i> .....   | 55 |
| Gambar 4. 24 Kode <i>Testing</i> .....                   | 56 |
| Gambar 4. 25 Kode <i>Pickle</i> .....                    | 56 |
| Gambar 4. 26 Kode <i>Wordcloud</i> .....                 | 56 |

## DAFTAR TABEL

|  |    |
|--|----|
| Tabel 2. 1 Ringkasan Tinjauan Pustaka .....                    | 12 |
| Tabel 3. 1 Data Aplikasi Bank Digital.....                     | 27 |
| Tabel 3. 2 Data Ulasan Bank Digital .....                      | 29 |
| Tabel 3. 3 Pelabelan Data.....                                 | 29 |
| Tabel 3. 4 Proses <i>Regex Removing</i> .....                  | 30 |
| Tabel 3. 5 Proses <i>Case Folding</i> .....                    | 31 |
| Tabel 3. 6 Proses <i>Stopword Removing</i> .....               | 31 |
| Tabel 3. 7 Proses <i>Tokenizing</i> .....                      | 32 |
| Tabel 3. 8 Proses <i>Stemming</i> .....                        | 32 |
| Tabel 3. 9 Contoh Data <i>Training</i> .....                   | 34 |
| Tabel 3. 10 Perhitungan <i>Multinomial Naive Bayes</i> .....   | 35 |
| Tabel 3. 11 Data Uji.....                                      | 36 |
| Tabel 3. 12 Model Probabilistik .....                          | 36 |
| Tabel 4. 1 Perbandingan Evaulasi Untuk Setiap Data Split ..... | 52 |

