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## Understanding the impact of Academic Climate on STEM dissertator's interest in faculty careers using data management and visualization techniques

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# **Understanding the impact of Academic Climate on STEM dissertator's interest in faculty careers using data management and visualization techniques**

*by*

**Bhavana Chadive**

A creative component report submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of  
Master of Science

Major: Information Systems

Program of Study Committee:  
Dr. Sree Nilakanta, Major Professor  
Dr. Kevin Scheibe

The student author, whose presentation was approved by the program of study committee, is solely responsible for the content of this report. The Graduate College will ensure this report is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

Ames, Iowa

2018

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## TABLE OF CONTENTS

Page	
LIST OF FIGURES .....	iv
ACKNOWLEDGMENTS .....	v
ABSTRACT.....	vi
CHAPTER 1. INTRODUCTION .....	7
About CIRT.....	7
Divisions of the Grant.....	7
Research Question .....	8
Aim of the project.....	8
Methodology.....	9
Audience of Research.....	9
Stakeholders.....	10
Discussion.....	10
CHAPTER 2. LITERATURE REVIEW .....	11
CHAPTER 3. RESEARCH DESIGN.....	13
Survey Creation .....	13
Process Planning.....	13
Survey Deployment .....	16
Establishing a Remote Server and Creating a Data Warehouse .....	16
Importing to Database .....	17
Visualization Techniques .....	17
CHAPTER 4. PROJECT TIMELINE.....	18
CHAPTER 5. DATA DICTIONARY AND UNDERSTANDING .....	19
Creation of Database .....	20
Change Log Management.....	21
Data Gathering and Cleansing .....	23
CHAPTER 6. DATA VISUALISATIONS .....	24
CHAPTER 7. CHALLENGES .....	31
Changes in the process workflow .....	31
Database design changes.....	31
Changes in data visualizations.....	32

CHAPTER 7. CONCLUSION AND FUTURE RESEARCH .....	33
APPENDIX.....	35
Survey Results of Workshop – Graduate Student .....	36
Survey Results of Annual Survey – Graduate Student.....	38
SRS requirements – Snapshot of Table of Contents.....	39
Comparison between Tableau Desktop and Tableau Online.....	40

## LIST OF FIGURES

### Page

Figure 1: Process Workflow for Workshop Survey.....	14
Figure 2: Process Workflow for Annual Survey.....	15
Figure 3: Data Model for Workshop Surveys.....	16
Figure 4: Data Model for Annual Surveys.....	17
Figure 5: Gnat Chart displaying project timeline.....	18
Figure 6: Data model that was created in MySQL for Workshop Surveys.....	20
Figure 7: Screenshot of the Changelog Document.....	21
Figure 8: Database design Version v1.....	22
Figure 9: Database Design Latest Version.....	22
Figure 10: Results from Annual Survey.....	25
Figure 11: Results from Workshop Survey.....	25
Figure 12: Report from the Student Annual Surveys showing overall climate.....	26
Figure 13: Report from the Student Annual Surveys showing negative experience and witness bias analysis.....	27
Figure 14: Report from the Student Annual Surveys showing attitude & behavior analysis.....	28
Figure 15: Report from the Faculty Annual Surveys showing rapport analysis.....	28
Figure 16: Report from the Faculty Annual Surveys showing career encouragement Analysis.....	29
Figure 17: Report from the Faculty Workshop Surveys showing level of agreement analysis.....	29
Figure 18: Report from the Postdoc Workshop Surveys showing workshop feedback analysis.....	30

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In addition, I would also like to thank my friends, colleagues, the department faculty and staff for making my time at Iowa State University a wonderful experience.

## ABSTRACT

The Center for the Integration of Research, Teaching, and Learning (CIRTL) was formed to analyze the overall experiences of STEM Dissertators and Faculty and understand the relationship of their academic experiences with their interest in faculty careers. My involvement in this project was in developing process and data management workflows and also in providing a platform to understand the results through visualizations.

The participants include graduate students, faculty members and Postdocs from ten distinguished universities. Surveys are filled in by the participants which are then analyzed to understand behavior patterns. This whole workflow where data is transferred between universities was created so the process can happen effectively. Once the process is mapped, work involved data gathering from the universities and warehouse creation to store the data for several years to follow. Eventually a dashboard was created to understand participant results and observe any trends.

This report limits to observing the patterns between the universities as the survey was deployed only once until now. The project plans to observe the patterns in participants across ten universities and help the participating universities in understanding the factors which cause them to change their opinions about having a career in the teaching domain. Further, this project aims to integrate the results among all the universities onto a Tableau dashboard to provide visualizations that help in understanding which universities perform well and share their learnings.

## CHAPTER 1 - INTRODUCTION

### About CIRTL

CIRTL is an organization that aims to enhance excellence in STEM undergraduate education through evidence-based teaching practices for diverse learners. CIRTL was founded in 2003 as a National Science Foundation Center for Learning and Teaching in higher education. CIRTL uses graduate educations and grants to help improve student life within the campus and also understand the effect that the university climate has on taking up teaching as a profession. The goal of CIRTL is to improve the STEM learning of all students at every college and university and thereby increase the literacy of the country.

CIRTL-AGEP network is affiliated with universities such as Iowa State University, Boston University, Cornell University, Howard University, Michigan State University, Northwestern University, University of Buffalo, University of Georgia, University of Maryland College Park, and University of Texas at Arlington.

As mentioned earlier, the grant focuses on improving dissertator experiences at a variety of institutions with the goal of reducing the effect of negative climate on interest in faculty careers.

### DIVISIONS OF THE GRANT

1. **Annual Survey** – Each university sends out an annual survey regarding academic climate. The surveys were developed here at Iowa State University with Dr. Craig Ogilvie, Dean of the Graduate College heading the planning committee. The response rate of these surveys is expected around 30 percent. Separate Surveys for students and Faculty were created.



2. **Annual Workshop Survey** – Each STEM department of the ten universities takes part in a 3 hour workshop which educates the students about sensitive topics like Biases, Gender Discrimination and Micro-aggressions. There are three kinds of workshops - one for each of the students, Postdocs and Faculty groups.

## **RESEARCH QUESTION OF THE CIRTL GRANT**

Research question will address:

- 1) Student's interest and engagement level with their departments and disciplines
- 2) Which experiences and relationships are most influential in strengthening students' interest in faculty careers?
- 3) How peers and external supports influence the sense of community for dissertators

## **AIM OF THE PROJECT**

The project aims to help facilitate the CIRTL grant by providing the following:

- Process workflow creation for the various stages in the project.
- Data warehouse creation and management for the survey data
- Statistical analysis of the survey data and help understand student behavior throughout the country

The finished project will have the following capabilities:

1. An interactive dashboard for:
  - I. Student Annual Survey Results
  - II. Faculty Annual Survey Results
  - III. Student Workshop Results

#### IV. Faculty Workshop Results

#### V. Postdoc Workshop Results

2. A well-maintained database for storing the sensitive student data. It is essential to maintain security as it deals with student's data.
3. A well-defined process workflow– A detailed process from when the surveys are rolled out until the visualization of the results.

### **METHODOLOGY**

The project includes activities to address faculty and postdoc behavior and knowledge about mentoring, advising, and mitigating implicit bias and micro-aggressions as well as activities to support dissertators through workshops similar to faculty workshops, building cohorts and peer mentoring. An annual survey is also deployed every year by the ten university members to understand student views and difference in opinions over a period. The ten alliance members will work together to produce and share information and disseminate change more broadly

### **AUDIENCE OF THE RESEARCH**

Users consist of faculty members of eleven universities namely Boston University, Cornell University, Howard University, Iowa State University, Michigan State University, Northwestern University, University at Buffalo, State University of New York, University of Georgia, University of Maryland, College Park, University of Texas at Arlington and board members of the CIRTl-AGEP which is an NSF program aimed to develop, build and test the impact of a model of a “networked improvement community” focused on improving dissertator

experiences at a variety of institutions with the goal of reducing the effect of negative climate on interest in faculty careers

## **STAKEHOLDERS**

Stakeholders of the project would be:

- I. Members of the CIRTL-AGEP grant
- II. Faculty members from the eleven participating universities
- III. Students from the eleven participating universities
- IV. Institutional leaders
- V. Funding agencies for the CIRTL AGEP grant

## **DISCUSSION**

### **STEM Dissertators and Postdocs:**

- I. Recognize the value of and participate in local professionally-focused learning communities associated with teaching and learning
- II. Make the environment more student-friendly and hospitable by improving student-faculty communications
- III. Interventions and analysis through data and social networks to study the behavior

Communication between the universities to share knowledge with each other

### **Faculty:**

- I. Describe several known high-impact, evidence-based effective instructional practices and materials and recognize their alignment with particular types of learning goals.

## CHAPTER 2 - LITERATURE REVIEW

Education has a lot of importance in the United States and this research emphasizes understanding the educational climate in one university (Iowa State University) and then for future expanding its reach to other universities.

The study examines the likelihood that science-oriented students would participate in a health science undergraduate research program during their first year. The researchers used longitudinal data from the Your First College Year (YFCY) and UCLA Cooperative Institutional Research Program (CIRP) surveys for analysis part. The participant's key predictors in the health science research program are those students who reliance on peer network, and campus provided opportunities for first-year students. The findings show that efforts to the orient students at an early stage, particularly to under-represented minorities, toward biomedical and behavioral science research careers(Hurtado et al)

First-generation students are likely to enter college with less academic preparation, and to have limited access to information about the college experience, either first hand or from relatives (Thayer, 2000).

