

Develop a Highly Efficient IR Office

Mānoa Institutional Research Office (MIRO)
University of Hawai‘i at Mānoa



Newsletter and Symposium



18 issues & over 1,000
newsletter subscribers



12 symposiums that document
major aspects of our office's work

An Efficient IR Office

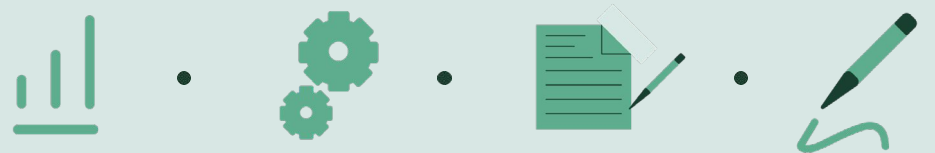
3 full-time staff
2 student helpers

- ⚙️ **Regular IR data reporting responsibilities**
- ⚙️ **Many best practices and innovations**
 - website design
 - Homegrown data reporting software
 - Survey design and administration
 - Support sustainability efforts
 - Ranking information management and usage
 - Qualitative data analysis and dissemination
 - Effective data education and communication efforts
- ⚙️ **Acknowledgements in the IR field**

Overview

Reduce repetitive work and inefficient communication.
Automate data preparation, reporting, & communication efforts

1. Address major IR Bottleneck Issues
2. Key decisions: develop homegrown data reporting tools vs. using Tableau
3. Helpful skills & tools to improve efficiency





