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Important Note: Students who will do research concerning human subjects, should submit “Human Subjects Research Ethics Review Application” to the Administrative Office of Human Subjects Research Ethics Review Committee of the Research Planning Division (Research Promotion Department) and get an approval first before you can start with your research.

About Tokyo Institute of Technology’s Human Subjects Research Ethics Review Policy:

<http://www.rpd.titech.ac.jp/rpddiv/somu/hsr/hsr01.html>

Please consult with your research supervisor regarding this matter.

1. Purpose of the Independent Research Project (IRP)

- a. Tokyo Tech Study Guide (Bachelor’s degree program) defines the purpose of Independent Research Project (IRP) as the following. “Independent Research Project (IRP) is one of the courses in major course groups and credits are given. This is required as a prerequisite for graduation in the university. It usually is to be completed on the first semester or the second semester of the fourth year. The purpose of the Independent Research Project (IRP) is to integrate various approaches such as theory, experiment, survey, and planning on a specific

theme, and to deeply understand the major courses by bringing together the academic abilities that have been cultivated. Through IRP, one can deepen the specific theme and learn how to summarize the research as well as how to prepare and publish reports, etc. " (Source: Tokyo Tech Study Guide 2021, Accessed on June 29, 2021, https://www.titech.ac.jp/guide/guide_2021/gakubu1/)

- b. The Independent Research Project final report should not only describe the research outcomes but also clearly describe how the various approaches such as theory, experiment, survey, and planning were conducted. These items are the requirements for the IRP final report.
- c. In order to describe these requirements, it is important to grasp and understand the results and findings of existing related research. This process means that one should clarify the significance, novelty, and uniqueness of the research. For this, it is necessary to appropriately and clearly cite existing research and past literature and specify the sources. It should be noted that this point is extremely important in terms of research ethics. Thus, IRP final report should clearly deal with this. If it is found that the findings, figures and tables (papers, reports, websites, etc.) from existing literature are copied and pasted (plagiarism) without specifying or quoting the appropriate source, strict measures will be taken.
- d. Furthermore, it is not easy to exactly determine the format of IRP final report in order to reflect all requirements abovementioned. Considering the uniqueness of Department of Transdisciplinary Science and Engineering, it is further difficult to set the specific format. This guideline can be used as the format of research report to summarize on results of engineering as well as social sciences and humanities. Each individual needs to follow his or her academic advisor for detailed instructions.

2. Format of the Independent Research Project (IRP)

- a. The IRP should be submitted as a clean copy, typed or printed from a Microsoft Word (or similar platform determined by the academic advisor). Any word processing program is acceptable, as long as it is capable of conversion to pdf format.
- b. It should be printed on size A4 paper (297 mm x 210 mm). The text size should be 12 point, and the spacing between the lines set at 1.5" lines
- c. Set the margins to 20 mm on the top, 25 mm on the bottom (including the page number within this space), and 25 mm on the left and right sides.
- d. Figures, tables, etc., should be included and labeled properly as part of the file. Figures and tables should be clearly visible when printed on an A4 page size with readable labels and texts.
- e. There is no minimum required number of pages for the report. However, in general, the submitted IRP should be at least 25 pages including attachments and appendices.
- f. At a minimum, the IRP should include a title page, an abstract, a table of contents, the main texts, and a list of references. Page numbering starts from the main text of the report.

3. Format of the First Page -Title Page

- a. The English title should be centered on the page in bold print, 18 point
- b. Your affiliation (department) should be centered on the page, approximately 12 point.
- c. The date of submission (Month, Year) should be centered on the page, approximately 14 point.
- d. Your name should be centered on the page, 14 point. When writing your name in English, write your given name first (capitalizing the first letter only) and then your surname (all caps).
- e. Indicate the complete name of your research adviser, 14 point
(See a sample of title page in Appendix A)

4. Abstract – (Second Page)

A page that contains the abstract of your research follows the title page. These are the format and guidelines for the abstract page.