Academic preparation of Hispanics is lacking: on average, Hispanic students score lower on standardized college-admission tests and require more remedial English and mathematics compared to white students (Schmidt, 2003). The lower grades become a reason for them to lose interest and drop college eventually.

Students from a low-income and first-generation background face obstacles that include: lack of knowledge of the campus environment, its academic expectations, and bureaucratic operations; lack of adequate academic preparation, and lack of family support. First-generation students may encounter a cultural conflict between home and college community (Thayer, 2000).

Educational expectations vary by parents' education as early as 8th grade: Only 55 percent of 1992 high school graduates whose parents had not attended college aspired in 8th grade to obtain a bachelor's degree, compared to 71 percent and 91 percent, respectively, of 8th graders whose parents had attended college or who had a bachelor's degree. Similarly, the likelihood of these three groups taking the SAT or ACT in high school was 25 percent, 42 percent, and 73 percent, respectively (Choy, 2001).

Researchers have developed a comprehensive, quantitative evaluation of an educational intervention program designed to reduce the attrition of minorities from the biological sciences was undertaken to ascertain whether these efforts adequately address the problem. Participants had higher odds of persisting in basic math and science courses, and of graduating in biology, than did a comparison group, controlling for demographics and academic preparation Program participants were also more likely to pursue graduate study than were university graduates overall. This evaluation demonstrates the value of such programs in increasing the representation of minorities in science (Hammarth, M,2000)

The researcher tries to determine similarities and differences between students' perceptions of their learning experiences between 2011 and 20115 in connection to placement-based learning, campus-based learning, and personal circumstances. Data was collected through an online survey that was made available to all undergraduate students. (Hamshire et al)

## CHAPTER 3 - RESEARCH DESIGN

The following paragraphs will talk in details about the steps taken at each stage of the research

### 1. Survey Creation

Two surveys are deployed:

#### I. Annual Survey

There are again two variants in the annual survey - one for the graduate students and faculty each. The surveys take about roughly 30 minutes to complete. The student survey has a total of 87 questions, and the faculty survey has a total of 76 questions

#### II. Workshop Survey

Once the students take part in the workshop, an online survey is sent to them to get their feedback. This is a short survey with 12 questions for each of the three variants of the surveys.

### 2. Process Planning

My involvement with the project began from this stage. Project Planning started as a very early stage, from the spring of 2017 to be precise, so both the Client and I were unaware of the specificity of the process workflow. Process Workflows was created from a broader perspective, and more detailing was added to it as the months passed by. A total of 7 versions were created until now for the process workflow. Lucid chart was used to create the processes for both the surveys and workshops.

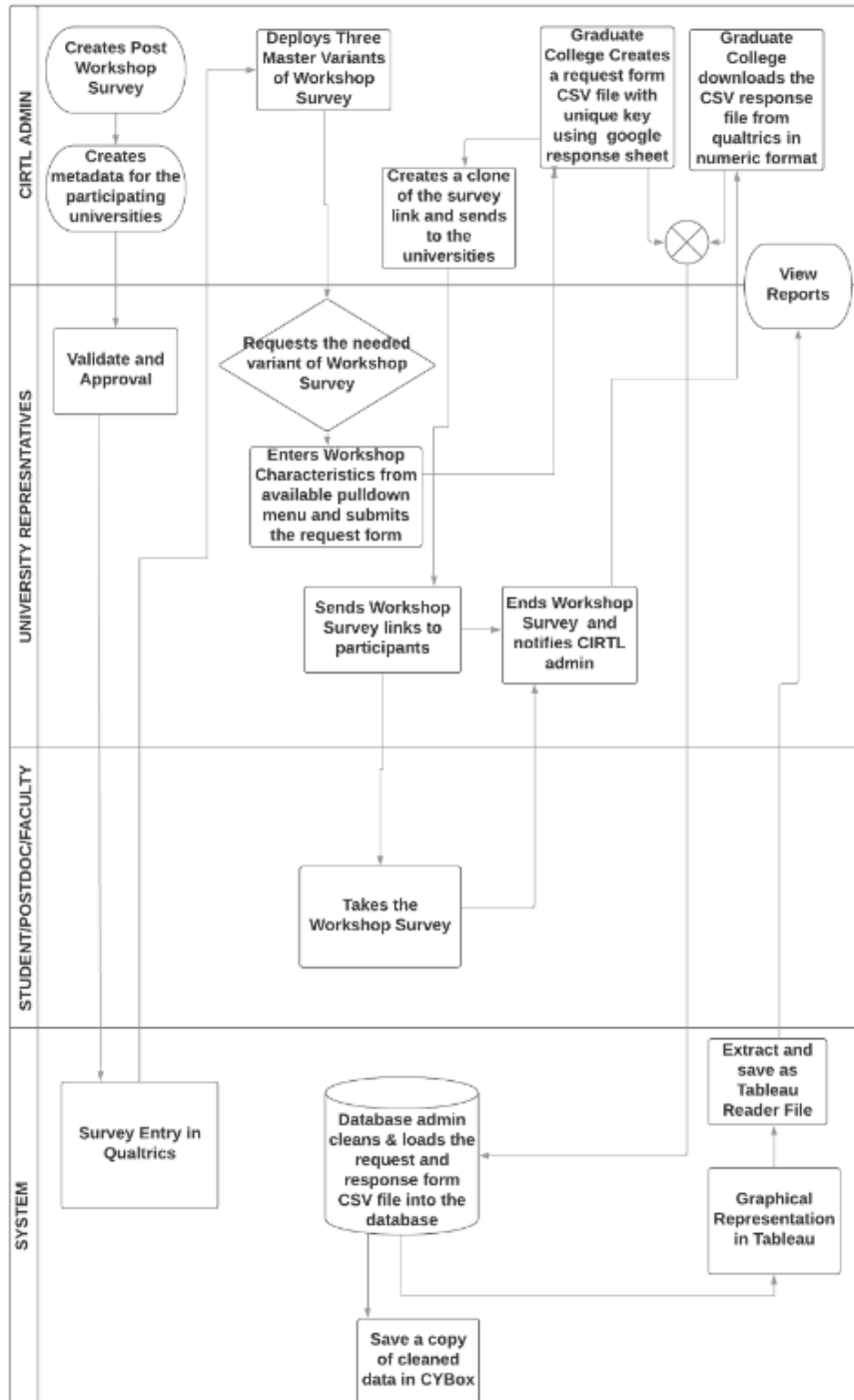


Figure 1: Process Workflow for Workshop Survey

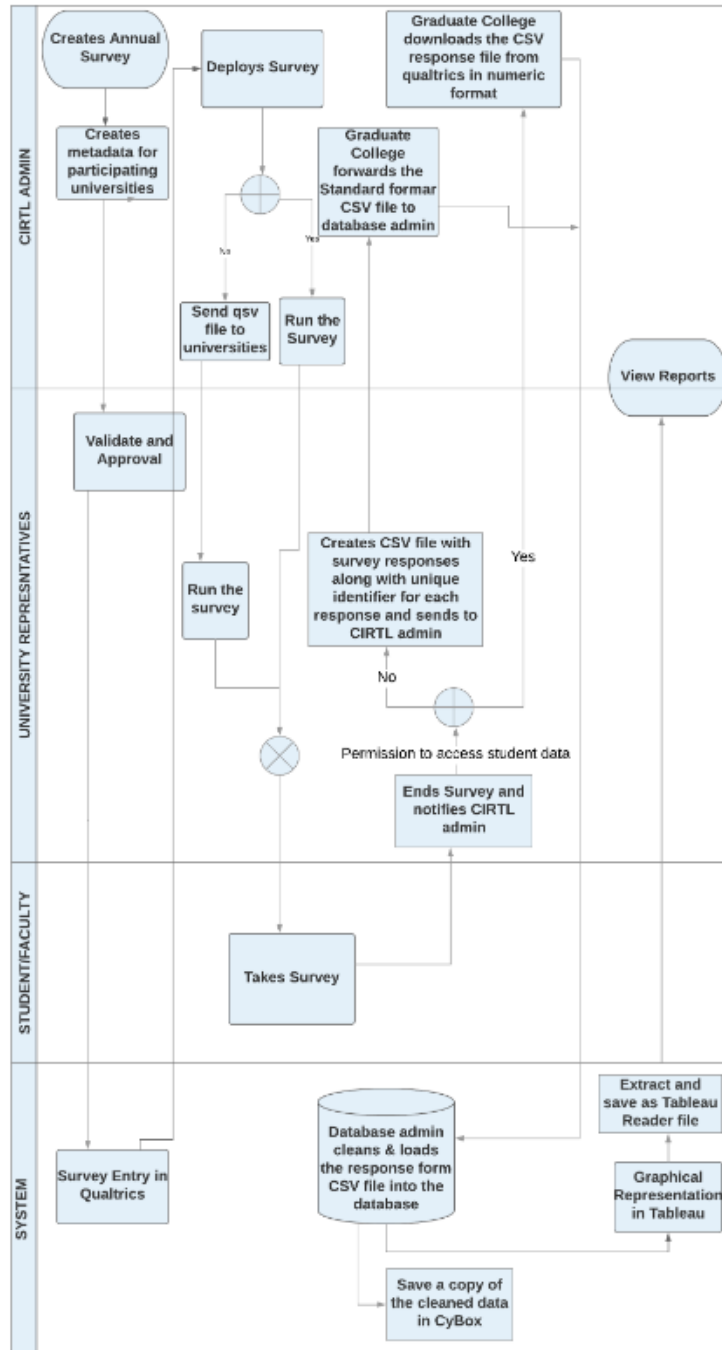


Figure 2: Process Workflow for Annual Survey



### 3. Survey Deployment

Iowa State University is the coordinator for the survey deployment. ISU uses Qualtrics for this purpose. The survey can be filled out through the browser or any mobile app. Each university requests for the survey, ISU send a clone of the survey to the university who then deploy the survey with their software in most cases. Once the individual university claims the survey has ended, ISU closes the survey and downloads a CSV file of the responses.