Yang Zhang

Director of Institutional Research



Bryson Kalani McFeeley

IT Specialist



Diego Yip

Multimedia Specialist



Kelly Jung-ts Lin

Institutional Research Analyst



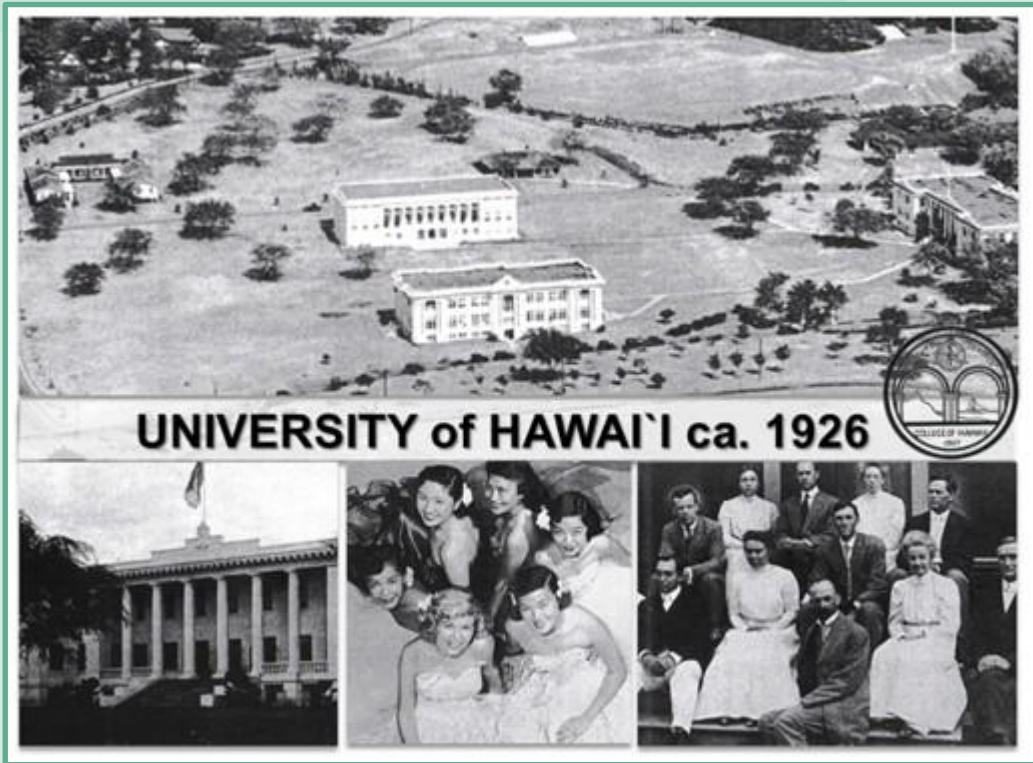
Karese Kaw-uh

Graduate Assistant

Location



Flagship Campus of the University of Hawai'i System

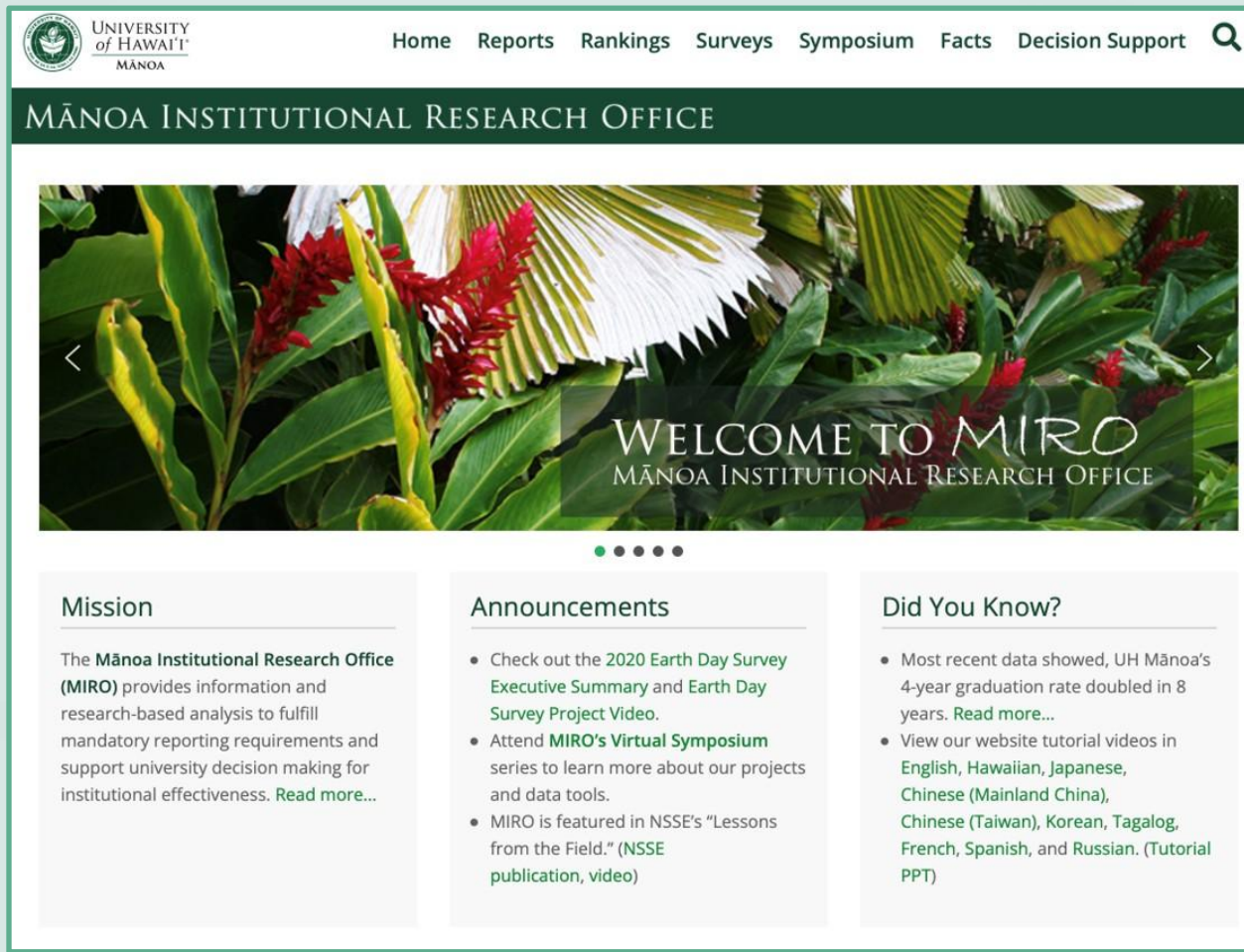


UHM in past



UHM now

Mānoa Institutional Research Office (MIRO)



- ⚙️ Preparing internal & external reports
- ⚙️ Supporting accreditation & program review's data needs
- ⚙️ Conducting surveys
- ⚙️ Addressing data inquiries from campus decision makers & general public

What Does Efficiency Mean to You?

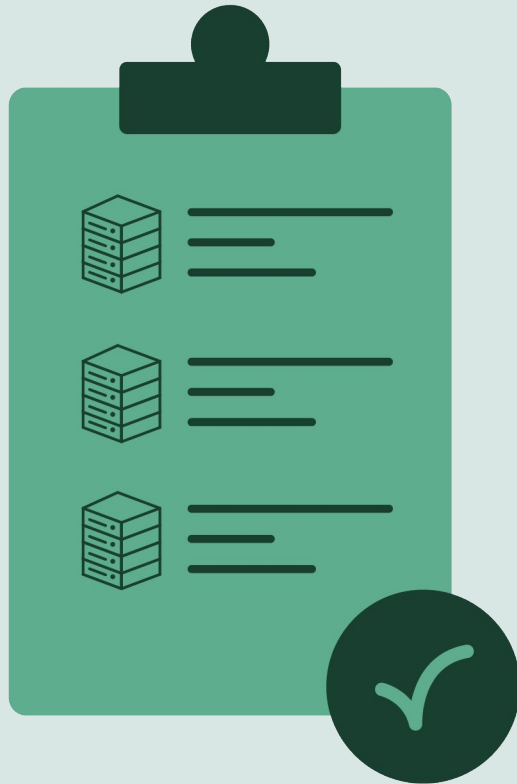
Google definition: “achieve maximum productivity with minimum wasted effort or expense.”



At MIRO, we consider efficiency as:

- How efficient we can fulfill our data reporting responsibilities
- How effectively we can improve **data accessibility**; provide more **actionable data**; and promote a campuswide **data-informed decision culture**

Laundry List Approach



Processes data
requests one at a time

Repetitive work causes:

- ⚙️ Negotiations about priorities
- ⚙️ Stress & burnout
- ⚙️ A hierarchical data support system

Not sustainable & not productive

Systematic Thinking



- ⚙️ **80/20 rule:** Roughly 80% of consequences come from 20% of the causes.
- ⚙️ **“System-thinking” mindset:** systematically address IR bottleneck issues and provides consistent and standardized data support to a large audience.

Prepare to Address Bottleneck Issues

- ⚙ Visit offices to identify their data needs
- ⚙ Data accessibility as common data challenge
- ⚙ Rewrite mission statement and create short/long term goals
- ⚙ Gain buy-in for office restructuring work for efficiency.



An Upward Spiral

Higher IR efficiency



More time saved for more initiatives

The diagram features a thick, teal-colored spiral that starts at the bottom and winds upwards and to the left. It has three distinct loops. At the top of the spiral, it points towards the text 'Higher IR efficiency'. Along the right side of the spiral, there are three gear icons, each followed by a text block. At the bottom of the spiral, it points towards the text 'Start to restructure IR office'.

More bottleneck issues solved
and more process streamlined

Early achievements saved time

Start to restructure IR office

IR Bottleneck Issue 1: Data Methods

It **occurs** when they are not clearly defined or well documented



Often **results** in a lot of guessing & attempts to match number reported in the past

MIRO's Approach: Clarify Data Definition and Calculation

Glossary

Our MIRO Glossary of Terms features words commonly used in the field of Institutional Research, as well as terminology used in reports developed by Mānoa Institutional Research Office. If there is a definition you feel we've missed or something you think we could explain a little bit better, please email us at miro@hawaii.edu.

