ABSTRAKSI


Quick Cost Estimator adalah sebuah aplikasi yang berfungsi untuk memudahkan dalam analisa harga satuan pekerjaan dan pembuatan rencana anggaran biaya. Dengan aplikasi Quick Cost Estimator pengguna dapat meningkatkan efisiensi dalam proses estimasi sebuah proyek konstruksi.

Kata kunci : Rencana Anggaran Biaya, Analisa Harga Satuan Pekerjaan, Konstruksi, Quick Cost Estimator

ABSTRACT

Analysis work unit price is an important process in the process of construction project cost estimates. Analysis of unit price of good jobs will sustain a good budgeting plan as well. Since seeing the process work unit price analysis and cost statutes making plans takes a long time and cause problems by making it manually. Then the authors design an application to accomodate unit price analysis of job and making computerized budgeting plan.

Quick Cost Estimator is an application used to simplify the analysis, unit price and job creation budgeting plan. Quick Cost Estimator with applications users can increase efficiency in the estimation process of a construction project.

Keyword : Budget plan, Unit Price Analysis, Construction, Quick Cost Estimator
## DAFTAR ISI

<table>
<thead>
<tr>
<th>Bab</th>
<th>Judul</th>
<th>Halaman</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>KATA PENGANTAR</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>ABSTRAKSI</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>ABSTRACT</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>DAFTAR ISI</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>DAFTAR GAMBAR</td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>DAFTAR TABEL</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>DAFTAR LAMPIRAN</td>
<td></td>
</tr>
</tbody>
</table>
| 1 | BAB I PENDAHULUAN | 1
1.1 | Latar Belakang | 1
1.2 | Rumusan Masalah | 2
1.3 | Tujuan Pembahasan | 2
1.4 | Ruang Lingkup Kajian | 2
1.5 | Sistematika Penyajian | 3
| 5 | BAB II KAJIAN TEORI | 5
2.1 | Estimasi biaya | 5
2.2 | Jenis - Jenis Pekerjaan | 6
2.3 | Harga Satuan Pekerjaan | 6
2.3.1 | Harga Bahan | 6
2.3.2 | Upah Pekerjaan | 10
2.2.1 | Entity Relationship Diagram (ERD) | 12
2.2.1.1 | Definisi | 12
2.2.1.2 | Komponen ERD | 12
2.2.1.3 | Entitas | 12
2.2.1.4 | Relationship | 12
2.2.1.5 | Atribut | 13
2.2.1.6 | Connectivity | 15
2.2.2 | Data Flow Diagram (DFD) | 16
2.2.2.1 | Definisi | 16
2.2.2.2 | Simbol – Simbol DFD | 16
2.2.2.3 | Elemen lingkungan yang berhubungan dengan sistem | 16
2.2.2.4 | Proses | 17
2.2.2.5 | Arus data (data flow) | 17
2.2.2.6 | Penyimpanan data (data storage) | 17
2.2.3 | DFD bertingkat | 18
2.2.3.1 | Diagram konteks | 18
2.2.3.2 | Diagram gambar n | 18
2.2.4 | Data Dictionary (Kamus Data) | 19
2.2.4.1 | Definisi | 19
2.2.4.2 | Notasi Kamus Data | 20
2.2.5 | Process Specification (PSPEC) | 20
2.2.6 | WPF (Windows Presentation Foundation) | 20
2.2.7 | XAML | 21
2.2.8 | Data Binding | 22
2.2.9 | XML | 23
2.2.10 | LINQ | 23
2.2.11 | LINQ to XML | 24
| 26 | BAB III ANALISIS DAN RANCANGAN SISTEM | 26
3.1 | Proses Bisnis | 26
3.2 | Rancangan Diagram Entitas | 27
DAFTAR GAMBAR

