

Analytic Case Studies in R

Project Final Report

By

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FALL, 2020

A paper submitted in partial fulfillment of the requirements for the degree of

Master of Science in Management and Systems

at the

Division of Programs in Business

School of Professional Studies

New York University

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Declaration

I, Andy Sheng, declare that this project report submitted by me to School of Professional Studies, New York University in partial fulfillment of the requirement for the award of the degree of Master of Science in Management and Systems is a record of project work carried out by me under the guidance of Dr. Andres Fortino, NYU Clinical Assistant Professor of Management and Systems. I grant powers of discretion to the Division of Programs in Business, School of Professional Studies, and New York University to allow this report to be copied in part or in full without further reference to me. The permission covers only copies made for study purposes or for inclusion in Division of Programs in Business, School of Professional Studies, and New York University research publications, subject to normal conditions of acknowledgment. I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

Acknowledgements

I sincerely thank Dr. Andres Fortino for his contribution as sponsor of this project and as mentor during this project. I also want to thank all the instructors in the Management and Systems program who I have taken courses with and learned a great deal.

Abstract

The purpose of this project study is developing an analytics case study book using R for NYU MASY program. This project study converts exiting analytics cases which using Excel into R language using commander and direct coding when need so the future student and analytics can use it as a tool to do their work. In this project study, basic techniques like descriptive statistics, 5-point summary, and different charts are covered. Moreover, intermediate and advanced techniques like pareto analysis, timeseries forecast, and multivariate regression also are introduced. By learn outcome from this project, reader will be able to do different analytics work in different scenarios by using R and R commander.

List of Abbreviations and Definitions

R: A programming language and free software environment for statistical computing and graphics

R Commander: A GUI for the R programming language

Descriptive statistics: A summary statistic that quantitatively describes or summarizes features from a collection of information

Pareto analysis: A statistical technique in decision-making used for the selection of a limited number of tasks that produce significant overall effect

Timeseries forecast: A method that using autoregression, moving average to make prediction for future outcome.

Multivariate regression: A subdivision of statistics encompassing the simultaneous observation and analysis of more than one outcome variable.

Text Analysis: is the process of deriving high-quality information from text

Introduction

Background information

New York University (NYU) is a private research university based in New York City founded in 1831. NYU as the largest private university in the United States by enrollment, has lots of campuses and academic centers worldwide. NYU is organized into 25 schools such as Tandon school of Engineering at Brooklyn, Stern school of Business at Washington Square park, and School of Professional studies.

NYU Management and Systems (MASYS) which is located at 7 E 12th St, New York, NY 10003, US is a program that provides students with experiential learning opportunities to develop strong management and leadership skills and gain a comprehensive knowledge of current information technologies. NYU MASYS program provides lots of competitive courses and learning opportunities for students in different field of study. To help students learn more about data analytics skills, NYU MASYS has already developed a case study book for business data analysts based on Excel previously. Recently, the program is considering extend the book to cover the R language for students in this additional area.

Sponsor Information

Dr. Andres Fortino - NYU Clinical Assistant Professor of Management and Systems. He is currently chief learning officer of Autonomous Professional Development (APD) and is responsible for research and development of new educational initiatives. He has held numerous senior-level management and leadership positions in higher education, including: (1) College provost and dean of academic affairs, DeVry College of New York, (2) Associate provost, NYU Tandon School of Engineering; (3) Dean of the School of Management, Marist College, where he created a new Master's in Technology Management degree.

Problem Description/Opportunity

NYU MASY program provides lots of competitive courses and learning opportunities for students in different field of study. To help students who wish to work in the data analysis and data science industries. NYU MASY program previously developed a case study book for business data analysts based on Excel.

The Excel tool that the program introduces to students can handle most statistical analysis situations like trend analysis and various of testing procedures. However, for some type of analysis such as time series forecasting, text analysis or even for some easy procedures but with large dataset, Excel may not be able to deal with them. This has been the pain point of NYU MASY program and a potential development recently.

The program wishes to extend the book of case studies for Excel data analysts to switch using the R language to be used to educate its students in the R Language for the future use since R can handle all different statistical analysis cases with even large datasets. Based on a case study book developed and used for its non-credit courses business data analysis based on Excel and wish to extend the book to cover the R language. The book will be used to train students in this additional data analysis area. Detailed, the project desires to develop a 16-chapter case book of 100 cases to help its students pursuing data analyst jobs to learn to use the R language. Once developed, it will be made available as a resource in training seminars, non-credit classes, and courses at NYU as a more useful and competitive material for students.

Importance of the project

Data analytics refers to qualitative and quantitative techniques and processes that used to enhance productivity and business gain. In real world, data analytics technical is needed in most business to customer models. Companies collect data from their customers and generate business decisions based on information produced by data and improve its managerial operations and leverage organizations to the next level.

R as a statistical analysis tool that offers strong ability for data analyzing work. Students who understand and know how to use R may achieve higher position at workplace. This project can treat as first step that helps students to transfer from using Excel to R and prepare for the future study and work. This project delivery a tool that NYU MASY can use to help student understand and learn how to use different analytics techniques by real case studies. Successfully developing the tool can improve competitiveness of NYU MASY as well as students in working situation.

The project is important for several seasons. The first and most important is granting students who will use the deliverables deep understating of statistical procedures about different analysis functions. The project will contain at least three exercises within each chapter that users can play with and apply what they learn from the project. Secondly, as part of the best educational institution, NYU MASY program can provide more competitive courses and materials to students. Last but not least, this project can be part of the series course that the program provides in business analytics. In the future, the project can be extending as a full programing course using R and available to students.

Alternate Solutions Evaluated

There are several alternative solutions for NYU MASY program. Developing the case study book by using R and R Commander has been picked due to the efficiency and effectiveness after a carefully evaluation.

The first alternative solution would be using R combine with R Commander. By doing so, students can learn how to do the data analytics work without knowing too much R programming language. It is easy to teach and work with instructors and students.

Pros:

Free: students and users do not need to purchase any tools or services but still have access to all resources of the R environment.

Easy to use: there is no prerequires knowledge of complex programming languages

Support all different needs and advanced techniques

Cons:

Different interface needs to handle between R and R commander

Some of the techniques may need extra basic R programming language.

The next alternative solution was using R directly for all types of analytics situation. By choosing this solution, student can perform better analyses and deal more complex cases.

However, this solution requires deep understanding programming language in R which is not suitable for some students who do not have enough background in R.

Pros:

Free students and users do not need to purchase any tools or services but still have access to all resources of the R environment.

Support more needs and advanced techniques like pareto analysis and text analysis

Cons:

Require more background in R programming language for different packages like ggplot2, packcircles, and wordcloud.

Solution Evaluation Criteria

Business Function Evaluation Criteria

If the solution meets NYU MASY's objectives of providing a competitive course to future students in related fields.

If the solution meets NYU MASY's exception on quality.

If the solution meets NYU MASY's requirement on teaching materials.

Cost Related Evaluation Criteria

If the solution meets NYU MASY's requirement on cost.

If the solution contains any further cost on customer's side.

Selection Rational

The goal of the project and benefits have been well defined. The goal will be developing a handbook that NYU MASY can use as martial and tool in a series of courses and increase competitiveness of the program.

This project should be able to provide NYU MASY a competitive and easy solution which can be used and taught in class soon without much further support from the project team. The project also should be able to finish within required amount of time which is three months in total. The project should not exceed the cost under suggestion of the program which is zero in this case.