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Index of Acronyms

MIRO Mānoa Institutional Research Office (Institutional Research Office at UH Mānoa)

IRAPO Institutional Research, Analysis and Planning Office (Institutional Research Office at UH system)

IPEDS The Integrated Postsecondary Education Data System

NCES National Center for Education Statistics

AIR Association of Institutional Research

CDS Common Data Set

FTE Full-time Equivalent

SSH Student Semester Hour

CIP Classification of Instructional Programs

GPA Grade Point Average

NSSE National Survey of Student Engagement



⚙️ **Industry** data knowledge:
- IPEDS and Common Data Set

⚙️ **Local** data knowledge:
- How data is defined and structured in the **university's** database
- How data is collected and processed by **different** offices

⚙️ Collaborate with data users and colleagues who have local data knowledge to create new data calculation methods.

MIRO's Approach: Organize & Document Data Methods

Externally: Use MIRO office website & decision support system

Internally: Use Confluence & Bitbucket



Video Tutorial

Learn how to use apps



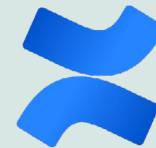
New User Guide

Must-read for new users

Analysis Briefs

? Report Help

Web App Documentation



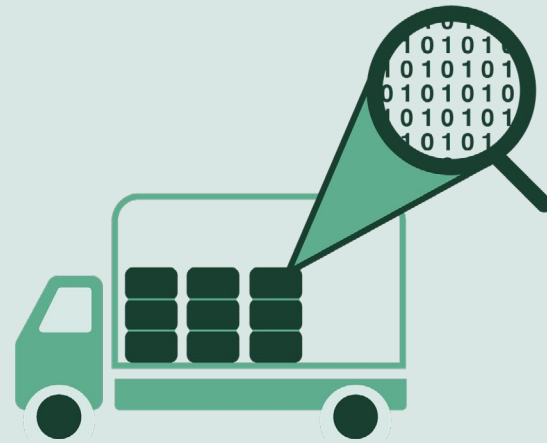
Confluence



BitBucket

IR Bottleneck Issue 2: Data Extraction & Preparation

It **occurs** when data is not readily prepared for reporting



Results in repetitive work in data extraction and preparation before IR can conduct any analysis

MIRO's Approach: IR's Solution



Download & transform data to meet reporting needs using SPSS and Excel

Helpful but not enough

Need to go beyond the typical IR analysis skills and include IT programming and computing

MIRO's Approach: IT solution



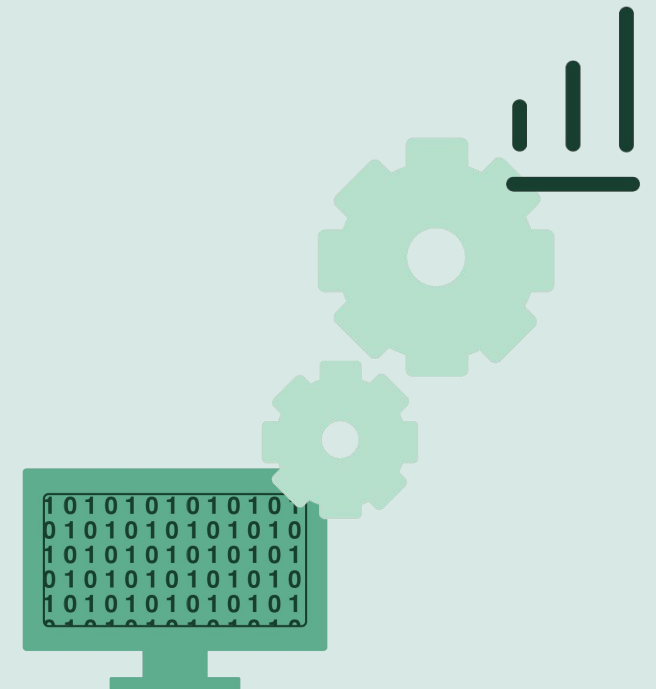
- ⚙ Created an in-house IT specialist position
- ⚙ Use Programming to transform work processes and “scale up” IR production

Scaling up



MIRO's Approach: Linking IR & IT

- ⚙️ Benefits of having an in-house IT specialist
 - prioritize IR office's needs
 - gain IR data knowledge to help advance IR's work
- ⚙️ IR/IT collaboration



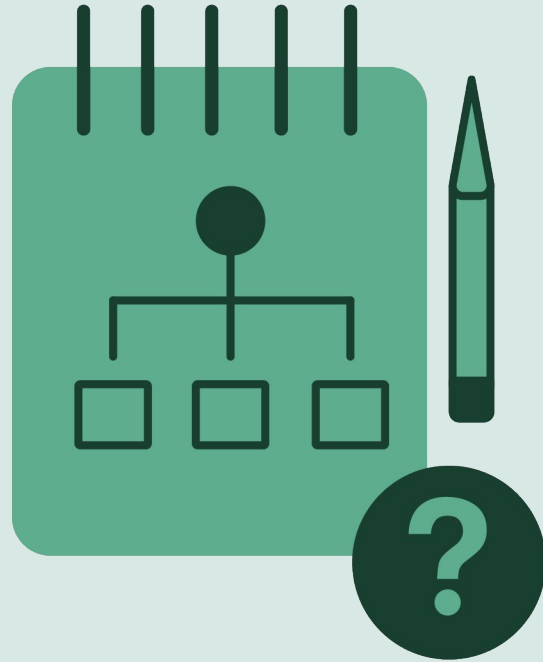


Kelly Lin

Institutional Research Analyst

8 years at MIRO

Challenges For IR



Use different software

- Time-consuming
- Easy to have errors
- Hard to identify and fix errors

Getting Started

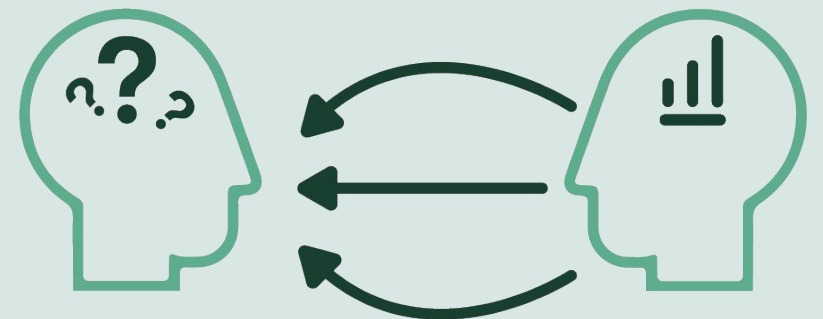
- Witnessed the power of programming
- Start with a simple SQL query from the IT specialist
- Use free SQL online resources



