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HCM UNIVERSITY OF TECHNOLOGY
FACULTY OF MECHANICAL ENGINEERING - MECHATRONICS DEPARTMENT



ENGINEERING INTERNSHIP REPORT

Air Compressor Modeling using MATLAB

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Acknowledgement

To complete the internship report topic, first of all I would like to send my sincere thanks and deep gratitude to the lecturers of Ho Chi Minh City University of Technology for providing great opportunities so that I have more time for technical internships.

In particular, I would like to thank Dr. Nguyen Tan Tien, who wholeheartedly guided and helped me complete this internship report topic.

Finally, I also would like to thank my teammates, Nguyen Dang Hung and Nguyen Khanh Trung and the seniors at DCSELab for their help and support.

At the same time, the school has given me the opportunity to practice where I love, let me step into real life to apply the knowledge that my teachers have taught. Through this internship, I realize many new and useful things in the preliminary design of practical machines to help me in my future work.

Due to my lack of knowledge and experience regarding the modeling skills, this report is very likely be prone to mistakes. I am looking forward to your response for future improvements.

Chapter 1

Overview of the Company

1.1 Tabular Re-arrangement

Example:

The sterilization temperature for sterilizing the tank should be at least 135°C for 30 min. The sterilizing temperature at the condensomat should not fall below 125°C.

You can "tabularize" the body of paragraph into a table, which is more concise and readable.

Minimum temperatures for sterilizing

location	temperature
at the tank	temp. = 135°C, 30 min
at the condensomat	temp. = 125°C

1.2 Choosing between diagram, table and text descriptions

In general:

- Text description is exact but hard to read.
- Table is exact but still not easy to read.
- Diagram is not exact but easy to visualize and memorable.
- Placing the right thing on a page is essential for a great report.

The next important key point to remember is called text-figure-relationship, which is how and where you place texts and figures in a page:

- Placing figures (diagrams and tables) in an appendix is good for positioning but leads to turning pages multiple times (bad text-figure-relationship).
- Placing figures near/on the same page as the explaining text is a good text-figure-relationship. If the report is double-sided, the figure should be on the same double-page as the text (the diagram and explaining text should either be on odd or even pages).
- Cross referencing to a figure with a statement and add the phrase "Figure xx." at the end after a comma.
- Drawing/scanning the figures as early as possible while writing the explaining text.

Graphics simplify reality (e.g. principle drawing, map), explain abstract ideas by means of spatial arrangement (e.g. bar chart, pie chart, tree chart), create associations (e.g. logo and pictogram).

There are 13 basic rules for information-effective design of figures:

1. Accentuate important items.
2. Delete/leave out unimportant items (use max. 4-7 graphic elements in 1 picture or it is overloaded).
3. Line thickness and font size must be sufficient. Figures should be readable at a distance of 30-40 cm.
4. Relationship of graphic elements should be emphasized (lines, arrows, columns, rows, common color). These should be specified in detail (character of the relationship, meaning behind it) using labels and explanations in the legend.
5. Objects near each other belong together.
6. An element placed above or below other elements is regarded as hierarchically super-ordinate or sub-ordinate.
7. Logical/chronological sequence has its elements placed beside each other.
8. Circular arrangement is thought as a cycle or repeated sequence.
9. An element surrounding another element is understood as the outer includes the inner element.

10. Boxes, bars, lines, columns, etc. must be clearly marked (text labels or graphical explanations).
11. 1 type of element may have only 1 function within one/series of figures (e.g. arrows for vector direction).
12. x -axis is horizontal, y -axis is vertical
13. Look up for standardized symbols (e.g. DIN 66001 for flow charts, DIN 32520, DIN 66261).

Chapter 2

Summary and Conclusions

During the internship, I had a chance to get acquainted with a new working environment. I have accumulated experience in industry knowledge as well as experience skills above.

I was trained in problem solving skills in many stages, trying to complete the job in the shortest time, boldly exchanging and sharing knowledge. At the same time, it also fosters a lot of knowledge about graphic software as well as programming skills to solve the problems learned in school but professionally and saves more time.

Shortcomings: the skill is not mature which still takes a long time to execute; the ability to think and propose design plans is limited due to the lack of practical experience and in-depth knowledge.

Solution: practice more software skills, add additional specialized knowledge that is lacking.