- a. Write “Abstract” on the first line, aligned center, in bold print, approximately 12 point.
- b. Summarize your report in about 400 words. This text should be approximately 12 point, 1.5” spaced.
- c. Your Abstract should answer these questions about your IRP:
 - a. What was done in your IRP? (Topic)
 - b. Why did you do it? (Significance)
 - c. How did you do it? (Methodology)
 - d. What did you find? (Results)
 - e. Why are these findings useful and important? (Analysis)

5. Table of Contents – (Third page)

Place the table of contents on the third page. The table of contents should include chapter titles, section titles, list of figures and list of tables, if any. Indicate the style of citation that is adapted to your report below the table of contents. Refer to the sample format in *Appendix B*.

6. List of Figures and List of Tables (Follows the Table of Contents)

After the table of contents, a separate page that lists that figures and the tables together the page where can they be found in your report is also necessary. Refer to the sample format in *Appendix C*.

7. Main contents of the report starting after the table of contents, list of figures and tables. (Note: this page should be indexed as Page 1 in the Table of Contents)

- a. Format: All text, including figures and tables, should be contained within the prescribed margins on size A4 paper.
- b. Page numbers: Center the page numbers on the bottom of the page.
- c. Suggested organization of the main part of the Independent Research Project
 - (1) The contents of IRP may vary depending on the nature of the research, but at least there should be an introduction (preface, foreword, preliminary remarks, literature review, etc.), research objectives, methodology, results and discussion, and conclusion (concluding remarks, future recommendations, etc.). After the last chapter of the report (conclusion), a formatted list of references (or bibliography) should be included, then followed by appendices and attachments, if any, in that order. Adding an acknowledgement section is also recommended.
 - (2) General format for the chapters: Chapter 1 is the Introduction, that contains the background of the study, etc, and the final chapter is the Conclusion. Each chapter should have a title and referred properly in the table of contents.
 - i. A new chapter will always start in a new page.
 - ii. Start the page with writing chapter number, bold, aligned center and then write the chapter title at the bottom of it.
 - iii. If there are sections on the chapter, each section is also given a title. Write the chapter number, a period, then the section number, and leave one blank space before writing the section title. Example: Section titles should have numbers such as 2.1. and 2.2.
 - iv. Sections may be further subdivided as needed. These subheadings should be numbered according to the system indicated above. Example: Subheading titles should have numbers such as 2.1.2 and 2.1.2.2.
 - v. The first line of each paragraph should be indented.

(3) Special Formats

- i. Mathematical equations: Use equation numbers for all equations and equations referred to within the text.
 - There should be an additional half-line spacing both above and below each formula to separate it from the main text.
 - Equations should be indented or aligned centered and be numbered
 - The equation number should be enclosed in parentheses, aligned with the right margin of the same line.

$$E = mc^2 \qquad \text{(Eq. 2.1)}$$

- The equations should be numbered in series by chapter, such as “(Eq. 2.1)”, for the first equation written in chapter 2.
 - If you wish to use a single equation number for multiple equations, add a lower-case letter immediately following the equation number, such as (Eq. 2.1a).
 - When referring to an equation within the text, it should be indicated by its number such as “Eq. (2.1)”
- ii. Figures
 - Figure or table should be aligned in the center, staying inside the page margins.
 - The number and title of a figure should be written below the figure. One blank space is left between the number and the title.
 - Figures are numbered in the same way as equations (e.g. Fig. 2.1, Fig. 2.3(b)).
 - The same denotations are used when referring to a figure within the text.
 - iii. Tables
 - Same as figures (e.g. Table 2.1).
 - The number and title of a table should be written above the table.
 - iv. Photographs
 - Same as figures (e.g. Fig. 3.1).

See examples in naming your figures and tables in *Appendix D* and *Appendix E*.

(4) References

You can use any referencing style (Chicago style, Oxford style, APA, etc., but make sure you only use one kind of style) **consistently** in your entire report.