Structured Query Language, SQL

Learn More Complex Queries

- Learn more complex queries from IT specialist
- Building up programming knowledge from **real-life cases**
- Highly motivated in learning after seeing improvements at work



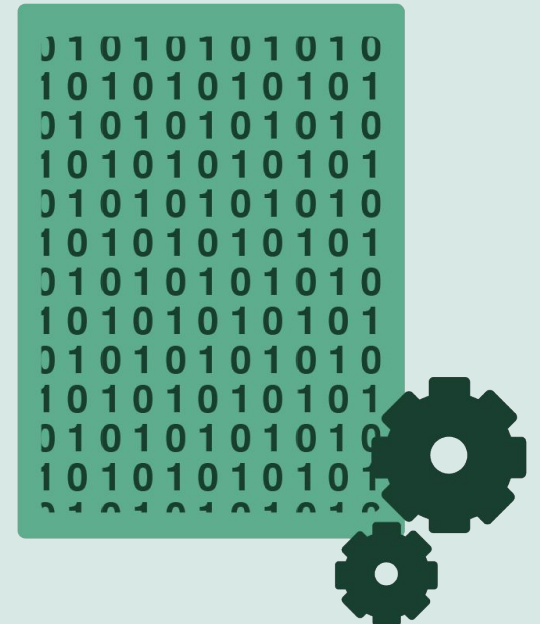
Taking Online Courses

- Take SQL online course at **Udemy**
- Replay the videos until fully understand the content
- Start to **write simple queries**
- Data validation



Applying Programming Skills in CDS Reporting

- Write SQL queries to consolidate data extracting, converting, and reporting processes
- Improve SQL queries to generate data in report ready format



Benefits of Learning Programming

- Explain data needs more efficiently
- Understand the queries IT write
- Speak confidently and effectively about data issues
- Save time from cutting repetitive work and improve quality of work
- Capacity to learning new skills



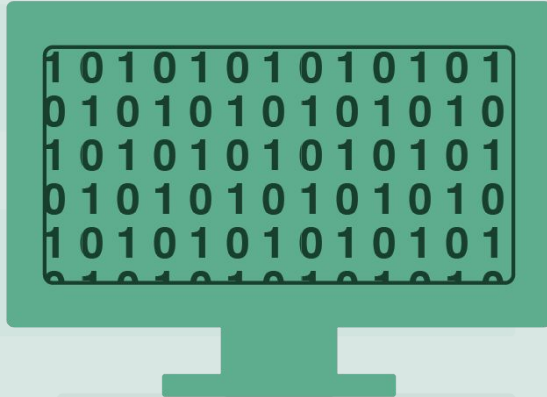


Bryson McFeeley

IT Specialist

4 years at MIRO

In-House IT Responsibilities in Data Management



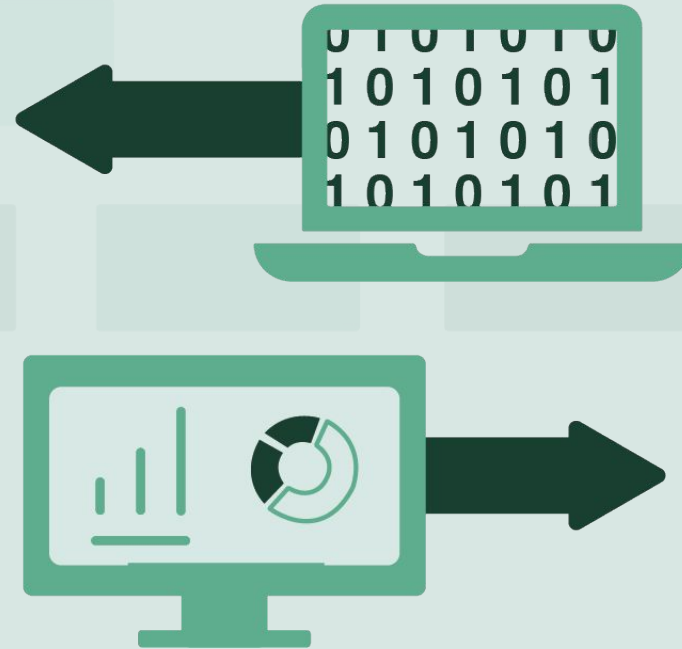
- ⚙️ Extract data from the university's official databases of record
- ⚙️ Clean and transform data to better suit IR office's needs
- ⚙️ Address new challenges stemming from increasing size and scope of database

Databases Become More Complex, Requiring Greater Care

- **New data variable** brings more complexity to the database structure and data transformation process
- Some data is **constantly changing** due to the change of the program and unit reorganization
- **More complex work**, more sophisticated procedures, and higher standards for both IR and IT specialists