### 4. Establishing a Remote Server and Creating a Data Warehouse

Given the high-security needs of the project, a remote server was established with restricted access to only the data analyst. A lot of Brainstorming was done to choose the right database for the project. Oracle, MS SQL, and MySQL were thoroughly researched. Given the size of the output and budget issues, Open source system MySQL was chosen for creating the database.

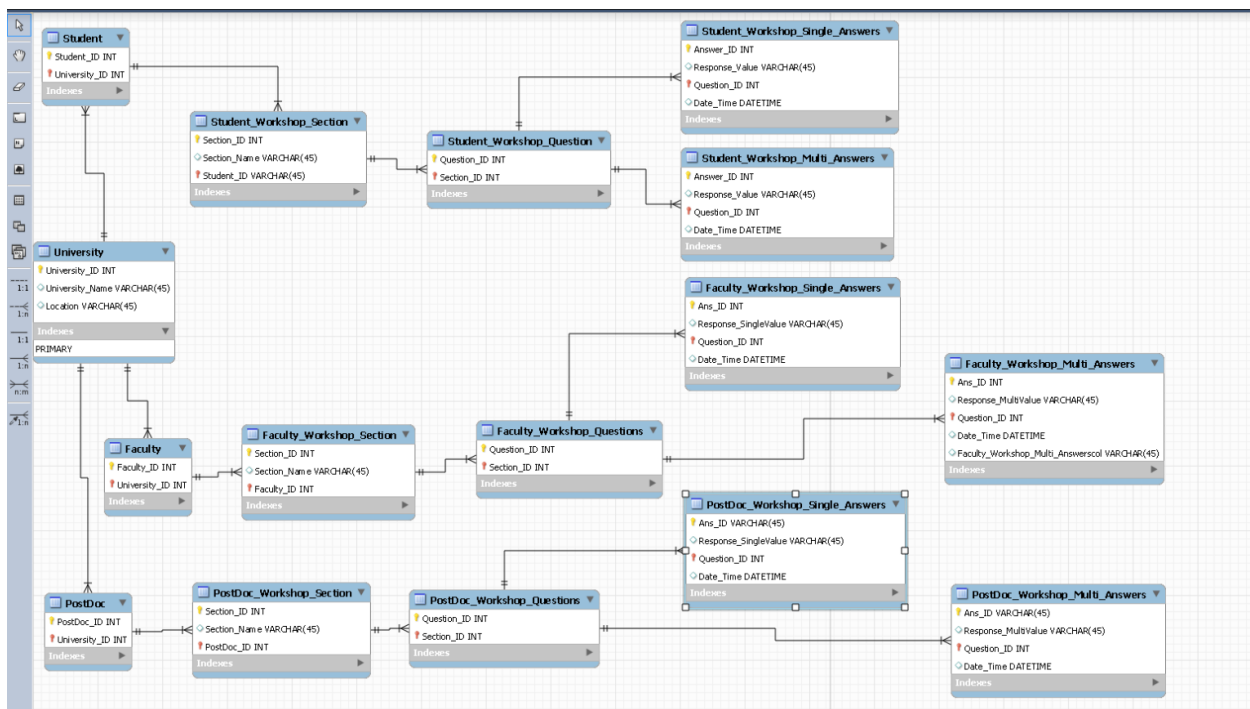


Figure 3: Data Model for Workshop Surveys

Below is the data model that was created in MySQL for Annual Surveys

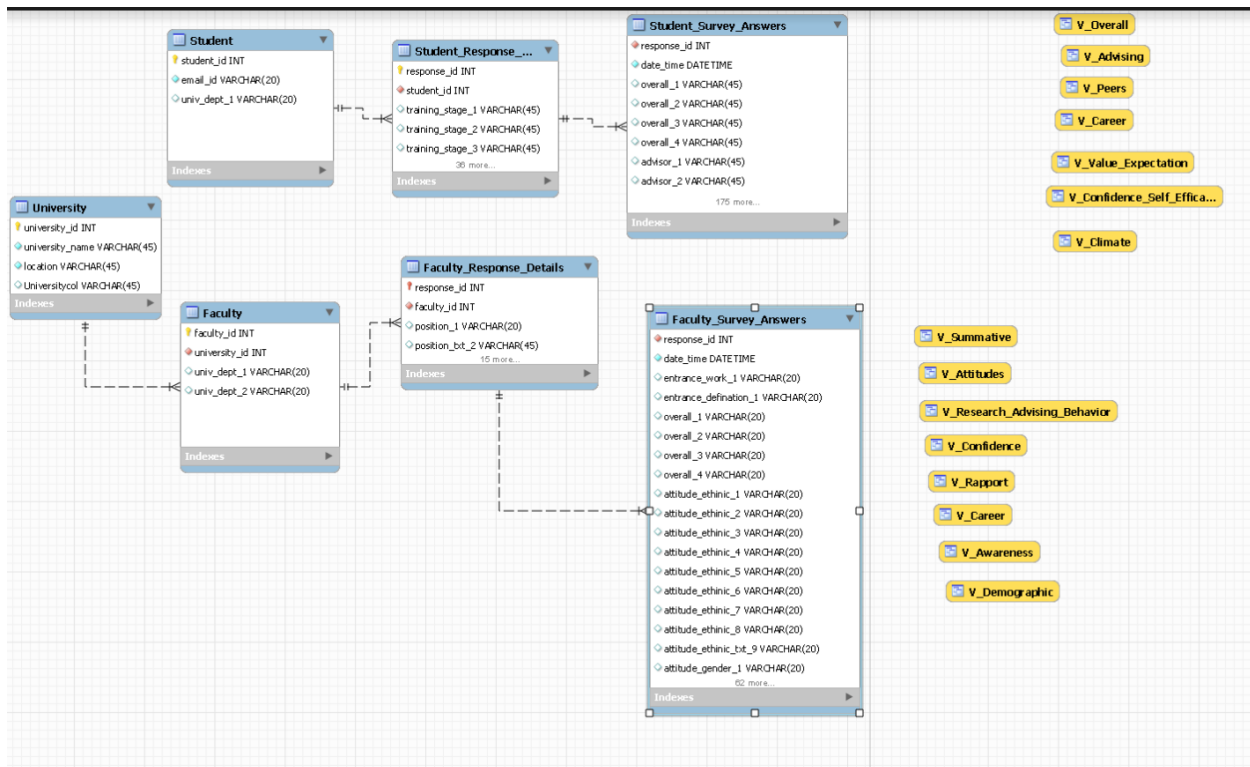


Figure 4: Data Model for Annual Surveys

## 5. Importing to Database

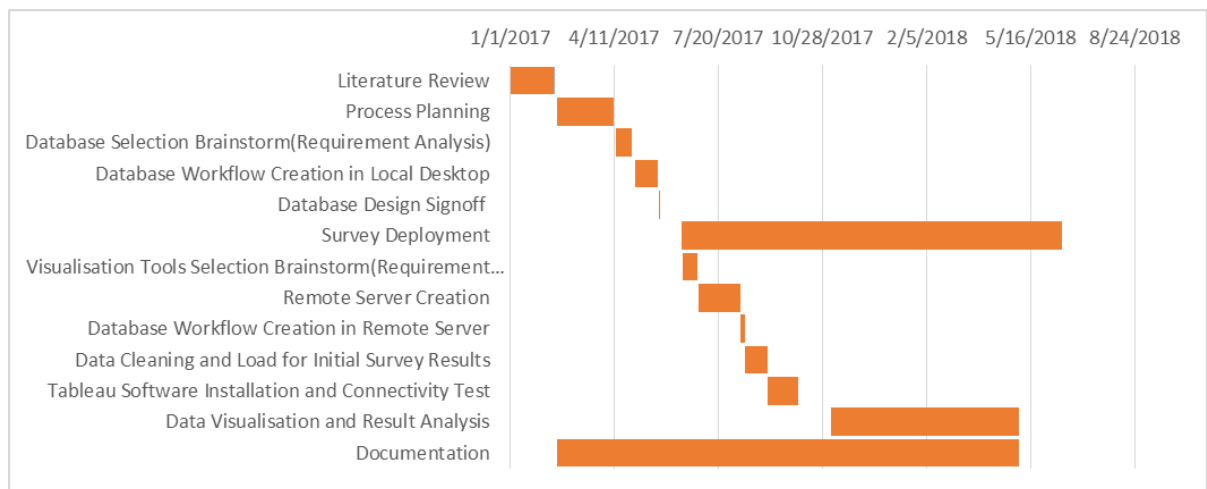
Given that most of the work is done through Excel, We are using Excel for import activity as well. Excel has an add-on called MySQL for Excel. Through this, the database columns are mapped to the excel columns and loaded to the database. In the database the data first loads into the staging table and from there on moves to their respective tables.