For the project, the tool that project team select should be easy for students and users to obtain and installed. All exercises should be able to use only selected tool as well as the solution manuals for every chapters.

Approach and Methodology

WBS, SWOT, and Five-Forces analysis might be used in the project and will use a waterfall approach. The whole project will include different subphases which include initiation, planning, execution, control and closeout:

Initiation: This is the start of the project, and the goal of this phase is to define the project at a broad level. The project team begin with the NYU MASY case. During this phase, project team evaluation the project and develop project charter and deliver it to project sponsor to sign it off.

Planning: While working on project charter, the project team also this planning phase. This phase is key to successful project management and focus on developing a roadmap the all team member will follow. During this phase, project manager needs to do the literature review, as well as work breakdown structure, risk management plan, project plan.

Execution: This phase performed to complete work of the project defined in the project management plan. There are lots of steps during the execution phase such like: develop team, assign resources, set up tracking system, status meetings, update project schedule, as well as modify project plans as needed.

Controlling: While working on this project, this process requires to track, review all progress and performance. Identifying all possible risks and make change by submitting change management plan.

Closeout: Those processes performed to formally complete or close of the project. Once the project is complete, the project team will need to prepare the final project report as an official completion of the project for the capstone courses.

WBS Code	Element Name	Definition
1	R Data Analysis Notebook	Project definition.
1.1	Initiation	The work to initiate the project.
1.1.1	Evaluation & Recommendations	Working group to evaluate solution sets and make recommendations.
1.1.2	Develop Project Charter	Project Manager to develop the Project Charter.
1.1.3	Deliverable: Submit Project Charter	Project Charter is delivered to the Project Sponsor.
1.1.4	Project Sponsor Reviews Project Charter	Project sponsor reviews the Project Charter.
1.1.5	Project Charter Signed/Approved	The Project Sponsor signs the Project Charter which authorizes the Project Manager to move to the Planning Process.
1.2	Planning	The work for the planning process for the project.
1.2.1	Literature Review	Create a literature review for the project.
1.2.2	Situational Analysis and Cost Benefit Analysis	Create situational and cost benefit analysis for the project
1.2.3	Work breakdown structure and schedule	Create a WBD chart
1.2.4	Risk management plan	Create risk management for the project
1.2.5	Submit Project Plan	Project Manager submits the project plan for approval.
1.2.6	Milestone: Project Plan Approval	The project plan is approved, and the Project Manager has permission to proceed to execute the project according to the project plan.
1.3	Execution	Work involved to execute the project.
1.3.1	Getting know with R	Start working with R and get familiar with R interface

1.3.2	Verify & Validate User Requirements	The original user requirements are reviewed by the project manager and team, then validated with the users/stakeholders. This is where additional clarification may be needed.
1.3.3	Working with chapters and cases	Start working on project chapters by chapters
1.3.4	Work with solution manual	Start working on solution for cases
1.3.5	User Training	Provide training session to whom will using the deliverable of the project
1.3.7	Go live	System goes live with all users.
1.4	Control	The work involved for the control process of the project.
1.4.1	Project Management	Overall project management for the project.
1.4.2	Project Status Meetings	Weekly team status meetings.
1.4.3	Risk Management	Risk management efforts as defined in the Risk Management Plan.
1.4.4	Update Project Management Plan	Project Manager updates the Project Management Plan as the project progresses.
1.5	Closeout	The work to close-out the project.
1.5.3	Update Files/Records	All files and records are updated to reflect the widget management system.
1.5.4	Adjust cases if need	Adjustment based on final feedback
1.5.5	Final report	Submit the final report to NYU

Project Objectives and Metrics

Goal of the project

The objective of the project is to develop a case study book that can help students and users wishing to learn more about data analytics skills. The material should be easy to understand and highly practical for all users with or without necessary background of R language as well as packages like r Commander. The project will contain exercises for each chapters and solution manuals in case users need in the future.

In detail, this project contains four main objectives and metrics as shown below:

- Object 1 – convert existing Excel exercises making up a 16-chapter book to the R analysis language. The whole book will be converting based on the exiting book and use exiting datasets. All chapter will be covered except getting permission from project sponsor.
 - Measurement: delivery the R analysis language exercises by end of the semester that satisfy the requirement from project sponsor.
- Object 2 - develop a 10-page tutorial to install and use the R and R Commander interface for data analysis in business. The tutorial will be part of the notebook and will be introduced to users step by step in windows operating system only.
 - Measurement: delivery the tutorial by end of the semester that satisfy the requirement from project sponsor.
- Object 3 – submit 100 R exercises to the client. All exercises from the exiting boon will be covered and will use the provided datasets. When there is a need to create or obtain new dataset, project team will need obtain permission from project sponsor before making any change to the dataset.

- Measurement: delivery the satisfied exercises by end of the semester that satisfy the requirement from project sponsor.
- Object 4 – finish tasks on-time with high quality. All deliverable will be submitted by Dec 1st, 2020. The deliverables will include the case analytics book, solution manuals to all chapters, figure list, and tutorial.
 - Measurement: absolutely no delay during the project assignments.

Risk Analysis

As one of the main parts of this project, risk management is needed. Project team can identify, evaluate, and prioritize the risks possible happens though project cycle. Within this project, risks can come from various dimensions including schedule, quality, or datasets. The project team first defines all possible risks like missing project on time, exceed project on budget, or could not finish project with high quality.

Once all possible risks had defined, the project team discuss the risk matrix based on all defined risks and assign probability of occurrence of each risk.

Expected: very high probability of occurrence, typically more than 80% probability.

Possible: possible to occur and the probability is somewhere between 30% to 80 %.

Very Unlikely: very low probability of occurrence, typically lower than 30% probability.

The project will also define the potential damage to the project as defined below.

High: occurrence of certain risk would have major impact on project in part or in full.

Moderate: occurrence of certain risk would have some impact on project in part or in full.

Slight: occurrence of certain risk would have minor impact on project in part or in full.

		RISK (exposure)		
		1.Slight	2. Moderate	3. High
Probability (of occurrence)	1. Very Unlikely	Not complete the project on budget		Not complete the project on time
	2. Possible			Not complete the project with high quality
	3. Expected			

Besides the risk matrix, another important step in the risk analysis and management the team had done was provide contingency plan for each risk incase any one of the risks occur, so the team know what to do.

Risk	Description	Probability (1-3)	Exposure (1-3)	Contingency Plan
A	Not complete the project on time	1	3	Including contingency time in schediles to handle likely delays
B	failiur to meet the requirement on quality	2	3	make improvement once receive feedbakc from customer between final project schedual and contingncy time in schedual

Issues Encountered

While working on the project, the team encountered some issues. All of the issues the team faced are minor issues which do not have major impact on project. All issues were solved immediately once indicated so that the project was able to finish on time with high quality. Here is all type of issues project team faced in the duration of the project.

The first issue the team faced was data missing. One of the data set the project were supposed to used is missing in the public website. In order to produce expected case study as the project required, project manager contact the project sponsor and discuss it. The solution to this issue generated by project team were either change to the new dataset or find the expected dataset in other way which may cause extra time to do so. Once the project sponsor received the report of the issue and suggestions from project manager, sponsor indicated the team to switch another available dataset and passed it to the team so the team can move forward on the project.