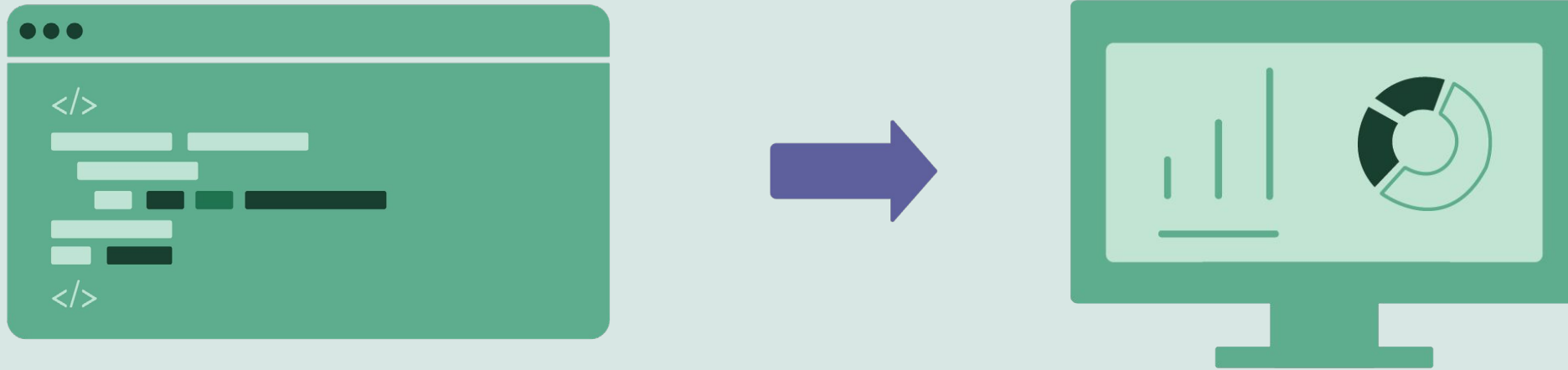


IR and IT Shared Knowledge



Crossover skills in programming & data analysis
increase work efficiency and improve communication

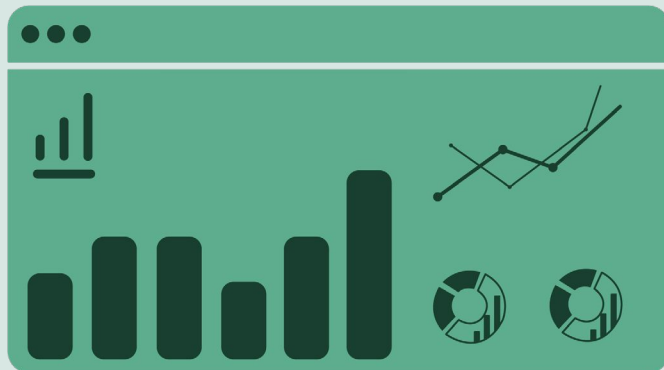
Creating Data Visualization Web Apps



- Creating data visualization web apps as a **team effort**
- Use **PHP** to process data and create web apps
- Updating existing **web apps** and creating new ones
- Rely on **data users** for continuous web app improvements

IR Bottleneck Issue 3: Data Reporting

It **occurs** when report templates are not available & repetitive formatting work is required



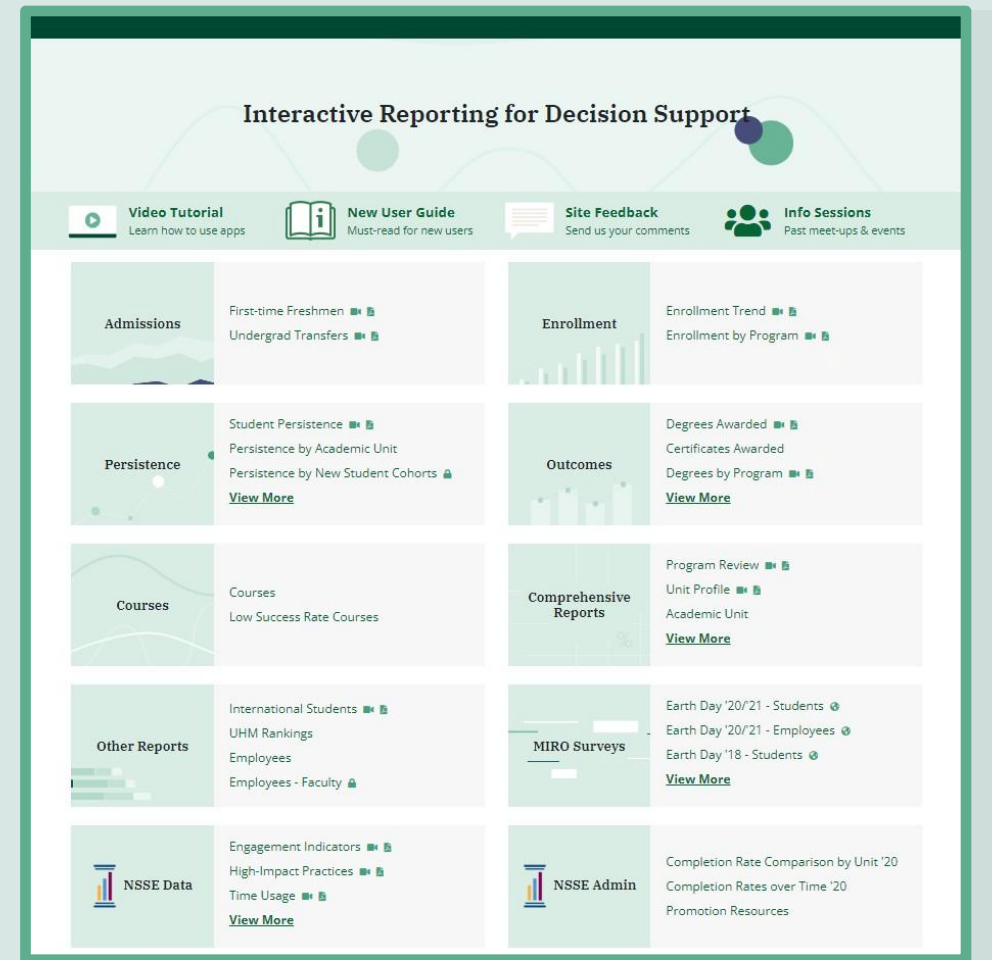
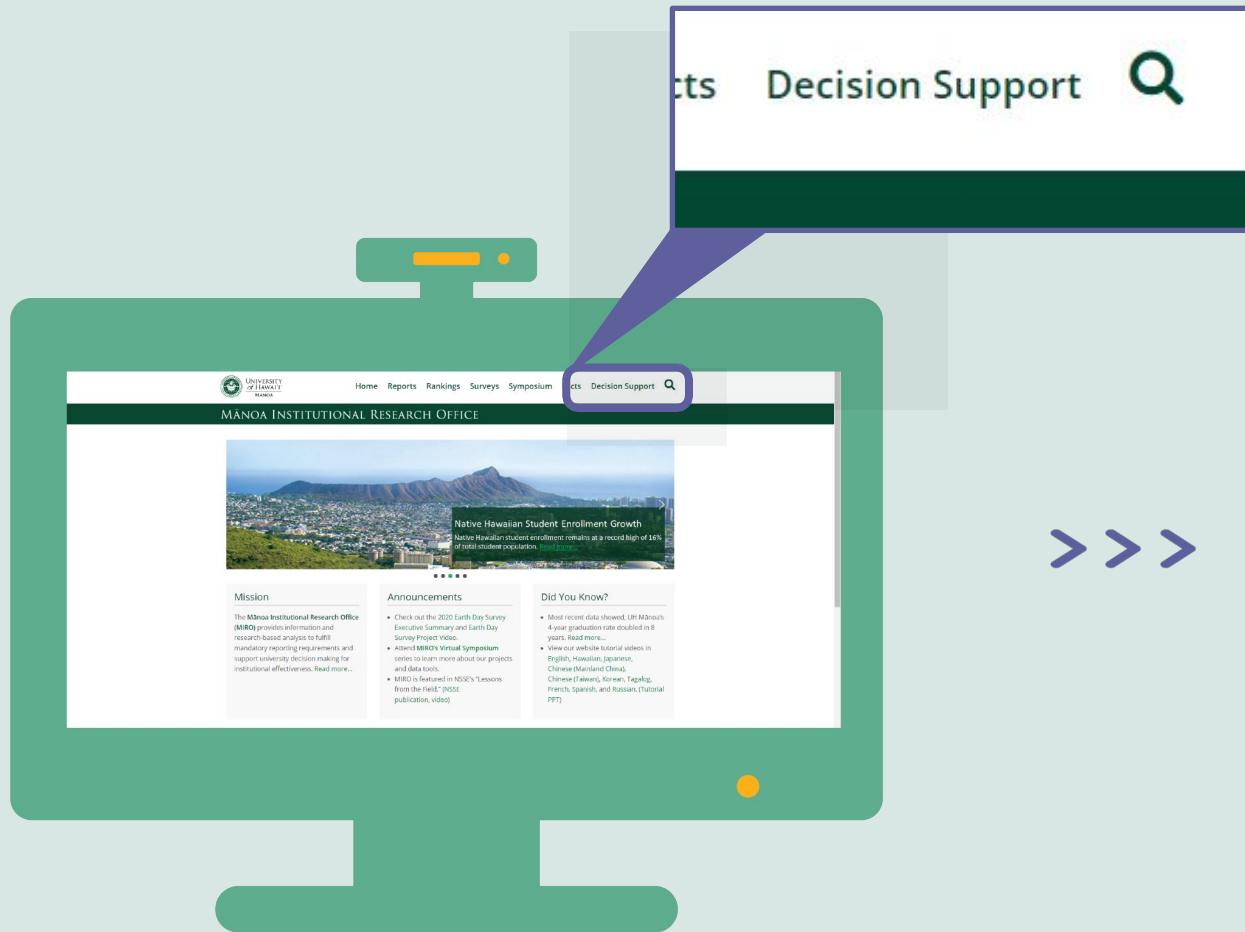
Results in repetitive & non-value added formatting work, and longer report turnaround time