## 6. Visualization Techniques

Tableau Desktop is used for creating the visualizations. Dashboards are created through which stories are created. The dashboards are very interactive which let the users use several filters to understand behaviors from different sections of people.

## CHAPTER 4 - PROJECT TIMELINE

The project began in January 2017 and initial months involved researching about similar projects and to understand the domain knowledge. Process planning was a very iterative part, but the initial planning of the project took about three months. While the database was being built with a view of the survey in mind, the survey deployment started in a few universities. As the database had to be hosted in a secure location, I worked with the IT team to set up a remote server. Much brainstorming was done for choosing the right visualization tool, and also between desktop and server versions. Once the survey data was collected from the universities(around August 2017), the data had to be cleaned and loaded for analysis. Every university chose their programs to deploy the survey, so data cleansing was a tedious task. Once the data was ready, visualizations using Tableau began to interpret the results.

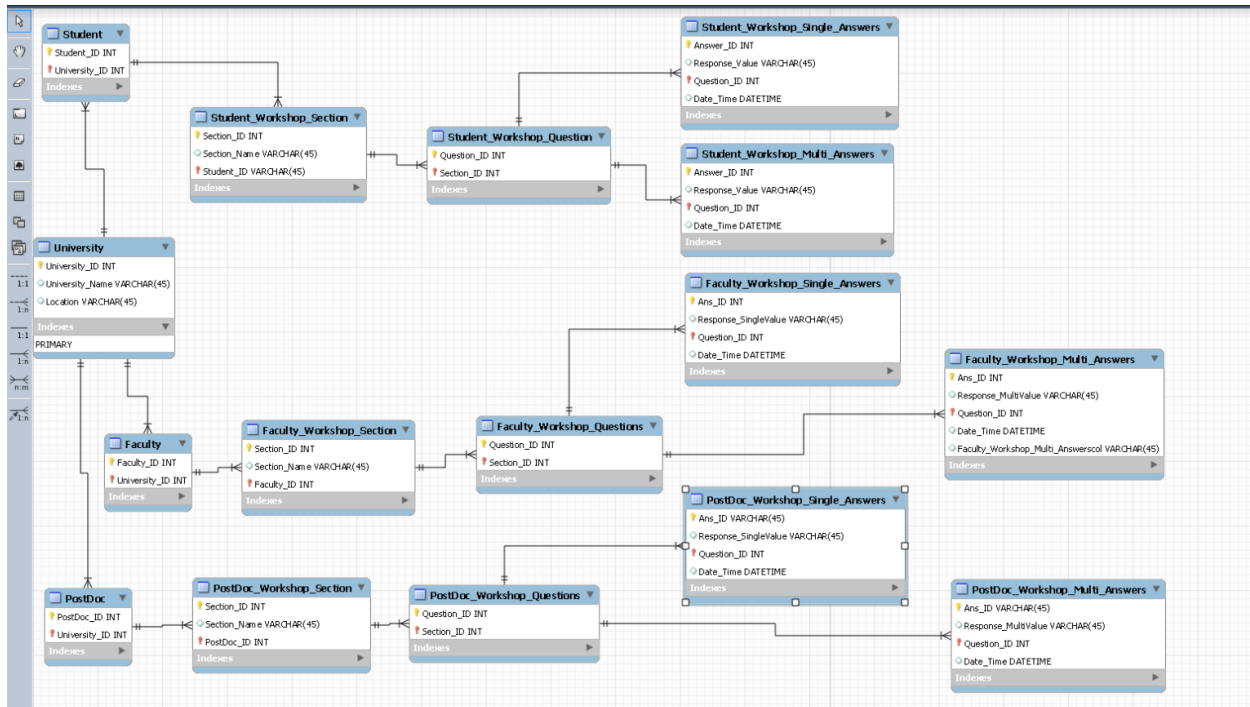


**Figure 5: Gnat Chart displaying the project timeline**

## CHAPTER 5 - DATA DICTIONARY AND UNDERSTANDING

This project has intrinsic data considering that there is data flow from the colleges at any given point. Dealing with vast sets of data using Excel can be cumbersome for both management and analysis. Hence we decided to use a Relational Database and MySQL was chosen for the following reasons:

- **Speed.** MySQL is fast. Its developers contend that MySQL is about the fastest database system.
- **Ease of use.** MySQL is a high-performance but relatively simple database system
- **Query language support.** MySQL understands SQL (Structured Query Language),
- **Capability.** The MySQL server is multi-threaded; so many clients can connect to it at the same time.
- **Connectivity and security.** MySQL is fully networked, and databases can be accessed from anywhere. MySQL supports encrypted connections using the Secure Sockets Layer (SSL) protocol.
- **Availability and cost.** MySQL is an Open Source project with dual licensing.



**Figure 6: Data model that was created in MySQL for Workshop Surveys**

## CREATION OF THE DATABASE

The final database had to be created in a remote server for security reasons and gaining a remote server takes a lot of time. So the database design was created on a local desktop, and the plan was to export the entire database design then. The surveys were being created simultaneously as the database design (we did not know initially that the survey questions would change later on). So having said that, this naturally caused many changes in the database design.

### Few major changes were:

- Multi-valued answer was initially decided to be loaded into a separate table. Later on, after viewing the sample data, a single field was allotted.
- The column names were changed as per the qualtrics survey. This activity happened thrice given that it was the client's decision.

- Staging area set up in the database to load raw data. This plan was thought of in order to aid data cleaning.

## CHANGELOG MANAGEMENT

A change log was maintained to keep track of all the changes done on the database.

Change Log						
Project: CIRTL AGEP						
Change No	Change Type	Description of change	Date Submitted	Status	Comments	Signoff
V 1.0	Design Change for Survey	Two separate tables for single value and multi value answers will not be used anymore. A common base table will be created with all the details in a single table	24/04/2017	Completed	Since Qualtrics exports the data in a way the multi value answers also occupy one column each for every selected answer, the plan is to create a single answers table to reduce complexity of the database	