The second issue the team faced was difference between Excel and R. For some of the analysis techniques, the outcome formats or layouts are different than what provided. For example, in one of the chapters that needs to generate histogram for certain dataset and the final result is different compare to the sample result come from Excel. After report the issue to the project sponsor, the feedback collected from sponsor was that procedure is more important than format, which means as long as the outcome of the project can deliver the idea and procedure of such technique clearly, different format would be acceptable.

Project Chronology and Critique

The tasks and duration of the project are shown below:

Level	Task Name	Due By	Start Day	Duration
1	Evaluation & Recommendations	8/20	8/15	5
2	Develop Project Charter	10/12	10/19	5
3	Project Sponsor Reviews Project Charter	10/19	10/14	3
4	Literature Review	9/28	9/13	15
5	Situational Analysis and Cost Benefit Analysis	10/05	9/31	5
6	Work breakdown structure and schedule	10/05	9/31	5
7	Risk management plan	11/16	11/11	5
8	Milestone: Project Plan Approval	11/02	11/01	1
9	Getting know with R	09/01	8/26	5
10	Verify & Validate User Requirements	09/04	9/01	3
11	Working with chapters and cases	09/04	9/01	3
12	Work with solution manual	09/04	9/01	3
13	User Training	11/10	11/05	5
14	Project Management	10/26	10/23	3
15	Risk Management	11/16	11/13	3

16	Update Project Management Plan	11/02	10/30	3
17	Update Files/Records	11/23	11/22	1
18	Adjust cases if need	11/23	11/16	7
19	Final report	12/01	11/30	1

Lessons Learned

The whole project was able deliver as planed with expected quality and in time and this could not have been done without contribution and help from all team members and sponsor. During the whole project implementation, team members have learned more than what had expected at first related to project management and data analytics.

Project management lessons learned:

Always plan ahead of schedule in case of any changes need to be applied.

Always plan project based on requirements from customer/sponsor.

Analysis possible risks/opportunities before and during project lifecycle.

Prepare necessary contingency plan in case risks happens.

Analytical lessons learned:

Pareto Analysis

Text Analysis in structured and unstructured text

Procedures in Data Visualization

Conclusion and Summary

This project started with well prepared. All issues occurred during development of the project were handled as planned in the risk management plan. As results, the project team successfully convert the exiting Excel exercises to the R analysis language and deliver to project sponsor on time. For each single exercise, solution manual is provided as well. Tutorial on how to install and use the R commander tool has been integrated into the deliverable. Collect all figures and tables into a PowerPoint file and pass to project sponsor as needed. All in all, expected project was able to deliver to customer. The project has achieved its objectives. The project will provide the handbook as a resource in training seminars, non-credit classes, and courses at NYU. It provides a more useful and competitive material for client. All issues and lessons that the project team faced and solved are important experience that could be applied in the future.

Limitations, Recommendations and Scope for Future Work

Even this project was able to deliver as expected, there are still some limitations within this project and some of the limitations may be improved in the future similar projects in NYU MASY.

First of all, Since there is limit information on R language in this project, in the future improvement, the project team highly suggest to develop a corresponding tutorial/handbook that contains more detailed information about R. once the recommended handbook is successfully developed, students may achieve deeper understanding on R language and procedures that have been introduced this project. On the other hand, introducing more about R language can help future students and users to gain more knowledge and skills on programing language which is another step to improve competitiveness of students as well as NYU MASY program.

Secondly, this project uses R language only which limits the opportunities for students or analytics who wants or needs to use other software or language such as STATS, MATLAB, or python. So, the project team recommend that in the future, the program can start similar project but use different programs so that students may have more choices and choose the one they need or fit their future work.

Thirdly, due to the project time limits, there are only limits case studies for different analysis techniques and the project team consider this as another limitation of this project. Limits number of cases may not be able to show procedures well to the audiences. The project team suggest that in the future similar project to include more exercises so that students can work and play with.

Literature Survey

Data science has been applied to so many fields like business and government since years ago. The power of data depends on how strong data analysis and graphics tools are. In the article written by Ross Ihaka and Robert Gentleman, they discuss how they came up with the new statistical language R based on the previous languages, namely, S by Becker, Chambers, and Wilk and Scheme by Steel and Sussman. They further discussed what advantages the new language they designed can provide and what future development that others can make. Ihaka and Gentleman found that there were different strong points of each language and want to find out what would happen if they can combine these strong points which became the idea of the birth of the new statistical language (1996). Due to the reason that they wanted to express the computations that they need to carry out, they decided to choose the S syntax for the new language because S is a powerful means for data analysts to performance that. The Scheme, on the other hand, concentrates on providing a small but powerful set of capabilities that are easily extended. R of course has some problems or disadvantages like so many other computational languages. The first one is that everything the user works on must be stored internally which means everything will be get lost if R crashes. Moreover, the way the user can save portions of work from the R session is to save the entire memory image which leads to large storage.

The work that had been done by Ross and Robert provides a strong computational language for data analysis. Since that, lots of professional people work on using and developing this powerful statistical tool. For example, Sebastien, Julie, and Francois discussed one of the packages that work with multivariate analysis they designed and implemented called FactoMineR in their article. They designed the extension package because of the need for a convenient way to implement new methodologies on the multivariate approach analysis. They

explained and illustrated the main features of the R package on how to consider different structures on the data such as a partition on the variables, a partition on the individuals, and a hierarchy structure on the variables. They discussed the classic way to produce the multivariate data analyses and point out that the traditional way may be hard to consider different types of structure on the data. Also, the package they designed was built in another package which is called R commander because this package is user-friendly and allows users to make graphs and save results (2008). In this article, we can learn that the R language is powerful so that analysts are willing to use it and its also friendly to implemented so developers are willing to build packages that empower the strength of R.

The creative work that had been done by Sebastien, Julie, and Francois introduces to us one of the powerful packages in the R implementations which is R commander. R commander as a package of R was developed by John in 2005. The developer wanted to design an extension that is easy-to-use and extensible cross-platform graphical user interface (GUI) in R and also to render visible the relationship between choices made in the GUI. In John's design (2005), the interface of the package was designed simple and familiar to R so does the frames of the data sets in R commander. The author then introduced the package from importing data sets to basic analyzing data like creating numerical summaries and graphs to us. Like R, the R commander is also extendable.

The package R commander has been popular since John implemented it into R. In 2014, Natasha A. Karp provided us an introduction of R Commander as a user. In Natasha's paper, she briefly introduces what is R commander and what are the basic built-in functions. Moreover, Natasha (2014) provides examples to show how to apply statistical tests like comparing the mean, variance, and non-parametric tests within R commander as well as how to make better

graphs by directly coding. In this article, we can gain a deeper understanding of how R commander works by step-by-step examples.

In another article written by Jason Wilson, Jason discussed why is R commander so popular and what does it do for data analyses and so many other questions related to R commander. In Jason's paper, we gain the instruction about when and when not to use R commander and the advantages and disadvantages between R commander and other alternatives. Jason elaborated three cases to answer when to use R commander compare to alternatives Minitab or SPSS, namely, quick entry into R, occasional use of R, and beginning to learn R programming. This provides a strong reason why we should use R commander in our project. We are not only can teach students how to do data analyses but also students can learn basic R programming knowledge by using R commander. The reason why and when should not to use R commander, according to Jason (2012) was that R commander only has limited functions from R which means R commander can do most analyses work for analyst but it is not enough when the cases became too complicated.