- i. Inline citation: It is very important that you cite your reference properly in writing your IRP. You can use any referencing style but here are some guidelines on how to cite references in your IRP.
 - When citing a reference within the text, the author’s name and the year of publication should be stated.
 - If the author’s name is stated within the text, the year of publication is given in parentheses, e.g. “Wiegel and Miche (1966) discussed that...”. If the author’s name is not stated, both the author’s name and the year of publication should be given in parentheses. Multiple references are separated by semicolons, e.g. “...have presented some empirical results (Bunch et al., 1985; Beggs and Cardell, 1983).”
 - If there are three or more authors, the names of the second and subsequent authors can be omitted, e.g. “Smith et al.”

- ii. Formatted reference list (Bibliography): After the chapters, the list of reference should be also included in the IRP. You can use any referencing style but make sure you only use one kind of style (Chicago style, Oxford style, APA, etc.) **consistently** in your entire report.
- At the beginning of a new page, write the title “References”, and leave a line blank after it. References should be typed at 12pt., single spaced.
 - The first line of a reference is aligned with the left margin, and if it is more than one line long, the second and subsequent lines should be indented by two characters.
-
- Here is an example how to cite journal using Chicago style.
MacDonald, Susan Peck. “The Erasure of Language.” *College Composition and Communication* 58, no. 4 (2007): 585-625

Or an example of citing an electronic journal:

Bent, Henry E. "Professionalization of the Ph.D. Degree." *College Composition and Communication* 58, no. 4 (2007): 0-145. Accessed December 4, 2017. <http://www.jstor.org/stable/1978286>.

Here are some actual examples of author’s guidelines for academic journals.

Renewable & Sustainable Energy Review (Elsevier)

<https://www.elsevier.com/journals/renewable-and-sustainable-energy-reviews/1364-0321?generatepdf=true>

Social Indicators Research (Springer):

<https://www.springer.com/journal/11205/submission-guidelines#Instructions%20for%20Authors>

Journal of Chemical Engineering of Japan(Society of Chemical Engineers, Japan)

https://www.scej.org/jcej/JCEJ_instructions.html

<https://www.scej.org/jcej/manuscripts.html>

For additional guide on how you to write proper citation, you can also refer to the following sites:

APA style: <https://apastyle.apa.org/>

Chicago style: <https://www.chicagomanualofstyle.org/home.html>

Harvard style: <https://www.mendeley.com/guides/harvard-citation-guide>

- (5) Appendices. Appendices is the part in your IRP report where you put the materials that help you clarify your research but would be too much to be included in the main text. Some items that might be included in an appendix are:
- a. Survey questionnaires that you have created.
 - b. Tables, figures, schematic diagrams that do not belong to the main text.
 - c. Raw data from experiments.

Multiple attachments may be included. Follow the format for the chapters for the attachments or appendices.

8. Research integrity in Independent Research Project

Tokyo Tech undergraduate students are required to maintain high ethical standards in preparing their independent research project. The report should not contain materials plagiarized from other sources or falsified research data. It is not allowed to merely copy and paste from other sources. Submitted reports will be checked by your adviser for plagiarism using an appropriate software in Tokyo Tech.

Additionally, if the student intends to submit the results of the research to a journal or conference, it is necessary to ask permission from the research adviser first.

9. Academic writing consultation with Tokyo Institute of Technology Writing Center

If you need more help on how to write your independent research project that is acceptable in scientific or academic writing, you can consult with the Tokyo Tech Writing Center. In Tokyo Tech Writing Center, there will be a trained tutor that can help you improve your writing. Check their website for more details: http://www.fl.ila.titech.ac.jp/writing_center.html

10. Submission of Independent Research Project final report

Please follow the instructions of the way to submit your IRP report and its deadline, which will be announced by the department at the website (<http://www.tse.ens.titech.ac.jp/en/>). In general, all students are required to upload the report in pdf format to a designated cloud folder that will be set-up by the department before the deadline. The failure of the submission of IRP final report by the deadline will result to an unfavorable consequence to a student.