**Figure 7: Screenshot of the Change Log Document**

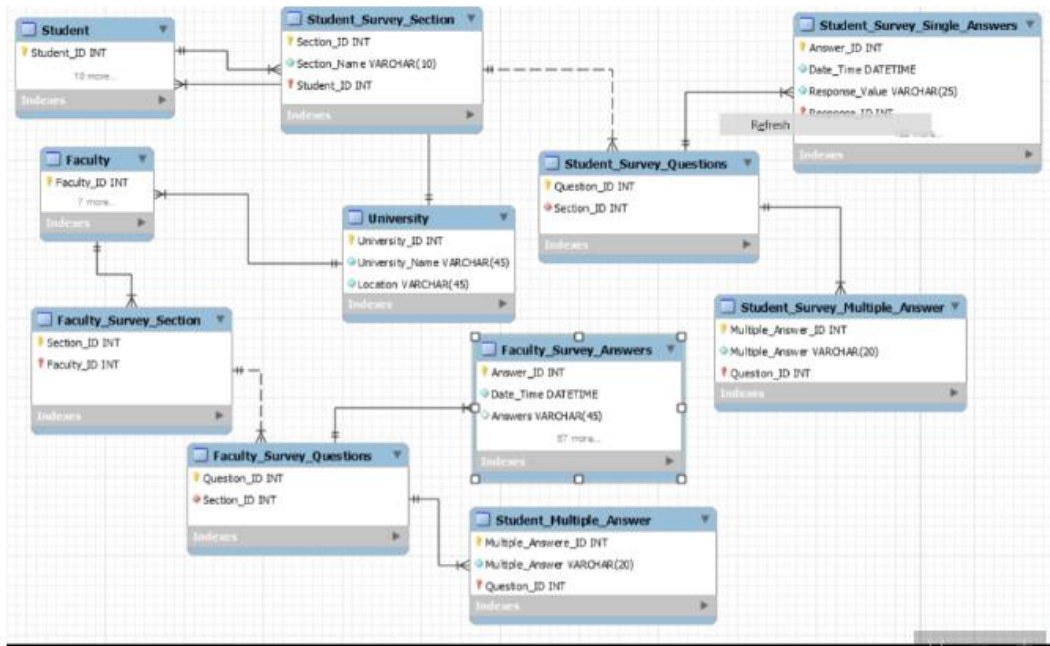


Figure 8: Database design Version v1

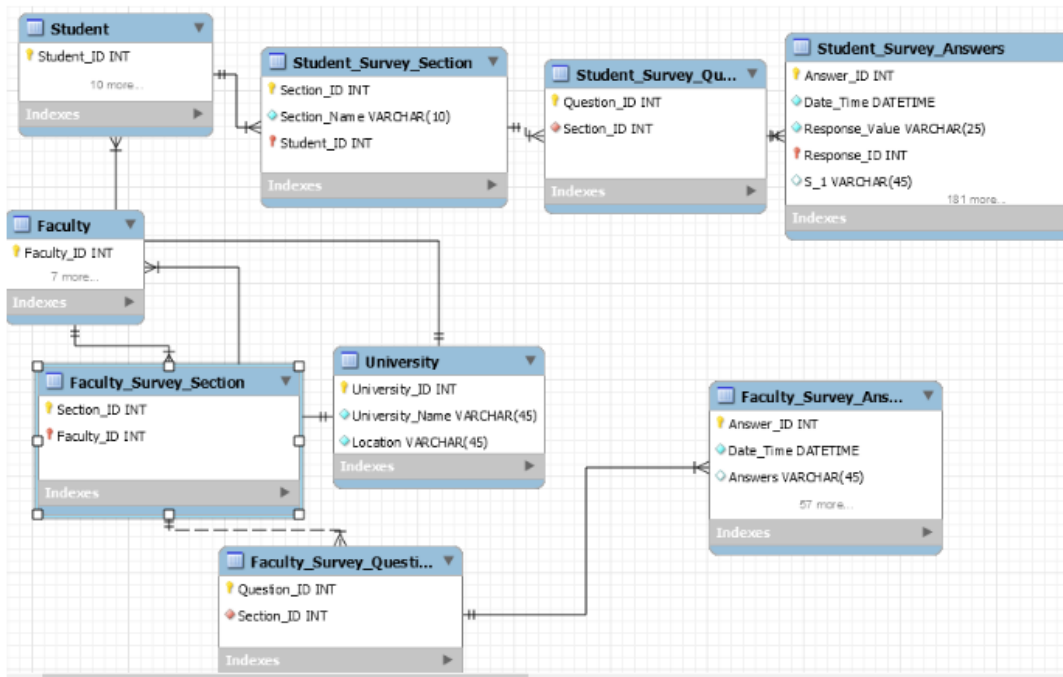


Figure 9: Database Design Latest Version

## DATA GATHERING AND CLEANSING

The CSV files collected from the universities need a lot of data cleansing, given that each university uses its format. Few universities omitted certain sections of the survey to make it more specific for their university, for such universities I had to check the missing data and map it to the database accordingly.

Data cleaning was done using Excel and MySQL

Few cleansing activities are:

1. Converting blank records to Null
2. Removing records which have only 10% of the questions answered
3. Converting alphanumeric records to numeric for calculation purposes
4. Neglected records which have only a response count of less than 5
5. Splitting columns for multi-values data



## CHAPTER 6 - DATA VISUALISATIONS

Data visualization was the final phase of the project. During my time with the project, Iowa State University, University of Buffalo had completed the surveys, so the results that we see below will be findings from these two universities.

Below we can see an overall picture of the faculty and the student's annual surveys (Blue – Faculty members; Orange- Graduate Students).

From the graphs, we can understand that the faculty members at Iowa State University had higher overall ratings than the faculty at University of Buffalo.

Looking further into this, the ratings that the faculty gave for overall belonging, community acceptance, overall enjoyment and likeliness to recommend the college were higher in Iowa State University than University of Buffalo. Having these high level statistics, educators can discuss about the possible reasons that have led to this or look into a deeper level of questions that the survey addresses.

An alarming result that came out of the surveys was that 33% of the students have accepted to facing negative experiences within the university where negative experiences related to sex, country, race and age were the top reasons.

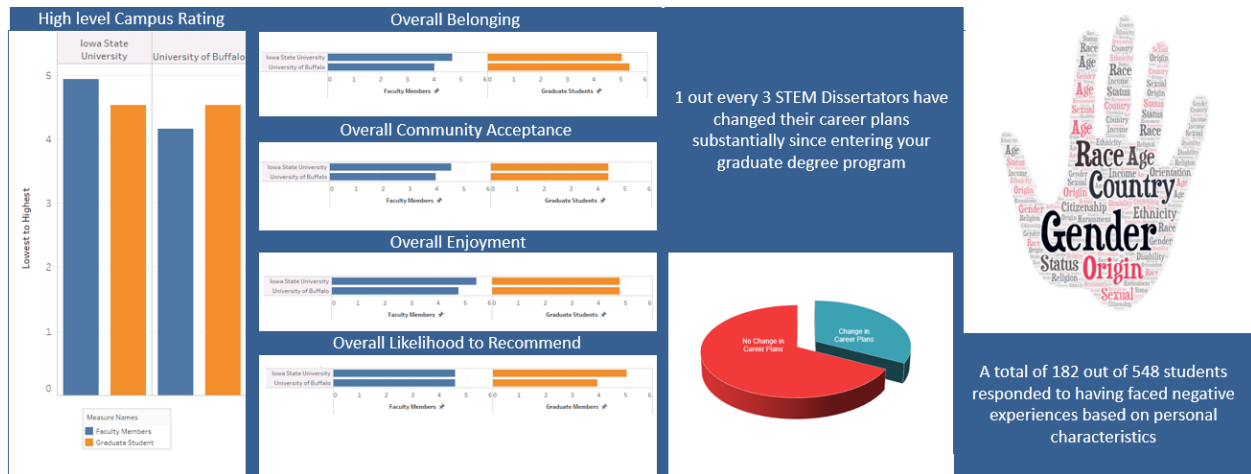


Figure 10: Results from Annual Survey

Workshops surveys were collected after the workshop sessions for every STEM program. The results that came out of these surveys have been positive. After these educational sessions, the statistics say that 63% of the students felt that the sessions helped them in increasing their perspectives, experiences and identities within the academic climate. Terms like micro-aggressions were knew to most of the participants, so the statistics of 64% of students accept that the sessions increased their knowledge has validation.

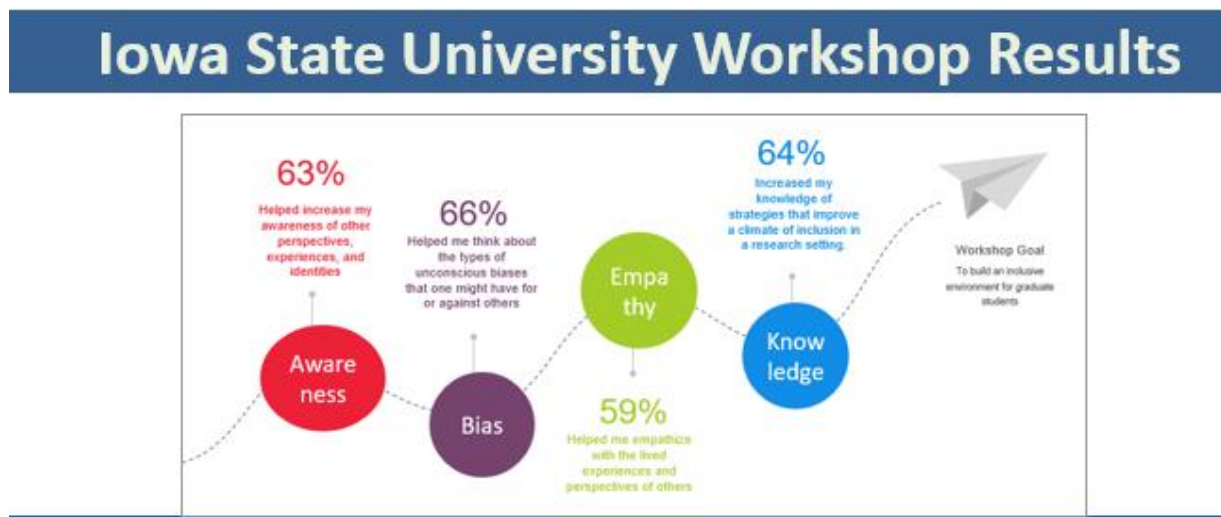


Figure 11: Results from Workshop Survey

Data Visualization was done entirely using Tableau Desktop. The results can be viewed through Tableau Reader. Dashboard stories were created for

- survey types – Graduate Students and Faculty
- workshop types – Graduate Student, Postdoc and Faculty

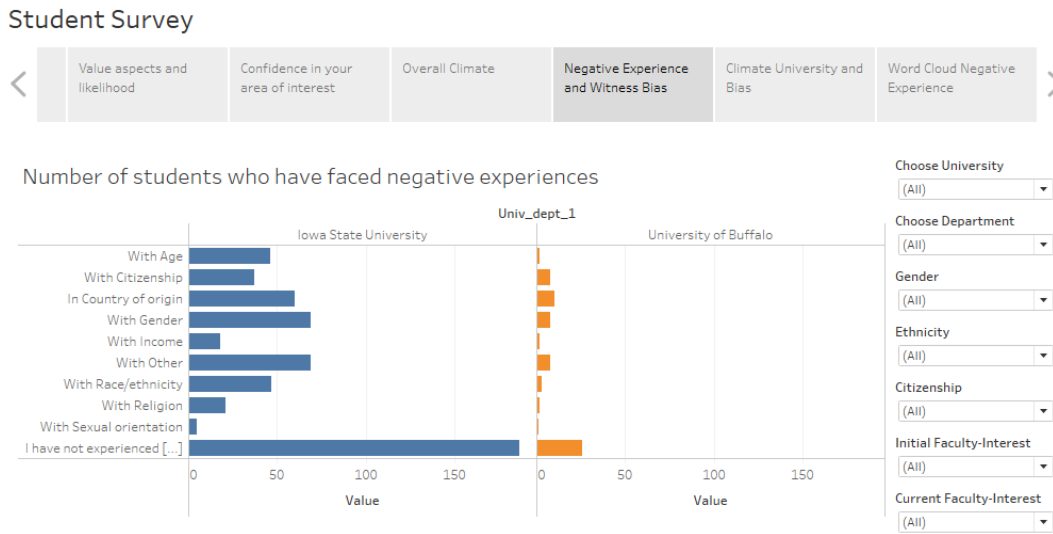
Below, from the student survey we can see that, several filters have been added, so the end users can have a holistic view of the ratings or choose to drill down to university level with more specifics.