Meanwhile, the developer of R commander kept working on developing R commander and introduced the R commander plugin.survival package to us in 2012. In his article released on Journal of Statistical Software, John (2012) describes the new package which augments the original package to provide a GUI to many of the facilities of the survival package for R. By using the new survival package, users can do survival analysis with the R commander which empower the strength of R commander. Also, reshaping data from wide to long-form is a new dialog provided by these packages that may be useful in future work.

There are lots of users who are using R and R commander to produce the work of data analyses. In the case study by Isis Bulte and Patrick Onghena, Isis and Patrick discussed another

R commander package single-case data analysis (SCDA) by introducing an experimental example. By covering three important steps in the analysis of single-case data, Isis and Patrick believed that the SCDA package can bring lots of advantages such like the presence of serial dependency in the data will not invalidate the result of a randomization test and the package is free from the assumption of random sampling. This gains us the idea and ability on how to use R commander and analyses single-case visual analysis, single-case randomization tests, and single-case meta-analysis.

Another case study that was developed by Takashi Yamashita and Rachel Caitlyn Crane in 2019 introduced to us how R commander influences students' statistics anxiety. They introduced R commander to a certain class to see the change between pre- and post-test of the student. Even the sample size was small which was 29, the result showed that one of the attitudinal domains significantly improved and they concluded that using the open-source software like R commander can increase the hands-on training in a social statistics course. They found that the inclusion of R Commander exercise in the course not only partially improved students' attitudes toward statistics but also made no negative impact on the students; attitudes during the semester (2019).

The R commander is not only useful in classes but also powerful in the business and other sectors like the government. In the paper written by Ian Westbrooke and Peter Ellis, they introduce how to use R and R commander in the workplace based on the experience from the New Zealand government sector. They mentioned that once an organization or team needs to increase statistical capacity, staff will need to change and to be open to learning and applying quantitative skills (2014). They found that training in the workplace needs to be customized and R commander can play a critical role within it.

Just in September 2020, the developer of R commander, John Fox, introduced the newest version to us which was released in August 2020. In his new article, John discussed all changes to the R commander. In this paper, we can learn the newest functions and default settings in the R commander such as the new “stringsAsFactors” setting and new ANOVA/ANCOVA Dialogs. This helps us gain a deep understanding of this helpful application and learn how to use it as well.

The existing researches around R and R commander introduce the development of the language, implementation, and extension of the language, and cases that using this application as well. Specifically examining the capability and extendibility of this computational language. Most of the research reviewed concluded that R and R commander is powerful in data analyses and creating graphs. This will support the reason why we introduce this software to students and how we will work with it.

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Appendices

Project Acceptance Document

New York University MS in Management and Systems Applied Project Project Sponsor Agreement

1. Goals of the Program

For Participating Organizations

- Begin relationship with New York University
- Receive help from highly trained NYU graduate student
- Provide internship opportunity for NYU graduate student
- Receive assistance at no cost

For NYU Graduate Students

- Manage and implement a meaningful project aligned with their professional and educational goals
- Hands-on experience interacting with a start-up or operational small business or organization
- Earn credit toward completion of graduate degree by conducting an unpaid Applied Project under the mentorship of an NYU-SCPS professor.

2. Project Sponsor and Student Responsibilities

- Student prepares project planning documents
- Sponsor reviews and approves student's project plan
- Student submits project plan to faculty supervisors for approval
- Student conducts project according to plan
- At predetermined milestones sponsor reviews and approves status reports submitted by student
- Status reports reviewed and evaluated by faculty supervisors to assure student effort and project meet course requirements
- Project sponsor and student participate in periodic project reviews with NYU
- At project completion project sponsor completes evaluation forms
- Student prepares final report

3. Project Selection Process

- Project Evaluation Committee reviews proposed projects
- Projects are:
 - Relevant to MS degree course content
 - Significant to the participating organization
 - Substantial in terms of duration and scope
 - Challenging to the student
 - Capable of being measured against predetermined goals

4. The MS in Management and Systems

Concentrations in:

- Strategy and Leadership
- Systems Management
- Database Technologies
- Enterprise Risk Management

Students Study Courses in:

- Business Management
- Marketing
- Information Technology
- Database Development
- Financial Management

- Project Management

Typical Participating Student Profile

- Students selected to participate in this program meet stringent criteria
- Have completed all coursework
- High achievers with highest level GPAs and strong academic credentials
- 2-10 years of business experience
- Highly motivated for success

5. Sponsor and Project Information

Type of Organization	<input type="checkbox"/> For Profit <input checked="" type="checkbox"/> Not for Profit				
Name of Organization	NYU MASY				
Address	7 E 12th St, New York, NY 10003, US				
City	New York	State	New York	Zip	10003
Project Sponsor	First Name	Andres	Last Name	Fortino	
Title	Doctor				
Phone	8452427614				
Email	Agf249@nyu.edu				
Web Site	www.linkedin.com/in/afortino/				
Type of Business	Education				

Student Name	Andy Sheng
Project Title	Project Manager

Description of Project	
<p>NYU MASY Program wishes to develop a book of case studies for Excel data analysts to switch using the R language to be used to educate its students in the R Language. Based on a case study book developed of and used for its non-credit courses business data analysis based on Excel and wish to extend the book to cover the R language. The book will be used to train students in this additional data analysis area. NYU MASY Program desires to develop a 16-chapter case book of 100 cases to help its students pursuing data analyst jobs to learn to use the R language. Once developed, it will be made available as a resource in training seminars, non-credit classes and courses at NYU.</p>	
Estimated Hours of Student Participation	130hrs

Anticipated Results
<p>Successfully convert existing Excel exercises making up a 16-chapter book to the R analysis language on time</p>

<p>Knowledge and expertise student will need to be able to complete the project</p> <p>Project Management Research Process & Methodology R programing language</p>

<p>Will the project sponsor be available for periodic meetings with NYU to review progress, address questions and concerns with the professor supervising the program? <i>This is a requirement for the program</i></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>The student and project sponsor meet on a weekly basis via zoom meeting and report work progress and questions by email.</p>	

6. Sponsor Agreement

Students are interns, not professional consultants. NYU is not responsible for the outcomes of projects undertaken by students. Work is on a best-efforts basis; no guarantees or warranties are expressed or implied. Organization is responsible for evaluating work presented, determining its value and whether to use it or not. Some projects may require on-going management or even re-work by the Organization after the student completes their Applied Project.

Please note that in order to post an unpaid position, the internship must encompass all 6 components below:

1. The internship, even though it includes actual operation of the facilities of the employer, is similar to training which would be given in an educational environment;
2. The internship experience is for the benefit of the intern;
3. The intern does not displace regular employees, but works under close supervision of existing staff;
4. The employer that provides the training derives no immediate advantage from the activities of the intern; and on occasion its operations may actually be impeded;
5. The intern is not necessarily entitled to a job at the conclusion of the internship; and
6. The employer and the intern understand that the intern is not entitled to wages for the time spent in the internship.

I have read and agree with the information shown in the Terms and Conditions for employers contained on the following web page(s): <http://www.nyu.edu/life/resources-and-services/career-development/employers/post-a-job/terms-and-conditions.html>

Please complete and sign this form in the space provided below and return to the course professor via the student who will upload the document to the course drop-box. For any questions, please email the professor: Prof. Israel Moskowitz im36@nyu.edu.