Appendix A: Sample of Title Page

All items to be centered

Independent Research Project

16pt

[Research Title]

18pt, Bold

Department of Transdisciplinary Science and Engineering
School of Environment and Society
Tokyo Institute of Technology

12pt

September 2021

14pt

Submitted By
Taro TOKIO

14pt

Research Supervisor
Prof. *****

14pt

Appendix B: Sample of Table of Contents

The Table of Contents should list all the items that you have included in your IRP, together with the page numbers where it can be found. A good example of a table of contents is given below:

Table of contents

Abstract	i
Acknowledgement	i
Table of contents	iii
List of figures	v
List of tables	vi
Acronyms	vii
Introduction	1
Chapter 1 Background of the study	2
1.1 Situation of agriculture in global scale	2
1.1.1 Situation of food production and agriculture	2
1.1.2 ICT adoption in agriculture.....	5
1.2 Situation of agriculture in Thailand	8
1.2.1 Overview	8
1.2.2 Thai farmers.....	10
1.2.3 Thai farms.....	12
1.2.4 Thai farming.....	14
1.2.5 Related policies.....	15
1.2.6 ICT adoption in Thai farmers.....	17

Sections and subsections per chapter should be identified and listed accordingly. At the end of the report, list of references and appendices (if any) should also be included.

Chapter 5 Discussion and conclusion	54
5.1 Discussion.....	54
5.1.1 Characteristics of Chanthaburi farmers	54
5.1.2 ICT adoption in Chanthaburi farmers	55
5.1.3 Socio-economic factors and ICT adoption in Chanthaburi farmers.....	56
5.2 Policy suggestion	56
5.3 Conclusion	57
5.4 Limitation and suggestion for further researches	58
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Appendix-C: Variables in the questionnaire.....	95
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Appendix-F: Check list for Research Ethic Education.....	117
Appendix-G: Presentation slides	120

Appendix C: Sample of List of Figures and List of Tables

After the table of contents, lists of figures and list of tables should also be included.

List of Figures

List of figures is table of contents of the figures that can be found in your IRP. This usually follows the table of contents; the format is given below.

List of figures

Figure 1-1 SDGs goal 2 Source UN, 2020	4
Figure 1-2 Examples of ICT	6
Figure 1-3 Thailand Sectoral Value-Added (% of GDP)	9
Figure 1-4 Thailand Sectoral Employment (% of Population)	9
Figure 1-5 Thai farmers' population pyramid	11
Figure 1-6 Education Status of Agricultural Labor	12
Figure 1-7 Variations of Farming Patterns	13
Figure 1-8 Internet access in Thailand (% of Population)	17
Figure 1-9 Website most visit by Thai internet users	18
Figure 1-10 Chanthaburi	20
Figure 1-11 Income per capita of Thai farmers	22
Figure 1-12 Debt to income of Thai farmers	22
Figure 2-1 Number of researches about ICT adoption in agriculture vs. internet penetration	24
Figure 2-2 Technology Adoption Model (TAM)	26
Figure 3-1 Example data plot for PCA (left) Example data plot for PCA with eigen vectors (right)	33
Figure 3-2 Dendrograms; source: by author	35
Figure 4-1 Chanthaburi farmers' gender 2013 and 2019	37
Figure 4-2 Population pyramid in 2003 and 2013 and 2019	37

List of Tables

List of tables is table of contents of the tables that can be found in your IRP.

List of tables

Table 1-1 Examples of ICT usage in agriculture	6
Table 1-2 Farm certification system	15
Table 3-1 Questionnaire's attributes	31
Table 4-1 List of post-harvest activities	44
Table 4-2 Farmers' attitude.....	45
Table 4-3 Average ICT usage score by cluster	49
Table 4-4 Cluster analysis and PC score	51

Note : For Microsoft Word users, MS Word has a function for creating a table of contents and list of figures and tables. It is a useful feature, and we recommend that you check it out. See the following page by Microsoft "Create a table of contents"



"Insert a table of figures".