To just site an example, for the question- My peers value my research; University of Buffalo has higher ratings than Iowa State University. The next plan of action would be for the two universities to discuss what they do in each program so that the colleges can improve.



**Figure 12: Report from the Student Annual Surveys showing overall climate analysis**

Earlier in the section, I mentioned that 33% of the students have faced negative experiences. Now we can look at those details in particular. Negative experiences based on Gender, Income, Age and Race are on the higher values as compared to others.



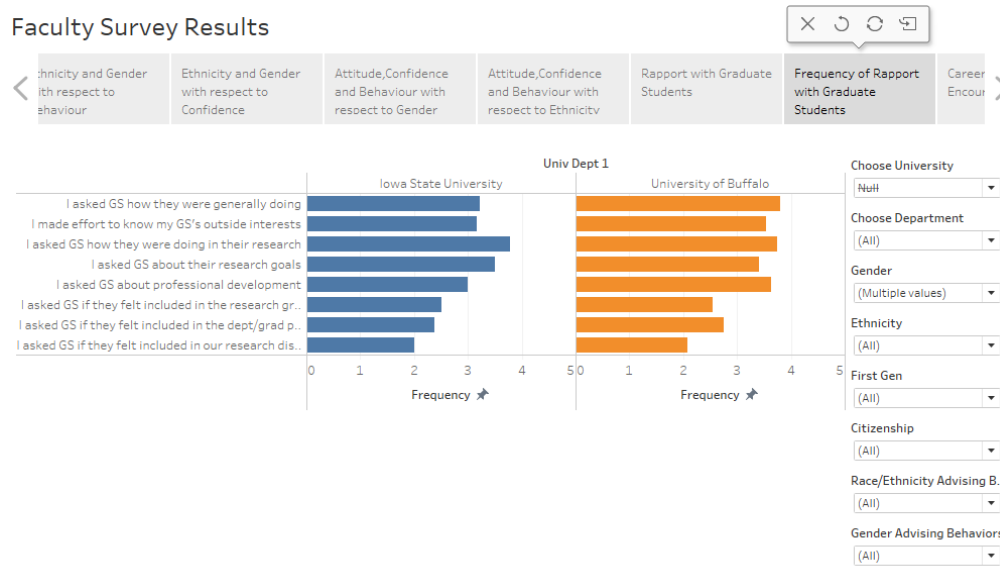
**Figure 13: Report from the Student Annual Surveys showing negative experience and witness bias analysis**

From the below graphs, we can see that University of Buffalo lays more emphasis to gender related questioned based on attitude than Iowa State University.



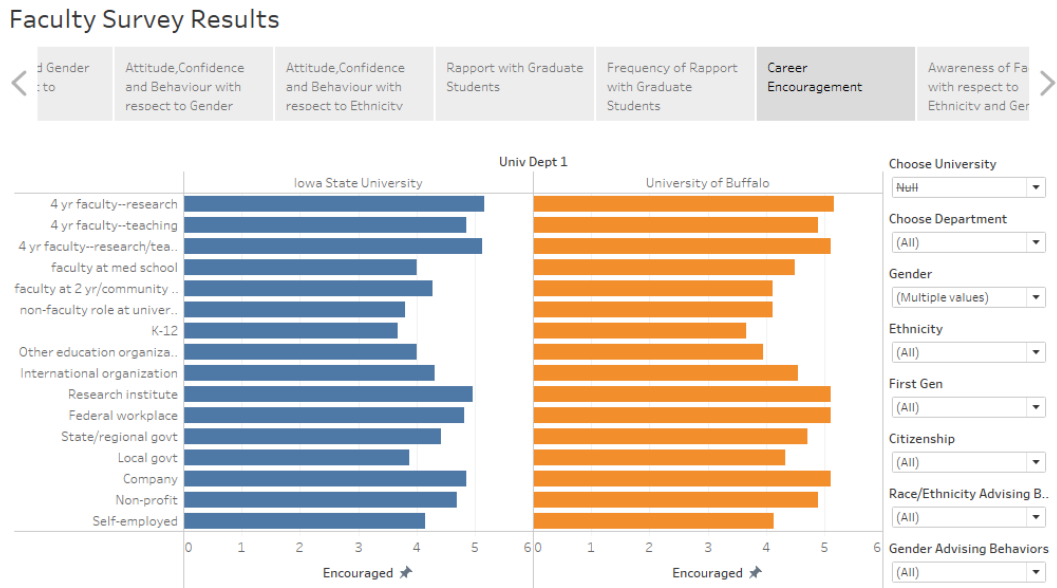
**Figure 14: Report from the Student Annual Surveys showing attitude & behavior analysis**

Similarly from the faculty survey, we can look at the results and act upon them accordingly. Iowa State University and University of Buffalo rated the same for feeling included in the student’s research disciplines. Whereas, University of Buffalo had rated themselves higher for knowing their student’s outside interests.



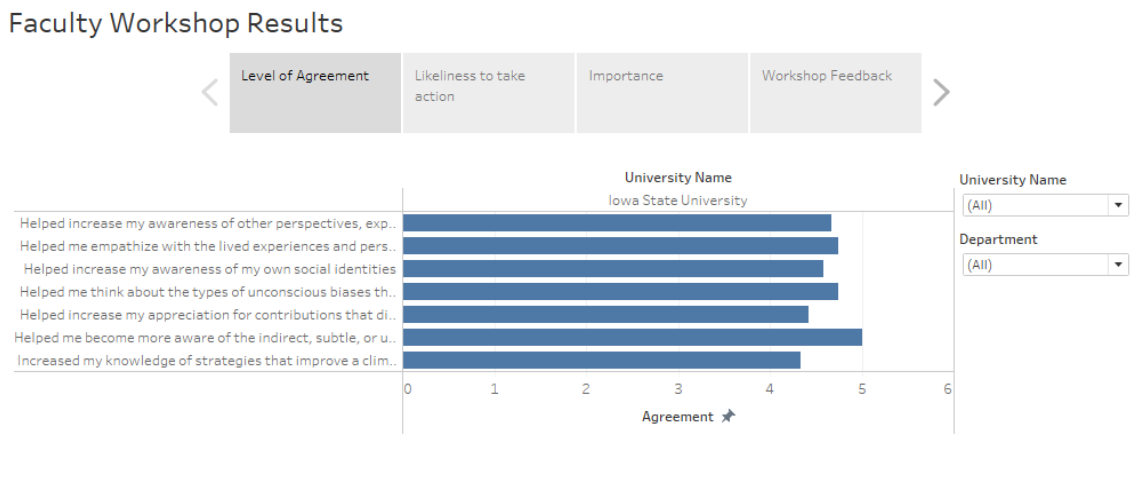
**Figure 15: Report from the Faculty Annual Surveys showing rapport analysis**

Looking at the Career encouragement results, we can see that both the universities have almost the same results apart from ones like federal workplace and non-faculty roles in university. So we imply that the faculty is encouraged to have a career of their choice.



**Figure 16: Report from the Faculty Annual Surveys showing career encouragement Analysis**

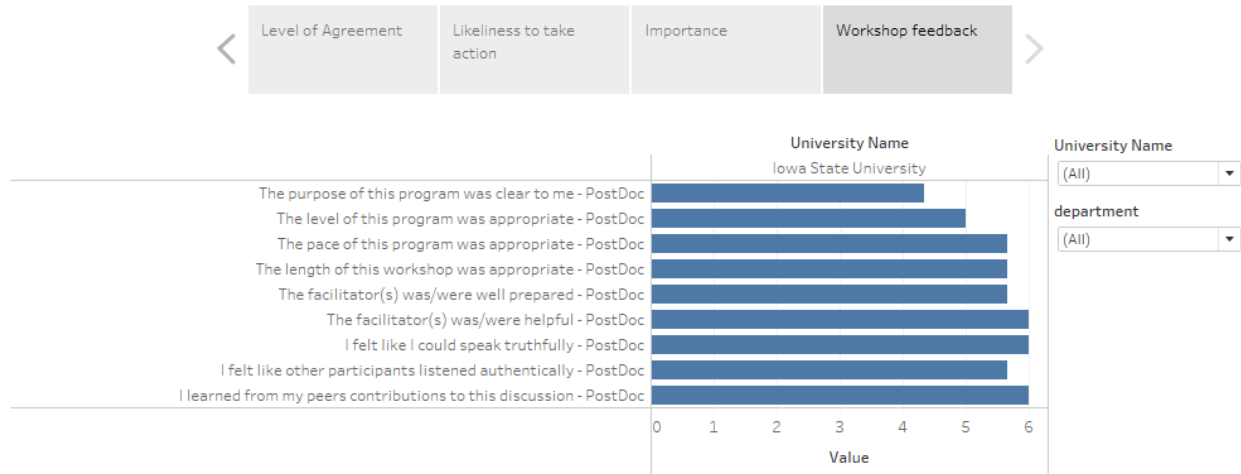
From the faculty workshop results, it looks like most of the participants have had a positive impact after attending the workshops.



**Figure 17: Report from the Faculty Workshop Surveys showing level of agreement analysis**

From the Postdoc results below, we can confidently say that the workshop was a success given the high ratings in the workshop feedback section of the story.