I agree to the all of the above

Participating Organization NYU School of Profesional Studies Date 10/11/20

By (signature): *Andres Fortino*
Project Sponsor

Printed Name: Dr. Andres Fortino

Title: Clinical Associate Professor of Management and Systems

7. Student Agreement

Students who are planning to conduct an unpaid Applied Project must read and agree to the "Important Considerations Before Accepting a Job or Internship" contained on the following web page(s): <http://www.nyu.edu/life/resources-and-services/career-development/find-a-job-or-internship/important-considerations-before-accepting-a-job-or-internship.html>.

Students do not register their Applied Project with the Wasserman Center.

I agree to the all of the above

Student Name (Print) Andy sheng Date Oct 9th, 2020

Signature: *sheng*

Sponsor's Project Acceptance Document

Sponsor's Project Acceptance Document

Project Name: Analytic Case Studies in R
Student Name: Andy Sheng
Sponsoring Organization: NNYU MASY

Project Sponsor Name and Title: Dr. Andres Fortino
Project Sponsor Contact Information (email and phone): agf249@nyuy.edu/8452427614

PROJECT PLAN

At project start, show the project goal; the project objectives and related metrics to be used to show successful project completion. Sponsor should sign to indicate agreement.

Project Goal: Develop a 16-chapter R case

Objective #1: Convert existing Excel exercises to the R analysis language

Objective #2: Develop a tutorial to install and use R Commander

Objective #3: Develop R exercises for each chapter

Objective #4: Deliver a completed manual with all working exercises in R ready to be used in teaching a class.

I agree with the above planned project goal, project objectives, and related metrics.

Andres Fortino

10/11/20

Project Sponsor Signature

Date:

PROJECT RESULTS

Planned Start Date: Planned End Date:
Actual Start Date: Actual End Date:

If actuals differ from planned dates, the revised dates (Actual) are accepted by the sponsor if initialed here: **Sponsor Initials**

Project Goal

Was the project goal achieved as planned? Yes No, Reason missed:

If NO, please explain why this is an acceptable deviation. **Sponsor Initials**

Project Objective #1: <as shown above in Plan section>

Did the student's project meet this objective with associated measures and metrics as established at project inception? **Objective#1** has or has not been met. **Sponsor Initials**

If not met please explain why this is or is not an acceptable deviation.

<Repeat for each objective established in the PLAN section, above.>

Sponsor's Overall Evaluation of student's performance: <expand, as necessary>

PROJECT ACCEPTANCE

Project was completed satisfactorily and is hereby accepted

Project was completed satisfactorily but did not meet all objectives, as shown above. The Project is, nevertheless, accepted.

Project Sponsor Signature

Date:

Student Signature

Date:

Project Charter

Project Manager: Andy Sheng

Sponsor: Dr. Andres Fortino

Prepared by: Andy Sheng

Name and Location of Client Organization:

NYU MASY

7 E 12th St, New York, NY 10003, US

Revision History

Revision date	Revised by	Approved by	Description of change

Project Goal

The goal of the project is developing a book of case studies for Excel data analysts to switch using the R language

Problem/Opportunity Definition

NYU MASY Program wishes to develop a book of case studies for Excel data analysts to switch using the R language to be used to educate its students in the R Language. Based on a case study book developed and used for its non-credit courses business data analysis based on Excel and wish to extend the book to cover the R language. The book will be used to train students in this additional data analysis area.

Proposed Project Description

NYU MASY Program desires to develop a 16-chapter case book of 100 cases to help its students pursuing data analyst jobs to learn to use the R language. Once developed, it will be made available as a resource in training seminars, non-credit classes, and courses at NYU.

Project Sponsor

- Name and Title: Dr. Andres Fortino
- Role within the organization: Clinical Assistant Professor at NYU MASY
- Role on the project: Dr. Andres Fortino will help me to understand the requirement of the project and provide necessary resources as the project need

Objectives:

Technical Objectives:

- Convert existing Excel exercises to the R analysis language

Timing objectives

- Complete the entire project before 12/01

Resource objectives:

- Utilized the required resources to finish the project on time

Budget objectives

-

Budget objectives:

	Planned	Actual
Salaries	0	
Construction	0	
Mover	0	

Total	\$ 0	
--------------	-------------	--

Scope objectives:

- Deliver a completed manual will all working exercises in R ready to be used in teaching a class

Project Selection & Ranking Criteria

Project benefit category:

- Compliance/Regulatory Efficiency/Cost reduction Revenue increase

Portfolio fit and interdependencies

- Similar courses across the program will be affected by this project

Project urgency

- High

Cost/Benefit Analysis

Tangible Benefits

Benefit:

- A completed manual will all working exercises in R ready to be used in teaching a class

Value & Probability:

- NA

Assumptions Driving Value:

- NA

Intangible Benefits

Benefit:

- enhance its teaching diversity in the industry

Value & Probability:

- NA

Assumptions Driving Value

- value-driven benefits

Cost Categories

Amount

Internal Labor hours

130 hours

External costs

Labor (consultants, contract labor)

NA

Equipment, hardware, or software

NA (Software needed is free)

List other costs such as travel & training

NA

Financial Return

- NA

Other Business Benefits

enhance the competitiveness of the program

Assumptions

1. The datasets provided by MASY are accurate

2. The requirements provided by MASY are accurate and reachable

Scope

■ Quality

- Attract students' attitudes toward courses

■ Time

- Submit the project by 12/01

Constraints

1. Some of the exercises are solved quickly and easier in Excel than the R

Risks and Mitigation Strategies

1. Risk: The project should be finished by end of Fall 2020. Limited short time may cause selected cases or datasets are not a perfect suit for the requirement
2. Strategy: assign chapters into every week in detail and follow up the works break down.

Communications Plan

1. Frequency

One per week

2. Method

Zoom meeting

3. Content

Status report; Milestone notification; Calling for assistance

Schedule Overview

Project Start Date: 09/01/2020

Estimated Project Completion Date: 12/01/2020

Major Milestones

Execution 09/01

Verify & Validate User Requirements 09/04

User Training 11/10

Go live 11/20

Final report 12/01

External Milestones Affecting the Project

NA

Impact of Late Delivery

Failure to deliver the project on time may cause MASYS cannot provide a corresponding course in the future