In-house IT Service vs. Commercial Software Service

Practical reason: Funding & position

	In-house IT Specialist	Commercial software
Backend Work	Sophisticated data extraction, database management, accumulated data knowledge	Not Meant to conduct sophisticated backend data preparation work
Frontend Work	Great flexibility in adding and changing features, provide more data access	Less freedom to add features and change design

MIRO Web Apps & Decision Support System



MIRO Web App Flexibility

Report Options

By period ? ● Fall only ▼ Outreach Term ? ○ Fall Extension ▼ Freeze Event ? Census (Default) ▼

☐ Include second majors

☐ Show all historical data ?

☐ Show aggregates

FTE shown in bar chart is computed by: ● FT/PT status ○ Credit hours

Academic Status

Acad Level	Classified ?	Class Level (edlvl) ?	FT/PT ?	First-time ?	Start at Mānoa ?
--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲
Undergrad	Classified	Freshman	Full-time	Yes	Yes
Graduate	Unclassified	Sophomore	Part-time	No	No
		Junior			
		Senior			
		Post-Baccalaureate			

Reg Type ?	Transfer Type ? ●	Transfer Institution ? ○	Associates Awarded ?
--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲
New Student	UH 4-Year Campus	UH 4-Year Campus	AA
New Transfer	UH CC Campus	UH West O'ahu	AAS
Continuing	Hawai'i Private	UH Hilo	AS
Returning	Other USA & Related	UH Mānoa	ATS
Other	Foreign	UH CC Campus	None

Student Demographics

Geo Origin ?	Citizenship ?	Island ?	Hawai'i Area ?	Residency Status ?
--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲
Hawai'i		O'ahu		Resident
US Mainland		Hawai'i		Non-Resident Exempt
US National/CFAS		Kaua'i		WUE Exempt
International		Lāna'i		Pac. Islander Exempt
		Maui		Non-Resident

Open-Ended Filters

Numeric values only. Endpoints are inclusive. Leave one blank for an open-ended range.

Age ? From: To:

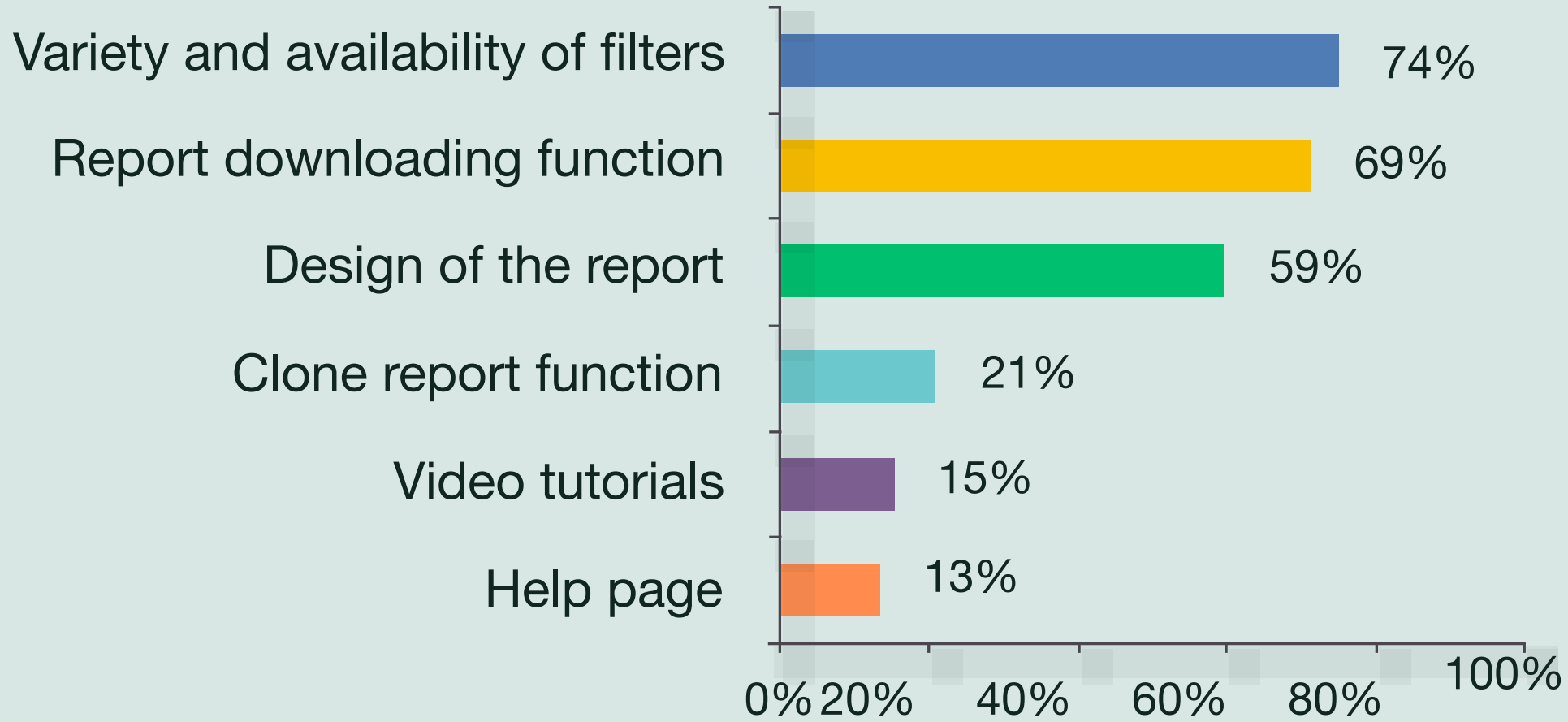
Student Sem Hours ? From: To:

Academic Program

College ?	Department ?	Degree Type ? ●	Degree ?
--- Any --- ▲	--- Any --- ▲	--- Any --- ▲	--- Any --- ▲
Academic Excellence	Academy for Creative Media	Bachelors	APCERT
Architecture	Accountancy	Masters	BA
Arts, Languages & Letters	American Studies	Professional Doctorate	BARCH
Business	Anatomy, Biochem & Physiology	Research Doctorate	BBA
Education	Anthropology	Post-Bac Certificates	BED
Engineering	Architecture		BENVD
Hawai'inuiākea	Art & Art History		BFA
Law	Asian Studies		BMUS
Medicine	Atmospheric Sciences		BS
Natural Sciences	Biochemistry		BSW
Nursing	Cell & Molecular Biology		DARCH

Major ?	Program ?
--- Any --- ▲	--- Any --- ▲
Accounting	Accounting-BBA
Advanced Library Info Science	Accounting-GCERT
Agricultural & Resource Econ	Accounting-MAcc
Agronomy & Soil Science	Adv Library & Info Sc-GCERT
American Studies	Agricultural & Resource Econ-PHD
Animal Sciences	Agronomy & Soil Science-MS
Anthropology	Agronomy & Soil Science-PhD
Architecture	American Studies-BA
Art	American Studies-MA
Art History	American Studies-PhD
Asian International Affairs	Animal Sciences-BS
Asian Studies	Animal Sciences-MS
Astronomy	Anthropology-BA
Astrophysics	Anthropology-MA
Athletic Training	Anthropology-PhD
Atmospheric Sciences	Architecture-BArch
Biochemistry	Architecture-DArch
Biological Engineering	Art History-MA
Biology	Art-BA

Most Helpful Web App Features According to USERS



User Feedback

I mainly use MIRO's web apps for looking at NSSE data results and open-ended student responses. I appreciate the thoughtful presentation of the data and the ability to disaggregate data by colleges, programs, and student characteristics. I appreciate the painstaking effort of MIRO to collect and analyze qualitative data and present them in a way that is useful yet allowing the audience to make our own interpretations.

I find MIRO web apps easy to use and quick to access for urgent data that needs to be found.

Many of the departments in my college ask me for data on enrollment, persistence, and graduation broken down by gender, ethnicity, geo origin, etc. The web apps provide a stable and reproducible repository of data that generate consistent data.

Use Our Own Web Apps for Data Reporting



UNIVERSITY of HAWAII MĀNOA

Home Reports Rankings Surveys Symposium Facts Decision Support

MĀNOA INSTITUTIONAL RESEARCH OFFICE

Enrollment

Mānoa Institutional Research Office (MIRO) develops a series of enrollment reports on total enrollment, undergraduate enrollment, and graduate enrollment at the University of Hawai'i at Mānoa.

Total Enrollment

Total Enrollment of [Fall Semesters](#) [Spring Semesters](#) [Summer Semesters](#)

*** Reports below are fall semester enrollment only include both degree-seeking and non degree-seeking students: ***

By Full-time/Part-time Status: [Full-time](#) [Part-time](#)

By Geographic Origin: [Hawaii](#) [US Mainland](#) [US National/CFAS](#) [International](#)

By Gender: [Female](#) [Male](#)

By Race:

Hispanic/Latino	Black or African American	Caucasian or White	American Indian or Alaska Native
Asian	Native Hawaiian or Other Pacific Islander	Multiracial	

By Ethnicity:

Japanese	Chinese	Filipino	Korean	Thai
Vietnamese	Laotian	Asian Indian	Other Asian	Mixed Asian
Native Hawaiian or Part-Hawaiian	Guamanian or Chamorro	Micronesian	Samoan	Tongan
Other Pacific Islander	Mixed Pacific Islander			

Note: Please refer to race and ethnicity report guidelines for more details about how racial and ethnic groups are reported at University of Hawai'i at Mānoa.