Gambar 1 Simbol Entitas .................................................................................................................................................. 12
Gambar 2 Simbol Relationship........................................................................................................................................... 13
Gambar 3 Simbol Atribut Key ............................................................................................................................................. 13
Gambar 4 Simbol Atribut Simpel ....................................................................................................................................... 13
Gambar 5 Simbol Atribut Multivalued ............................................................................................................................... 14
Gambar 6 Simbol Atribut Composite ............................................................................................................................... 14
Gambar 7 Simbol Atribut Derivatif ................................................................................................................................. 14
Gambar 8 Connectivity One to One  ............................................................................................................................. 15
Gambar 9 Connectivity One to Many ............................................................................................................................. 15
Gambar 10 Connectivity Many to Many .......................................................................................................................... 15
Gambar 11 Simbol Terminator .......................................................................................................................................... 16
Gambar 12 Simbol Proses................................................................................................................................................... 17
Gambar 13 Simbol Arus Data .......................................................................................................................................... 17
Gambar 14 Simbol Penyimpanan Data ........................................................................................................................... 18
Gambar 15 Diagram Entitas .............................................................................................................................................. 27
Gambar 16 Diagram Konteks ........................................................................................................................................... 28
Gambar 17 DFD Level 1 ................................................................................................................................................... 29
Gambar 18 DFD Level 2 Proses Pengelolaan Data BOQ 1.0 ......................................................................................... 30
Gambar 19 DFD Level 2 Proses Pengelolaan Data Cost 2.0 ....................................................................................... 31
Gambar 20 DFD Level 2 Proses Pengelolaan Data Cost Analysis 3.0 ..................................................................... 31
Gambar 21 DFD Level 2 Proses Pengelolaan Data Master 4.0 ................................................................................... 32
Gambar 22 Splash Screen ................................................................................................................................................ 39
Gambar 23 Welcome Screen .......................................................................................................................................... 40
Gambar 24 Halaman Bill Of Quantity ............................................................................................................................ 41
Gambar 25 Halaman Cost Analysis ................................................................................................................................ 42
Gambar 26 Halaman Material, Labor, Tools ................................................................................................................... 43
Gambar 27 Halaman Print Report .................................................................................................................................. 44
Gambar 28 Halaman Concrete Calculator ....................................................................................................................... 44
Gambar 29 Halaman Splash ............................................................................................................................................ 45
Gambar 30 Welcome Screen ........................................................................................................................................... 46
Gambar 31 New Project .................................................................................................................................................... 47
Gambar 32 Browse Folder ............................................................................................................................................... 47
Gambar 33 Open Project ................................................................................................................................................. 48
Gambar 34 Menu File ...................................................................................................................................................... 49
Gambar 35 Menu Tools .................................................................................................................................................. 49
Gambar 36 Menu About .................................................................................................................................................. 50
Gambar 37 About Quick Cost Estimator ....................................................................................................................... 50