Resources Required

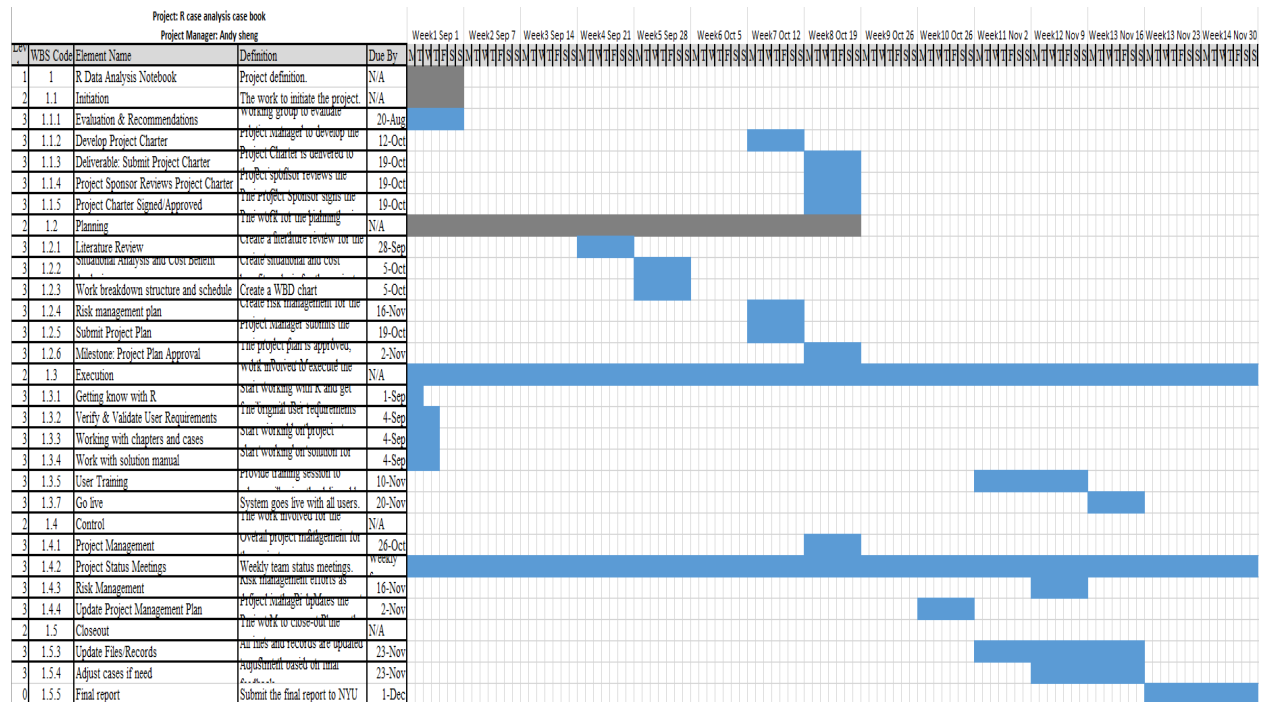
Role	Responsibilities	Duration of work	Qualifications needed
R Developer	developing the book of case study	13 weeks	R languages skill

Facilities, Software, Hardware, and Other Resources

Software: R/R Studio

Resources: Datasets

Procedures/ Methodology



Project Evaluation

1. Project schedule

Report project status every week to the project sponsor to make sure the project will be finished on time.

2. Project weekly status report and dashboard

Confirm the weekly project progress with the project manager and sponsor

3. Project communication plan, issues log, risk register

Follow the communication plan and meet with the project sponsor every week. Report issues faced during the project and discuss during a meeting

4. Project monthly status report

Create a comprehensive status report every month or major milestone. The report will focus on the progress and any change need during the project.

Project Plan

1. R Data Analysis Notebook

1.1 Initiation

1.1.1 Evaluation & Recommendations

1.1.2 Develop Project Charter

1.1.3 *Deliverable*: Submit Project Charter

1.1.4 Project Sponsor Reviews Project Charter

1.1.5 Project Charter Signed/Approved

1.2 Planning

1.2.1 Literature Review

1.2.2 Situational Analysis and Cost Benefit Analysis

1.2.3 Work Breakdown Structure and Schedule

1.2.4 Risk Management Plan

1.2.5 Submit Project Plan

1.2.6 *Milestone*: Project Plan Approval

1.3 Execution

1.3.1 Getting know with R

1.3.2 Verify & Validate User Requirements

1.3.3 Working with chapters

1.3.4 Working with solutions

1.3.5 Checking with sponsors

1.3.6 User Training

1.3.7 Submit final version

1.4 Control

1.4.1 Project Management

1.4.2 Project Status Meetings

1.4.3 Risk Management

1.4.4 Update Project Management Plan

1.5 Closeout

1.5.1 Update Files/Records

1.5.2 Adjust cases if need

1.5.3 Submit final report of the project

Work Breakdown Task Definition and Schedule

Level	WBS Code	Element Name	Definition	Due By
1	1	R Data Analysis Notebook	Project definition.	N/A
2	1.1	Initiation	The work to initiate the project.	N/A
3	1.1.1	Evaluation & Recommendations	Working group to evaluate solution sets and make recommendations.	8/20
3	1.1.2	Develop Project Charter	Project Manager to develop the Project Charter.	10/12
3	1.1.3	Deliverable: Submit Project Charter	Project Charter is delivered to the Project Sponsor.	10/19
3	1.1.4	Project Sponsor Reviews Project Charter	Project sponsor reviews the Project Charter.	10/19
3	1.1.5	Project Charter Signed/Approved	The Project Sponsor signs the Project Charter which authorizes the Project Manager to move to the Planning Process.	10/19
2	1.2	Planning	The work for the planning process for the project.	N/A

3	1.2.1	Literature Review	Create a literature review for the project.	9/28
3	1.2.2	Situational Analysis and Cost Benefit Analysis	Create situational and cost benefit analysis for the project	10/05
3	1.2.3	Work breakdown structure and schedule	Create a WBD chart	10/05
3	1.2.4	Risk management plan	Create risk management for the project	11/16
3	1.2.5	Submit Project Plan	Project Manager submits the project plan for approval.	10/19
3	1.2.6	Milestone: Project Plan Approval	The project plan is approved, and the Project Manager has permission to proceed to execute the project according to the project plan.	11/02
2	1.3	Execution	Work involved to execute the project.	N/A
3	1.3.1	Getting know with R	Start working with R and get familiar with R interface	09/01

3	1.3.2	Verify & Validate User Requirements	The original user requirements are reviewed by the project manager and team, then validated with the users/stakeholders. This is where additional clarification may be needed.	09/04
3	1.3.3	Working with chapters and cases	Start working on project chapters by chapters	09/04
3	1.3.4	Work with solution manual	Start working on solution for cases	09/04
3	1.3.5	User Training	Provide training session to whom will using the deliverable of the project	11/10
3	1.3.7	Go live	System goes live with all users.	11/20
2	1.4	Control	The work involved for the control process of the project.	N/A
3	1.4.1	Project Management	Overall project management for the project.	10/26
3	1.4.2	Project Status Meetings	Weekly team status meetings.	Weekly from 09/24

3	1.4.3	Risk Management	Risk management efforts as defined in the Risk Management Plan.	11/16
3	1.4.4	Update Project Management Plan	Project Manager updates the Project Management Plan as the project progresses.	11/02
2	1.5	Closeout	The work to close-out the project.	N/A
3	1.5.3	Update Files/Records	All files and records are updated to reflect the widget management system.	11/23
3	1.5.4	Adjust cases if need	Adjustment based on final feedback	11/23
3	1.5.5	Final report	Submit the final report to NYU	12/01

Situational Analysis

Industry Analysis

The educational industry has been growing and changing for a long time. As we can see nowadays, the traditional way of teaching and learning is no longer been satisfied by students or who are seeking a place to learn concepts. Also, the success matrix of education will be measured by the mastery of key concepts rather than passing standardized exams. On the other hand, technology has been integrated into every sector of the education industry (Immanuel). To be successful in the educational industry, one of the important keys will be flexible, not only in concepts but also in the model. NYU MASY provided a course that teaches students how to do data analysis by using Excel which is popular in the basic analysis, however, when dealing with a large dataset or creative analysis, Excel may not work well. Providing another similar course that using R to do data analysis will be the best move for MASY to follow the industry trend and need.