Appendix D: Naming Figures in IRP

How to name figures in your IRP report (The figures and styles are just examples)

Although not shown below, do not forget to specify the legend of the figure and the units of the axes. Also, consider significant figures appropriately, depending on the situation

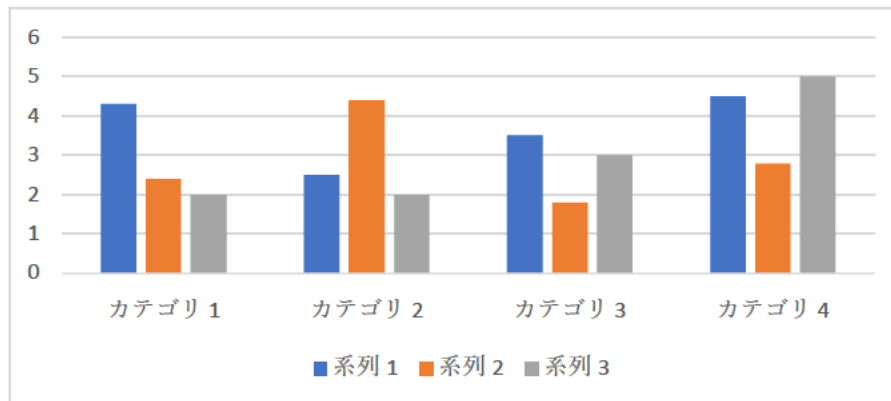


Figure 1.1 Comparison of results from Experiment 1.
(Source: by the author)

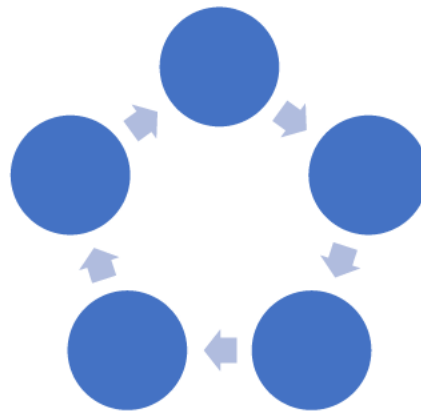


Figure 2.2 Implementation procedure in this study

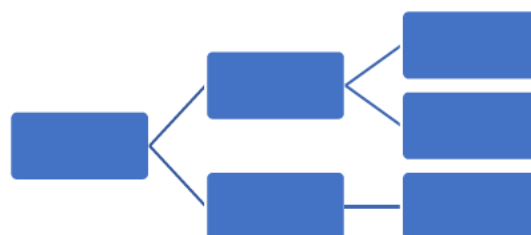


Figure 3.3 Classification of XX

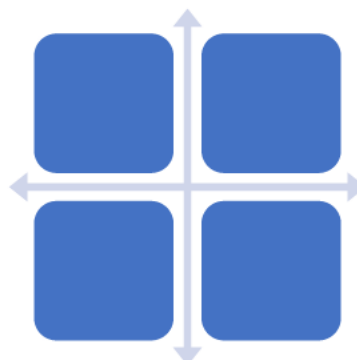


Figure 4.4 Typology analysis

Appendix E: Naming Tables in IRP

Example on how to name tables in your IRP report (The tables are just examples)

Here are some examples of how you should name your tables in your IRP. In the table entries, do not forget to specify the units or proper description of the items. Also, consider the number of significant figures used in values in the table.

Table 1. Overview of subject groups

Group name	Average income (yen)	Average age (years)	Gender ratio	Remarks

Table 1.1 Summary of countries analyzed

Country name	Average income (million yen))	Land area (km2)	Population size (# of people)	Remarks

(Source: by reference, or the author)

Table 2. List of basic statistics

	Ozone	Solar.R	Wind	Temp
Min.	1	7	1.7	56
1st Qu.	18	115.8	7.4	72
Median	31.5	205	9.7	79
Mean	42.13	185.9	9.958	77.88
3rd Qu.	63.25	258.8	11.5	85
Max.	168	334	20.7	97
	NA's :37	NA's :7		

(Source: by the author)

Table 3. Results of the regression analysis

Variable	Coefficient	t-value	P-value
Intercept			
X1			
X2			