Gambar 38 Halaman Bill of Quantity ............................................................................................................................. 51
Gambar 39 Halaman Cost Analysis .................................................................................................................................. 52
Gambar 40 Halaman Material, Labor, Tool ...................................................................................................................... 53
Gambar 41 Hasil Cetakan Laporan ................................................................................................................................... 54
Gambar 42 Halaman Concrete Calculator ..................................................................................................................... 54
Gambar 43 Proses Input Data Material ........................................................................................................................... 60
Gambar 44 Proses Input Upah Pekerja ........................................................................................................................... 61
Gambar 45 Proses Analisa Beton K-250 .......................................................................................................................... 62
Gambar 46 Proses Analisa Pembesian Besi Polos ............................................................................................................. 63
Gambar 47 Proses Analisa Pembesian Besi Ulir .................................................................................................................. 64
Gambar 48 Proses Analisa Bekisting Pendoran .............................................................................................................. 65
Gambar 49 Proses Analisa Bekisting Sloof ..................................................................................................................... 66
Gambar 50 Proses Analisa Bekisting Kolom ............................................................ 67
Gambar 51 Proses Analisa Bekisting Balok ............................................................. 68
Gambar 52 Proses Analisa Lantai Kerja ................................................................. 69
Gambar 53 Proses Boq Pekerjaan Pondasi ............................................................. 70
Gambar 54 Proses Boq Pekerjaan Slop ................................................................. 71
Gambar 55 Proses Boq Pekerjaan Balok ................................................................. 72
Gambar 56 Proses Boq Pekerjaan Kolom ................................................................. 73
Gambar 57 Proses Concrete Calculator .................................................................. 74
Gambar 58 Testing New Project – Penanganan Input Kosong ............................ 75
Gambar 59 Testing New Project – Penanganan Folder Telah Terisi .................... 75
Gambar 60 Testing Open Project – Penanganan Open Project Tidak Valid........... 76
Gambar 61 Testing Add Bill Of Quantity – Penanganan Input Kosong ............... 76
Gambar 62 Testing Save Bill Of Quantity – Penanganan Category Kosong .......... 77
Gambar 63 Testing Save Bill Of Quantity – Penanganan Quantity Kosong ......... 77
Gambar 64 Testing Edit Bill Of Quantity – Penanganan Input Kosong ............... 78
Gambar 65 Testing Edit Bill Of Quantity – Penanganan Quantity Kosong .......... 78
Gambar 66 Testing Delete Bill Of Quantity – Penanganan Input Kosong .......... 79
Gambar 67 Testing Insert Cost Analysis – Penanganan Input Kosong ............... 80
Gambar 68 Testing Insert Cost Analysis Penanganan Job Cost Analysis Name Kosong ................................................................. 80
Gambar 69 Testing Insert Cost Analysis – Penanganan Unit Kosong ............... 80
Gambar 70 Testing Update Cost Analysis – Penanganan Input Kosong ............. 81
Gambar 71 Testing Update Cost Analysis – Penanganan Cost Analysis Name Kosong ................................................................. 81
Gambar 72 Testing Update Cost Analysis – Penanganan Unit Kosong ............... 82
Gambar 73 Testing Delete Cost Analysis – Penanganan Input Kosong ............... 82
Gambar 74 Testing Insert Cost Analysis Detail – Penanganan Input Kosong ........ 83
Gambar 75 Testing Insert Cost Analysis Detail Penanganan Coefficient Kosong .... 83
Gambar 76 Testing Edit Cost Analysis Detail – Penanganan Input Kosong ........... 84
Gambar 77 Testing Edit Cost Analysis Detail Penanganan Coefficient Kosong .... 85
Gambar 78 Testing Delete Cost Analysis Detail – Penanganan Input Kosong ....... 86
Gambar 79 Testing Insert Add Material, Labor, Tool – Penanganan Input Kosong 86
Gambar 80 Testing Insert Add Material, Labor, Tool – Penanganan Data Name Kosong ................................................................. 87
Gambar 81 Testing Insert Add Material, Labor, Tool – Penanganan Data Type Kosong ................................................................. 87
Gambar 82 Testing Insert Add Material, Labor, Tool – Penanganan Unit Kosong .. 87
Gambar 83 Testing Insert Add Material, Labor, Tool – Penanganan Unit Price Kosong ................................................................. 88
Gambar 84 Testing Insert Edit Material, Labor, Tool – Penanganan Input Kosong . 89
Gambar 85 Testing Insert Edit Material, Labor, Tool – Penanganan Data Name Kosong ................................................................. 89
Gambar 86 Testing Insert Edit Material, Labor, Tool – Penanganan Data Type Kosong ................................................................. 89
Gambar 87 Testing Insert Update Material, Labor, Tool – Penanganan Unit Kosong ................................................................. 89
Gambar 88 Testing Insert Edit Material, Labor, Tool – Penanganan Unit Price Kosong ................................................................. 90
Gambar 89 Testing Delete Material, Labor, Tool – Penanganan Input Kosong ...... 90
DAFTAR TABEL