### PostDoc Workshop Results



**Figure 18: Report from the Postdoc Workshop Surveys showing workshop feedback analysis**

Such trends have been captured for all the participant categories and made available to the end users. The CIRTL group meets every quarter to talk about these results.

## CHAPTER 7 - CHALLENGES

Few of the noteworthy changes made during the project are:

### **1. Changes in the process workflow:**

Process workflow has undergone many changes, and with every new version, more detail is added to the workflow. This reduces the confusion between knowing who has the responsibility for a particular work and the project can hence run smoothly. The lucid chart was used to create the workflows. The process workflow was changed as per changes and needs at least 8 to 9 times.

### **2. Database design changes:**

The database design was created on a local desktop, and the plan was to export the entire database design then. The surveys were being created simultaneously as the database design (we did not know initially that the survey questions would change later on). This led to many changes in the database design.

Few major changes were:

- I. Multi-valued answer was initially decided to be loaded into a separate table. Later on, after viewing the sample data, a single field was allotted.
- II. The column names were changed as per the qualtrics survey. This activity happened thrice given that it was the client's decision.
- III. Staging area set up in the database to load raw data. This plan was thought to do some data cleaning.



### 3. Changes in data visualizations:

In order to be prepared when the survey deployed we created sample data and tried out the various kinds of visualizations that we would want to interpret. The initial analysis was done and presented to the board of members of CIRTL-AGEP. Feedback was taken from them to be implemented in the primary survey. Initially, histogram analysis was used to display the results. Students and faculty data were shown simultaneously to understand the difference in opinions between the two groups. Later on, it was decided to let the two groups have its own analysis.

The dashboards were initially decided as one holistic dashboard for the entire group of participants, but given the magnitude of questions each surveys has; it was later on changed to creating separate story dashboard for each category.

SRS requirements and Changelog were two documents that were maintained throughout the project to track the changes being made.

## CHAPTER 8 - CONCLUSION AND FUTURE RESEARCH

### CONCLUSION

A database was set up with a workflow to cleanse and load the data into the system. A well-defined process workflow was built which gives the project directions about what needs to be done from the starting of survey creation to deploying the dashboards.

The initial analysis shows that every student behaves individually, but the causes can be narrowed down to few major ones which when dealt with improving the student's mentality towards following a particular career path or maintaining their initial career plans.

Factors like parent's education, sex, origin showed were correlated to participant's behavior and thoughts about their careers. Representatives from the universities went through the visualizations and found it useful to study student behavior.

### FUTURE RESEARCH

Deployment of the surveys from all the affiliated universities is estimated to be completed by the summer of 2018. Iowa State University and the University of Buffalo completed the first year's survey during my stint with the project.

Representatives from the universities will then meet and discuss improving the academic climate change based on the workshop experiences and data collected

The project is estimated to run till September 30, 2021, with an aim to create a super-structure of the ten alliance members which will work together to produce and share information and disseminate change more broadly

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APPENDIX

Survey Results of Workshop – Graduate Student

StartDate	EndDate	Status	IP Address	Progress	Duration	Finished	Recorded
Start Date	End Date	Response	IP Address	Progress	Duration	Finished	Recorded
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2/28/2018 10:11	2/28/2018 10:14	0	129.186.25	100	190	1	#####
2/28/2018 13:14	2/28/2018 13:55	0	129.186.25	100	2454	1	#####
2/28/2018 16:14	2/28/2018 16:15	0	129.186.25	100	60	1	#####
3/1/2018 8:02	3/1/2018 8:08	0	129.186.25	100	381	1	#####
3/1/2018 13:14	3/1/2018 13:18	0	129.186.25	100	234	1	#####
2/28/2018 9:27	2/28/2018 9:29	0	129.186.25	11	99	0	#####
2/28/2018 12:03	2/28/2018 12:05	0	129.186.25	11	79	0	#####
2/28/2018 9:35	2/28/2018 13:16	0	129.186.25	11	13253	0	#####
2/28/2018 16:27	2/28/2018 16:27	0	129.186.25	11	9	0	#####
3/8/2018 13:22	3/8/2018 13:27	0	129.186.25	100	301	1	#####
3/8/2018 20:14	3/8/2018 20:17	0	173.23.3.1	100	209	1	#####
3/9/2018 9:37	3/9/2018 9:38	0	129.186.25	100	82	1	#####
3/8/2018 13:23	3/8/2018 13:24	0	129.186.25	11	15	0	#####

Response	Recipient	Recipient	Recipient	ExternalR	LocationL	LocationL	Distributi	UserLang	Q1	Q6_1	Q6_2	Q6_3	Q6_4	Q6_5	Q6_6	Q6_7	Q6_8	
Response	Recipient	Recipient	Recipient	ExternalR	Location	Location	istributi	UserLang	PROGRA	Please inc	Please inc	Please inc	Please inc	Please inc	Please inc	Please inc	Please inc	
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R_1QiulyziDKhhJNS							anonymo	EN		1								
R_3IwV5Okts8Ni2jP							anonymo	EN		1								
R_0lnag3GNnhWwy5							anonymo	EN		1								
R_1f08FFPBZGY1BT5					42.036	-93.4652	anonymo	EN		1	3	4	4	4	4	4	4	3
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R_2vdhzwRHP8xXED3					42.036	-93.4652	anonymo	EN		1	6	6	6	6	6	6	6	6
R_3NPQ5dRD202BAHW							anonymo	EN		1								

AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
Q7	Q8	Q9_1	Q9_2	Q9_3	Q9_4	Q9_5	Q9_6	Q9_7	Q9_8	Q9_9	Q9_9_TEX	Q10_1	Q10_2	Q10_3	Q10_4	Q10_5	Q10_6
What are How like	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	Please inc	Please inc	Please inc	Please inc	Please inc	Please inc
{\"Importid\":\"Importid\",\"Importid\":\"Importid\",\"Importid\":\"Importid\",\"Importid\":\"Importid\",\"Importid\":\"Importid\"}																	
Listen to €	5	2	5	5	2	5	3	3	4			4	5	5	5	4	5
Be more c	5	4	5	5	2	4	4	3	4			5	5	4	3	4	5
I'm in the	3	1	2	2	2	2	2	2	2			5	2	5	5	3	2
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Be transp	4	5	4	5	2	3	4	4	4	4	4	4	5	5	5	5	5
Be aware	4	4	5	6	3	5	5	4	5			4	5	5	6	6	5
1. apprec	5	5	5	6	2	5	5	5	5	3		2	2	2	5	2	2
Learn mo	5	3	5	5	2	3	3	3	4			5	5	5	4	5	5
	5	6	6	6	6	6	6	6	6	6	6	6	5	5	5	6	5

### Survey Results of Annual Survey – Graduate Student

Career_cj	Career_p	Career_p	Career_p	Career_p	Career_p	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in	Career_in
Select the	Select the	Select the	Select the	Select the	Select the	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t	Thinking t
(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic
2		3	2	4														
5	6	5	6	5		5	1	1										
		2																
4	5	5	3	5	2	6	4	4	4	4	2	5	4		5	5	5	5
1	1	1	1	1	1	1	6	4	1	5	4	1			1	1	1	1
			6					6										
4	1	1	4	1	1	6	2	5	1	1	3	1	1		1	2	1	1
5	5	2	5	5	2	5	5	5	1	1	5	1	4		5	5	4	4
1	3	3	5	4	6	4	4	4	1	1	1	1	1		1	1	1	1
6	5	5	5	5	3	6	6	6	6	4	4	3	2		3	3	3	2
1	4	5	1	2	1	4	6	5	1	1	1	6	4		1	1	1	3
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1	1	1	1	1	1	6	6	6	1	6	1	1	1		1	1	1	1
3	3	2	3	3	5	5	6	5	3	3	2	1	3		2	2	2	2

Career_in	Career_in	Career_in	Career_in	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei	Career_ei
Thinking t	Thinking t	Thinking t	Thinking t	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr	In your gr
(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic
				4	2													
5	5		2	5	5	5	5	5	5	5	5		5	5	5	5	5	5
1	1	1	1	6	2	4		1	1	2			3	3	4	4	3	2
1	6	1	1	6	6	6	6	6	6	6	1		4	6	6	6	6	6
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6	1	1	1	6	3	5	1	1	4	5	5 ETS		3	5	3	3	5	6
1	6	2	4	5	3	5	3	1	3	2	2		4	5	5	3	2	4
1	2	2	1	6	4	5	5	3	2	3			5	5	6	3	3	6
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2	3	3	6	6	5	6	4	4	4	1	4		6	6	6	5	5	6

Career_ei	Career_ei	Career_ei	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Career_fc	Value_as	Value_as	Value_as	Value_as	Value_as
In your gr	In your gr	In your gr	Have you	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp	How imp
(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic	(^Importic
5	5		2																
2	2		2																
6	5		2																
5	4		2																
4	5		1	6	1	2	2	6	6	1	1	1		3	1	6	1	6	
1	1		1	4	4	4	2	5	6	2	5	1		5	4	4	5	6	
1	1		2											5	6	6	6	6	
5	4		2											6	3	4	3	4	
4	2		1	4	5	1	1	3	6	1	1	5		4	6	3	4	3	
4	2		2											6	6	6	6	6	
6	4		2											4	6	6	5	6	

Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_asf	Value_like	Value_like	Value_like	Value_like	Value_like	Value_like	Value_like	Value_like	Value_like	Value_like
3	3	4	3	5	3	2	2				5	4	4	3	3	4			4	
5	5	5	6	6	6	5	5				5	6	5	5	5	6	5	6	5	5
							2					3								
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6	3	4	5	6	3	4	5				6	5	6	6	5	6	2	4	3	3
5	6	6	6	6	4	6	5				5	4	6	4	4	4	1	3	2	2
5	3	5	6	5	4	3	1				6	6	5	1	4	3	1	1	4	4
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6	6	6	6	2	5	6	1	1			5	6	5	5	4	4	2	3	4	4
6	5	5	5	4	4	5	2				6	6	5	5	4	5	4	4	4	3

EV	EW	EX	ET	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN
Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r
Please rat	Please rat	Please rat	Please rat	Please rat	In your gr	In your gr	Have you	Have you	Please rat	Please rat	Please rat	Please rat	Please rat	Please rat	Please inc	Please inc	Please inc	Please inc
4	3	3	5	1	1,2,3,4,11		1,2,3,4,5,6		3	4	2	4	3	2	3	3	4	3
5	6	5	6	6	4,5		5		5	6	5	6	5	6	1	1	1	1
					2,3,7,8,11,12		1,2,3,4		4	5								
					2,3,4		1,2,3											
4	4	4	3	2					5	4	2	2	1	3	1	1	1	1
6	5	2	5	3	11				5	2	5	5	5	5	2	2	2	2
5	6	3	3	4	11		11		5	4	5	4	4	4	1	1	1	1
5	5	2	6	1	11		11		5	2	4	3	4	4	1	1	1	1
4	6	1	4	1	5		5,7		5	2	5	1	5	1	2	2	1	1
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6	6	1	6	4	11		11		6	1	6	6	6	6	1	1	1	1
5	5	2	4	2	11		11		6	1	6	5	6	4	1	2	1	1
5	5	1	5	4			1,2,3,5,7,8		5	2	5	4	6	4	1	1	1	1
3	2	4	6	6	1,5,7		5,7,9		2	2	5	5	4	1	1	5	4	5
6	5	5	5	3			11		6	2	6	6	5	6	1	1	1	2

Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Climate_r	Univ_dep	Univ_dep	Training_3	Financial	Financial	Gender	Gender_7	Sexuality	Sexuality	Citizenshi	Citizenshi	Ethnicity
Please inc	Please inc	Please inc	Please inc	Please inc	Please inc	Please inc	At which	At which	What sta	Which of	Which of	How do y	How do y	Do you id	Do you id	What is y	What is y	How do y
4	2	4	5	4	4		1		47	1,2,3,4	1,2,3,4,15	test three	7	test box4	6		2	3
1	3	2	2	1	1		1		13		7,4,7		3		3		3	1
					3	lalalalala	1		4,5	3,4			4					
									1	9	5	4		3				3
									1	28	2	4		6		3		1
2	3	4	1	1			1		60	1,3,4			3		3		3	7
2	1	2	2	2			1		56	1	4		3		3		3	8
1	1	3	2	2			1		20	2,3	3,4		6		3		3	3
1	1	1	1	1			1		26	2,3		4	6		3		1	7
1	1	3	3	1			1		60		2,5,9,11		6		3		1	7
1	1	2	1	2			1		60		2,1,3,4,9		6		2		1	7
1	1	1	1	1			1		11		1,3,9,10,11		3		3		3	7
1	2	2	1	1			1		47	2,3		4	3		3		1	7
1	1	1	1	1			1		2,3				3		3		1	7
2	2	6	2	2			1		64	1	3		6		6		1	2
2	1	1	1	1	1		1		41	2,6	9		6		3		1	7
2	2	2	1	1			1		48	2	4		4		2		2	1



Financial	Financial_Gender	Gender_7	Sexuality	Sexuality_Citizenshi	Citizenshi	Ethnicity	Ethnicity_FirstGen	Enter Emt	university	University	Center N	Center P	center na	center phc		
Which of	Which of	How do y	How do y	Do you id	Do you id	What is y	What is y	How do y	Do you id	Enter Emt	university	University	Center N	Center P	center na	center phc
1,2,3,4,15	test three	7	test box4	6	2	3	1									
4,7	3	3	3	3	3	1	2									
3,4	4															
	4	3				3	2			Iowa State University			Student	C 515-294-50		
	4	6	3	3	3	1	1			Iowa State University			Student	C 515-294-50		
3,4	3	3	3	3	3	7	2			Iowa State University			Student	C 515-294-50		
	4	3	3	3	3	8	2			Iowa State University			Student	C 515-294-50		
3,4	6	3	3	3	3	3	1			Iowa State University			Student	C 515-294-50		
	4	6	3	1	7	7	2			Iowa State University			Student	C 515-294-50		
5,9,11	6	3	1	7	7	2	2			Iowa State University			Student	C 515-294-50		
1,3,4,9	6	2	1	7	7	2	2			Iowa State University			Student	C 515-294-50		
3,9,10,11	3	3	3	7	7	2	2			Iowa State University			Student	C 515-294-50		
	4	3	3	1	7	7	2			Iowa State University			Student	C 515-294-50		
	3	3	3	1	7	7	1			Iowa State University			Student	C 515-294-50		
										Iowa State University			Student	C 515-294-50		
3	6	6	1	2	1					Iowa State University			Student	C 515-294-50		
9	6	3	1	7	1					Iowa State University			Student	C 515-294-50		

SRS requirements – Snapshot of Table of Contents

Table of Contents

Table of Contents..... ii

Revision History..... ii

1. Introduction..... 1

    1.1 Purpose..... 1

    1.2 Document Conventions..... 1

    1.3 Intended Audience and Reading Suggestions..... 1

    1.4 Product Scope..... 1

    1.5 References..... 1

2. Overall Description..... 2

    2.1 Product Perspective..... 2

    2.2 Product Functions..... 2

    2.3 User Classes and Characteristics..... 2

    2.4 Operating Environment..... 2

    2.5 Design and Implementation Constraints..... 2

    2.6 User Documentation..... 2

    2.7 Assumptions and Dependencies..... 3

3. External Interface Requirements..... 3

    3.1 User Interfaces..... 3

    3.2 Hardware Interfaces..... 3

    3.3 Software Interfaces..... 3

    3.4 Communications Interfaces..... 3

4. System Features..... 4

    4.1 System Feature 1..... 4

    4.2 System Feature 2 (and so on)..... 4

5. Other Nonfunctional Requirements..... 4

    5.1 Performance Requirements..... 4

    5.2 Safety Requirements..... 5

    5.3 Security Requirements..... 5

    5.4 Software Quality Attributes..... 5

    5.5 Business Rules..... 5

6. Other Requirements..... 5

Appendix A: Glossary..... 5

Appendix B: Analysis Models..... 5

Appendix C: To Be Determined List..... 6



## SRS requirements – Introduction Page

### 1. Introduction

This section specifies the requirements specifications needed for the CIRTl AGEp project. It aims in providing the scope of the system that we plan to develop in the project.

To brief about the project, Surveys would be conducted with common set of questions at nine different universities across United States of America. The questionnaire consists of two parts, one for students and faculty each. There will also be workshops conducted in the same nine universities and data regarding the effectiveness of the workshops will be recorded.

Our aim with this project is to integrate all the data from the universities into a secure system and make it available for an analytical platform to understand the climate changes within the universities.

#### 1.1 Purpose

To set up an efficient database system for investigating organizational climate for underrepresented graduate students through data analysis techniques. The users should also be able to easily analyse the survey data in form of graphical representation. In order to provide this we plan on building a dashboard which is easily accessible to users accompanied by the support of a robust database system. To add on, this document also allows the project members and clients to track the progress (weekly) of the project to track the completion status and also understand the scope of the setup.

#### 1.2 Document Conventions

General knowledge and thoughts about the project is typed in normal font and the Headers are typed out in **Bold** format.

#### 1.3 Intended Audience and Reading Suggestions

Current audience for this material is the project members, project mentor and the clients. The SRS contains a high level view of the functionalities that the project would provide. As the project progresses will plan to develop new versions which would be helpful for the end users to use the tool and database.

#### 1.4 Product Scope



### Comparison between Tableau Desktop and Tableau Online

	<b>Tableau Desktop</b>	<b>Tableau Online</b>
<b>Products for installation</b>	Desktop	Both desktop and online licensing
<b>Functionality</b>	The authors will work in standalone systems and only they will have access to workbooks unless explicitly shared.	All the users can have access the workbooks when available online and users can make edits to it as well.
<b>Pricing</b>	Free up to a year as an ISU student	Anyone( whether creating or viewing ) who would require access to the dashboards will be considered as a user  \$500 per user/year So in our case, 9 universities + Kaitlyn = \$5000 per year
<b>Sharing</b>	The workbooks need to be shared by the authors and the viewers can open it with Tableau reader	The workbooks will be hosted online and the viewers will be provided with URL links.
<b>Security</b>	Need to publish the dashboards link in cybox or any other secure means	Most secure as it is hosted on Tableau cloud and every user will have log in details.
<b>Creation of dashboards</b>	Same functionality as both is done in desktop	Same functionality as both is done in the desktop. Editing can further be done online as well.
<b>Access to the data source</b>	No access to the data source	Can restrict the access to the data source
<b>Mobile feature</b>	It looks like it is not available for desktop	Supported by Online Version
<b>Update in workbook</b>	A new link would again need to be sent in case any changes are being made	No specific action need as it takes in live data and hosts it online