Competitors

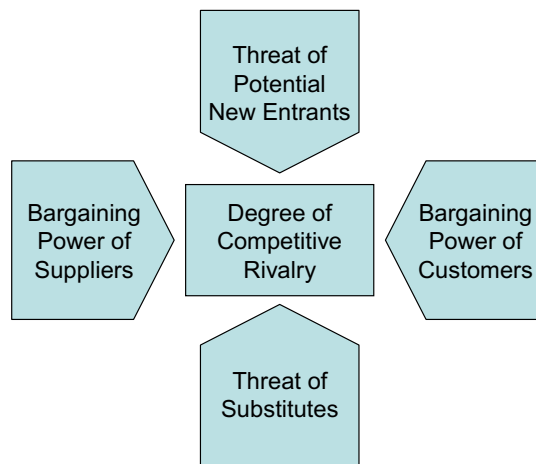
Since the location of educational institutions also provides part of competitive advantage, other educational institutions located close to NYU MASY will be considered as main competitors. For example, those institutions in NYC like Columbus University, Pace University, and the State University of New York. On the other hand, the rise of online academies became one of the trends in the educational industry which create another group of competitors for MASY. For example, Edx, Courser, and LinkedIn Learning. The local competitors will be the main competitors since they have almost the same local resources and other advantages by locating in NYC. Right now, most of the local competitors have provided online courses or hybrid as a response to the industry trend and threat from online competitors. Also, all

competitors provided courses based on the need of working environments like data analysis, machine learning, and artificial intelligence.

Stakeholders

In our project, the stakeholder refers to administrators, teachers, staff members, students, parents, community members, and elected officials such as school board members (Great Schools Partnership). As one of the greatest universities in the world, NYU has great instructors and students. Students want to learn as much and deep as they can and that should be one of the goals of our project. So, in our project, we should provide as many details as we can to satisfy the requirements of students.

Porter's Five-Forces Analysis



Porter's Five-Forces Model

The threat of Potential New Entrants

As the market is getting changed, more and more employers provide training and receiving certificates for their employees. This causes some certificate provider to join the educational industry especially for those who provide certificates as market need.

Threat of substitutes

More and more schools and institutions provide short-term programs, online courses, and summer courses. All of these competitive options are considered as substitutes of the traditional and local educational institutions.

Bargaining power of customers

Price is always one of the important factors when students select institutions. When two institutions provide similar services, the price will be the reason that affects students' choice.

Bargaining power of suppliers

Instructors and professors are considered "supply" in the educational industry. To increase the power of suppliers, increase the salary of instructors so that school can have more good instructors and professors

Competitive rivalry

The increasing rate of institutions is higher than the increasing rate of the number of students. That means more schools or programs are competing for fewer students (Tempo).

Project Change Management Plan

Project Name:	Analytic Case Studies in R
Prepared by:	Andy Sheng
Date (MM/DD/YYYY):	11/02/2020

1. Purpose

<ul style="list-style-type: none"> • Ensure that all changes to the project are reviewed and approved in advance • All changes are coordinated across the entire project. • All stakeholders are notified of approved changes to the project. 	
<i>All project Change Requests (CR) must be submitted in written form using the Change Request Form provided.</i>	
<i>The project team should keep a log of all Change Requests.</i>	

2. Goals

<i>The goals of this Change Management Plan are to:</i>	
<ul style="list-style-type: none"> • Give due consideration to all requests for change • Identify define, evaluate, approve, and track changes through to completion • Modify Project Plans to reflect the impact of the changes requested • Bring the appropriate parties (depending on the nature of the requested change) into the discussion • Negotiate changes and communicate them to all affected parties. 	

2. Responsibilities

<i>Those responsible for Change Management</i>	<i>Their Responsibilities</i>
<ul style="list-style-type: none"> • Project Manager (with the Project Team) 	Developing the Change Management Plan
<ul style="list-style-type: none"> • Project Manager 	Facilitating or executing the change management process. This process may result in changes to the scope, schedule, budget, and/or quality plans. Additional resources may be required.
<ul style="list-style-type: none"> • A designated member of the Project Team 	Maintaining a log of all CRs
<ul style="list-style-type: none"> • Project Manager 	Conducting reviews of all change management activities with senior management on a periodic basis
<ul style="list-style-type: none"> • The Executive Committee 	<p>Ensuring that adequate resources and funding are available to support execution of the <i>Change Management Plan</i></p> <p>Ensuring that the <i>Change Management Plan</i> is implemented</p>

5. Process

5. Process

The Change Management process occurs in six steps:

1. Submit written Change Request (CR)
2. Review CRs and approve or reject for further analysis
3. If approved, perform analysis and develop a recommendation
4. Accept or reject the recommendation
5. If accepted, update project documents and re-plan
6. Notify all stakeholders of the change.

In practice the Change Request process is a bit more complex. The following describes the change control process in detail:

1. **Any stakeholder can request or identify a change. He/she uses a *Change Request Form* to document the nature of the change request.**
2. **The completed form is sent to a designated member of the Project Team who enters the CR into the *Project Change Request Log*.**
3. **CRs are reviewed daily by the Project Manager or designee and assigned one four possible outcomes:**
 - *Reject:*
 - Notice is sent to the submitter
 - Submitter may appeal (which sends the matter to the Project Team)
 - Project Team reviews the CR at its next meeting.
 - *Defer to a date:*
 - Project Team is scheduled to consider the CR on a given date
 - Notice is sent to the submitter
 - Submitter may appeal (which sends the matter to the Project Team)
 - Project Team reviews the CR at their meeting.

5. Process

- *Accept for analysis immediately (e.g., emergency):*
 - An analyst is assigned and impact analysis begins
 - Project Team is notified.
- *Accept for consideration by the project team:*
 - Project Team reviews the CR at its next meeting.

4. All new pending CRs are reviewed at the Project Team meeting. Possible outcomes:

- *Reject:*
 - Notice is sent to the submitter
 - Submitter may appeal (which sends the matter to the Project Sponsor, and possibly to the Executive Committee)
 - Executive Committee review is final.
- *Defer to a date:*
 - Project Team is scheduled to consider the CR on a given date
 - Notice is sent to the submitter.
- *Accept for analysis:*
 - An analyst is assigned and impact analysis begins
 - Notice is sent to the submitter.

5. Once the analysis is complete, the Project Team reviews the results.¹ Possible outcomes:

- *Reject:*
 - Notice is sent to the submitter
 - Submitter may appeal which sends the matter to the Project Sponsor (and possibly to the Executive Committee)
 - Executive Committee review is final.

¹ Note: Sponsor participates in this review if the analysis was done at Sponsor's request.

5. Process

- *Accept:*
 - Project Team accepts the analyst's recommendation
 - Notice is sent to Project Sponsor as follows:
 - Low-impact CR – Information only, no action required
 - Medium-impact CR – Sponsor review requested; no other action required
 - High-impact CR – Sponsor approval required.
- *Return for further analysis:* Project Team has questions or suggestions that are sent back to the analyst for further consideration.

6. Accepted CRs are forwarded to the Project Sponsor for review of recommendations. Possible outcomes:

- *Reject:*
 - Notice is sent to the submitter
 - Submitter may appeal to the Executive Committee
 - Executive Committee review is final.
- *Accept:*
 - Notice is sent to the submitter
 - Project Team updates relevant project documents
 - Project Team re-plans
 - Project Team acts on the new plan.
- *Return for further analysis:*
 - The Sponsor has questions or suggestions that are sent back to the analyst for further consideration
 - Notice is sent to the submitter
 - Analyst's recommendations are reviewed by Project Team (return to *Step 5*).

