

CHAPTER III

METHODOLOGY

3.1 Software

3.1.1 Equipment

This research used a computer laptop model: Intel(R) Core(TM) i5-2410M CPU at 2.30 GHz, RAM: 8 GB and 64-bit operating system to generate and simulate the graphical user interface (GUI).

3.1.2 Software

This research used MATLAB 2012a as a program to generate and simulate the GUI and used microsoft excel to transfer well data to MATLAB.

3.2 Procedures

3.2.1 Development of a User-friendly Software

In this step, a user-friendly software was created by using the GUI in MATLAB. Real-time well trajectory was calculated by balanced tangential method and T&D calculation was based on Prurapark model (2009) which is based on a soft-string model and four operation modes which are rotating off the bottom (RoffB), pulling out of the hole (POH), running in the hole (RIH), and rotating on the bottom (RonB). The GUI can calculate all types of well profile. If Inclination (Inc) is zero the program considers it as a vertical section. If Inc increases the program considers it as a build section and when Inc decreases the program considers it as a drop section.

3.2.2 Collection of Actual Data from Drilling Department

To be able to create real-time software, a lot of data were required to make the program accurate and useful. Data inputs can be divided into two parts as shown in Table 3.1 and Table A1.

Table 3.1 Data inputs of the GUI

Real-time Well Trajectory	T&D
Azimuth (°)	Weight on bit (lbf)
Inclination (°)	Wellbore diameter (in)
Measured Depth (ft)	Bit diameter (in)
	Unit weight of drillpipe in air (lb/ft)
	Density of drilling fluid (lb/gal)
	Density of drillpipe material (lb/gal)
	Deltatorque (ft-lbf)

3.2.3 Simulation of Software

After software was completed and data were inputted to the program, actual field data were brought to compare with the calculated data.