<table>
<thead>
<tr>
<th>Tabel</th>
<th>Deskripsi</th>
<th>Halaman</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Memasang 1 m³ pondasi batu belah, campuran 1 PC : 3 PP</td>
<td>7</td>
</tr>
<tr>
<td>II</td>
<td>Memasang 1 m³ pondasi batu belah, campuran 1 PC : 4 PP</td>
<td>8</td>
</tr>
<tr>
<td>III</td>
<td>Pekerjaan Pondasi</td>
<td>8</td>
</tr>
<tr>
<td>IV</td>
<td>Pekerjaan Beton</td>
<td>8</td>
</tr>
<tr>
<td>V</td>
<td>Notasi Kamus Data</td>
<td>20</td>
</tr>
<tr>
<td>VI</td>
<td>Process Specification</td>
<td>20</td>
</tr>
<tr>
<td>VII</td>
<td>PSPEC Proses Tambah Data BOQ</td>
<td>32</td>
</tr>
<tr>
<td>VIII</td>
<td>PSPEC Proses Edit Data BOQ</td>
<td>33</td>
</tr>
<tr>
<td>IX</td>
<td>PSPEC Proses Hapus Data BOQ</td>
<td>33</td>
</tr>
<tr>
<td>X</td>
<td>PSPEC Proses Tambah Data Cost</td>
<td>33</td>
</tr>
<tr>
<td>XI</td>
<td>PSPEC Proses Edit Data Cost</td>
<td>34</td>
</tr>
<tr>
<td>XII</td>
<td>PSPEC Proses Hapus Data Cost</td>
<td>34</td>
</tr>
<tr>
<td>XIII</td>
<td>PSPEC Proses Tambah Data Cost Analysis</td>
<td>34</td>
</tr>
<tr>
<td>XIV</td>
<td>PSPEC Proses Edit Data Cost Analysis</td>
<td>35</td>
</tr>
<tr>
<td>XV</td>
<td>PSPEC Proses Hapus Data Cost Analysis</td>
<td>35</td>
</tr>
<tr>
<td>XVI</td>
<td>PSPEC Proses Tambah Data Master</td>
<td>35</td>
</tr>
<tr>
<td>XVII</td>
<td>PSPEC Proses Edit Data Master</td>
<td>36</td>
</tr>
<tr>
<td>XVIII</td>
<td>PSPEC Proses Hapus Data Master</td>
<td>36</td>
</tr>
<tr>
<td>XIX</td>
<td>PSPEC Proses Laporan</td>
<td>36</td>
</tr>
<tr>
<td>XX</td>
<td>Kamus Data DataStore_BOQ</td>
<td>37</td>
</tr>
<tr>
<td>XXI</td>
<td>Kamus Data DataStore_Cost</td>
<td>37</td>
</tr>
<tr>
<td>XXII</td>
<td>Kamus Data DataStore_CostAnalysis</td>
<td>38</td>
</tr>
<tr>
<td>XXIII</td>
<td>Kamus Data DataStore_Master</td>
<td>38</td>
</tr>
<tr>
<td>XXIV</td>
<td>Daftar Harga Satuan Bahan</td>
<td>56</td>
</tr>
<tr>
<td>XXV</td>
<td>Daftar Upah Pekerja</td>
<td>57</td>
</tr>
<tr>
<td>XXVI</td>
<td>Analisa Harga Satuan Pekerja</td>
<td>58</td>
</tr>
<tr>
<td>XXVII</td>
<td>Daftar Jenis Pekerja</td>
<td>59</td>
</tr>
<tr>
<td>XXVIII</td>
<td>Analisa Harga Satuan Beton K-250</td>
<td>62</td>
</tr>
<tr>
<td>XXIX</td>
<td>Analisa Harga Satuan Pembesian dengan Besi Polos / Ulir</td>
<td>63</td>
</tr>
<tr>
<td>XXX</td>
<td>Analisa Harga Satuan Bekisting Pondasi</td>
<td>64</td>
</tr>
<tr>
<td>XXXI</td>
<td>Analisa Harga Satuan Bekisting Sloof</td>
<td>65</td>
</tr>
<tr>
<td>XXXII</td>
<td>Analisa Harga Satuan Bekisting Kolom</td>
<td>66</td>
</tr>
<tr>
<td>XXXIII</td>
<td>Analisa Harga Satuan Bekisting Balok</td>
<td>67</td>
</tr>
<tr>
<td>XXXIV</td>
<td>Analisa Harga Satuan Lantai Kerja</td>
<td>68</td>
</tr>
<tr>
<td>XXXV</td>
<td>Item pekerjaan pondasi</td>
<td>70</td>
</tr>
<tr>
<td>XXXVI</td>
<td>Item pekerjaan sloof</td>
<td>71</td>
</tr>
<tr>
<td>XXXVII</td>
<td>Item pekerjaan balok</td>
<td>72</td>
</tr>
<tr>
<td>XXXVIII</td>
<td>Item pekerjaan kolom</td>
<td>72</td>
</tr>
<tr>
<td>XXXIX</td>
<td>Test Case Form New Project</td>
<td>75</td>
</tr>
<tr>
<td>XL</td>
<td>Test Case Form Open Project</td>
<td>76</td>
</tr>
<tr>
<td>XLI</td>
<td>Test Case Add Bill Of Quantity</td>
<td>76</td>
</tr>
<tr>
<td>XLII</td>
<td>Test Case Edit Bill Of Quantity</td>
<td>78</td>
</tr>
<tr>
<td>XLIII</td>
<td>Test Case Delete Bill Of Quantity</td>
<td>79</td>
</tr>
<tr>
<td>XLIV</td>
<td>Test Case Add Cost Analysis</td>
<td>79</td>
</tr>
<tr>
<td>XLV</td>
<td>Test Case Edit Cost Analysis</td>
<td>81</td>
</tr>
<tr>
<td>XLVI</td>
<td>Test Case Delete Bill Of Quantity</td>
<td>82</td>
</tr>
<tr>
<td>XLVII</td>
<td>Test Case Add Cost Analysis Detail</td>
<td>82</td>
</tr>
<tr>
<td>XLVIII</td>
<td>Test Case Edit Cost Analysis Detail</td>
<td>84</td>
</tr>
<tr>
<td>XLIX</td>
<td>Test Case Delete Cost Analysis Detail</td>
<td>85</td>
</tr>
</tbody>
</table>
Tabel L Test Case Add Material, Labor, Tool...........................................................86
Tabel LI Test Case Edit Material, Labor, Tool..........................................................88
Tabel LII Test Case Delete Material, Labor, Tool.....................................................90
DAFTAR LAMPIRAN

LAMPIRAN A RENCANA ANGGARAN BIAYA ..........................................................A
LAMPIRAN B GAMBAR DETAIL STRUKTUR ..........................................................B