6. Notes on the Change Control Process

1. A Change Request is:

6. Notes on the Change Control Process

- Included in the project only when both Sponsor and Project Team agree on a recommended action.

2. The CR may be:

- *Low-impact* – Has no material affect on cost or schedule. Quality is not impaired.
- *Medium-impact* – Moderate impact on cost or schedule, or no impact on cost or schedule but quality is impaired. If impact is negative, Sponsor review and approval is required
- *High-impact* – Significant impact on cost, schedule or quality. If impact is negative, Executive Committee review and approval is required

3. For this project:

- *Moderate-impact* – Fewer than 7 days change in schedule; no change in budget; one or more major use cases materially degraded
- *High-impact* – More than 14 days change in schedule; no change in budget; one or more major use cases lost.

4. All project changes will require some degree of update to project documents:

- *Low-impact* – Changes likely require update only to requirements and specifications documents
- *Moderate- or high-impact* – depending on the type of change, the following documents (at a minimum) must be reviewed and may require update:

<i>Type of Change:</i>	<i>Documents to Review (and update as needed):</i>
------------------------	--

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Scope | <ul style="list-style-type: none"> ▪ Scope Statement and WBS ▪ Budget ▪ Project Schedule ▪ Resource Plan ▪ Risk Response Plan ▪ Requirements ▪ Specifications |
|---|--|

6. Notes on the Change Control Process

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Schedule | <ul style="list-style-type: none"> ▪ Project Schedule ▪ Budget ▪ Resource Plan ▪ Risk Response Plan |
| <ul style="list-style-type: none"> ▪ Budget | <ul style="list-style-type: none"> ▪ Budget ▪ Project Schedule ▪ Resource Plan ▪ Risk Response Plan |
| <ul style="list-style-type: none"> ▪ Quality | <ul style="list-style-type: none"> ▪ Budget ▪ Project Schedule ▪ Resource Plan ▪ Risk Response Plan ▪ Quality Plan ▪ Requirements ▪ Specifications |

5. Project documents:

Whenever changes are made to project documents, the version history is updated in the document and prior versions are maintained in an archive. Edit access to project documents is limited to the Project Manager and designated individuals on the Project Team.

- For this project, all electronic documents are kept in:

Version Control System:

Central storage available to the Project Team:

The electronic project documents, including project proposal, project plan, research paper, and other documents, are supposed to maintained uniformly by the project team

Other:

6. Notes on the Change Control Process

- For this project, all paper documents are kept:

Project file maintained by the Project Manager:

Other: There is no paper documents in this project

- The following individuals have edit access to project documents:

<i>Role</i>	<i>Documents</i>
<ul style="list-style-type: none"> ▪ Project Manager ▪ ▪ ▪ ▪ 	<ul style="list-style-type: none"> ▪ All current documents ▪ Project archive ▪ ▪ ▪

Project Change Management Plan / Signatures

Project Name:	Analytic Case Studies in R		
Project Manager:	Andy Sheng		
<i>I have reviewed the information contained in this Project Change Management Plan and agree:</i>			
Name	Role	Signature	Date (MM/DD/YYYY)
Andy sheng	Project management	AS	11/02/2020

Project Risk Analysis Plan

Project

Project: Analytic Case Studies in R

Goal and description: The goal of the project is developing a book of case studies for Excel data analysts to switch using the R language. Once developed, it will be made available as a resource in training seminars, non-credit classes, and courses at NYU.

Risks

Number	Risk	Probability Score (1,2 or 3)	Impact Score (1,2 or 3)	Total= Prob x Impact
1	Not complete the project on time	1	3	3
2	Not complete the project on budget	1	1	1
3	Not complete the project with high quality	2	3	6
4				

Risk Matrix

		RISK (exposure)		
		1.Slight	2. Moderate	3. High
Probability (of occurrence)	1. Very Unlikely	Not complete the project on budget		Not complete the project on time
	2. Possible			Not complete the project with high quality
	3. Expected			

Contingency Plan

Risk	Description	Probability (1-3)	Exposure (1-3)	Contingency Plan
A	Not complete the project on time	1	3	Including contingency time in schedules to handle likely delays
B	failiur to meet the requirement on quality	2	3	make improvement once receive feedback from customer between final project schedual and contingency time in schedual

Project Status Reports

Project Status Report

Analytic Case Studies in R Status Report <November 2020>

To: Prof Andres Fortino *AGF* 11/2/20
From: Andy Sheng
Date: 11/02/2020

YOUR ANTICIPATED COMPLETION DATE: 12/01/2020
COMPLETION SEMESTER: FALL 2020

Project Status Areas:	Execution Week		
	Green	Yellow	Red
1. Overall Project Status	Green		
2. Project Schedule			
3. Project Deliverables			
4. Issues	Green		
5. Project Risks	Green		
6. Resources & Collaboration	Green		
7. Change Status	Green		

1 – Overall Project Status	
Status – Overall	
<ul style="list-style-type: none"> • Execution Week 8 we focused on the last two chapters of the project and will be finished on time. • The whole group worked well. • Minor change has been approved. 	

2 – Project Schedule	
Tasks that are not on schedule per workplan	Impact
1. NA	1. NA

3 – Project Deliverables
COMPLETED DELIVERABLES: NA
UPCOMING DELIVERABLES: Case study and solution manual

4 – Issues
NA

5 – Project Risks	
Potential Risks	Possible Mitigation
Could not finish project on time	Finish all step one week ahead so I have extra time to work and make change on project.

6- Resources and Collaboration
• NA

7 - Change Status	
Scope Changes	Status (Requested Approved Completed)
Need to collect new datasets outside of the database for AB testing analysis	Approved

Comments/Actions
Project goes well and will keep push it.

8 - Sponsor Signoff	
Sponsor indicates agreement with the above status report.	

Assessment Guidelines

The assessment is designated by one of the three "Traffic Light" colors utilizing the following guidelines:
Each project should establish the appropriate project slippage metrics for yellow vs red status

Executive Summary:	Assessment		
	Green	Yellow	Red
Overall Project and Most status areas	No major issues, minimal risk to project, on target with expected outcomes, project on schedule, everyone satisfied with progress.	Some major issues, moderate risk to project, must monitor closely, some internal or/and external dissatisfaction with progress. Project plan slipping by 2+ days.	Significant issues, serious risks to project, significant intervention must occur to achieve success, potential for stoppage of project activity. Project slipping by 5+ days, and resources uncommitted to meet deliverables.

1 – Overall Project Status	
Status – Overall	
<ul style="list-style-type: none"> • Execution Week 10 we focused on the formatting and last 3 case exercises will be finished on time. • The whole group worked well. • Minor change need to be approved. 	

2 – Project Schedule	
Tasks that are not on schedule per workplan	Impact
1. NA	1. NA

3 – Project Deliverables
COMPLETED DELIVERABLES: Case study draft 1
UPCOMING DELIVERABLES: Final Draft, solution manual, and all figures in PowerPoint

4 – Issues
NA

5 – Project Risks	
Potential Risks	Possible Mitigation
NA	NA

6 – Resources and Collaboration	
<ul style="list-style-type: none"> • NA 	

7 – Change Status	
Scope Changes	Status (Requested Approved Completed)
Need to collect new datasets outside of the database for Case 12.3	Requested

Comments/Actions
Project goes well and will keep push it.

8 – Sponsor Signoff		
Sponsor indicates agreement with the above status report.		
Andres Fortino, PhD	11/21/20	<i>Andres Fortino</i>

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