By College/Department:

Fall 2021	Fall 2020	Fall 2019	Fall 2018	Fall 2017	Fall 2016	Fall 2015	
Fall 2014	Fall 2013	Fall 2012	Fall 2011	Fall 2010	Fall 2009	Fall 2008	
Spring 2022	Spring 2021	Spring 2020	Spring 2019	Spring 2018	Spring 2017	Spring 2016	Spring 2015
Spring 2014	Spring 2013	Spring 2012	Spring 2011	Spring 2010	Spring 2009		

Undergraduate Students Enrollment

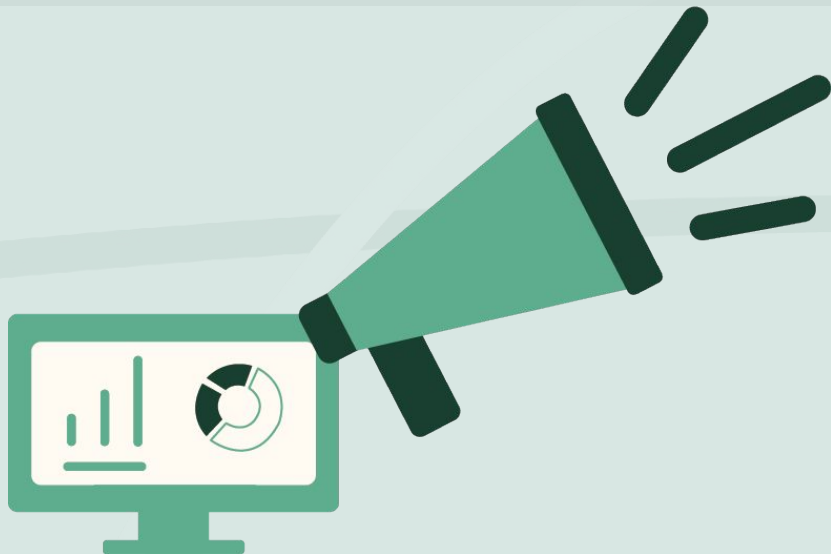
Graduate Students Enrollment

*Note: Data with a small sample size (i.e., less than 5 people on average) will not be reported.

IR Bottleneck Issue 4: Data Communication

It **occurs** when IR has to: 1) go back and forth with other offices in order to collect information; 2) clarify what data users need and later to help them understand data reported

Results in repetitive communication and distractions for both IR & others



Efficiently Collecting Data for CDS & External Surveys

- The **laundry list approach** generates massive amounts of email threads and cause constant distractions for both IR and other offices
- The **systematic approach** consolidates CDS and external survey questions and email communications with other offices

The streamlined process eliminates manual work and individual communication, lowers risk of human errors. and reduces distractions



Effective Communication Strategies

Glossary

Our MIRO Glossary of Terms features words commonly used in the field of Institutional Research, as well as terminology used in reports developed by Mānoa Institutional Research Office. If there is a definition you feel we've missed or something you think we could explain a little bit better, please email us at miro@hawaii.edu.

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Index of Acronyms

MIRO Mānoa Institutional Research Office (Institutional Research Office at UH Mānoa)

IRAPO Institutional Research, Analysis and Planning Office (Institutional Research Office at UH system)

IPEDS The Integrated Postsecondary Education Data System

NCES National Center for Education Statistics

AIR Association of Institutional Research

CDS Common Data Set

FTE Full-time Equivalent

SSH Student Semester Hour

CIP Classification of Instructional Programs

GPA Grade Point Average

NSSE National Survey of Student Engagement

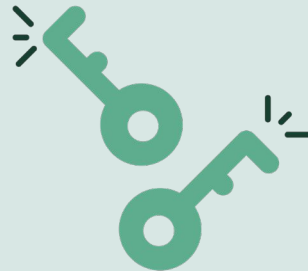


- Glossary of terms
- Web app help pages
- Analysis briefs
- Video Tutorials

- View our website tutorial videos in English, Hawaiian, Japanese, Chinese (Mainland China), Chinese (Taiwan), Korean, Tagalog, French, Spanish, and Russian. (Tutorial PPT)

IR Bottleneck Issues Summary

- Four IR data bottleneck issues: data methods, data extracting, data reporting, and data communication
- Systematically addressing IR bottleneck issues can:
 - Significantly reduce or eliminate repetitive work
 - Gain more consistency, convenience, and efficiency
 - Allows the IR team to learn new skills and continue to find creative solutions to better serve our campus



4 Essential Skills in a Highly Efficient IR Office

Data Analysis: the **core** function

Programming: **dynamic** & **powerful** support system

Multimedia: make ideas more **digestible** & **visually** appealing

Marketing: building and engage a wide **audience** group



4 Essential Skills in a Highly Efficient IR Office



Data Analysis

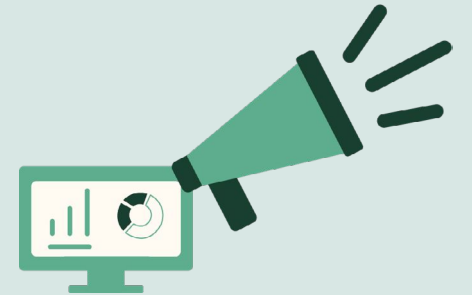
SQL, SPSS,
Excel, SurveyMonkey



Programming



Multimedia



Marketing

4 Essential Skills in a Highly Efficient IR Office



Data Analysis



Programming

SQL, PHP, HighCharts



Multimedia



Marketing

4 Essential Skills in a Highly Efficient IR Office



Data Analysis

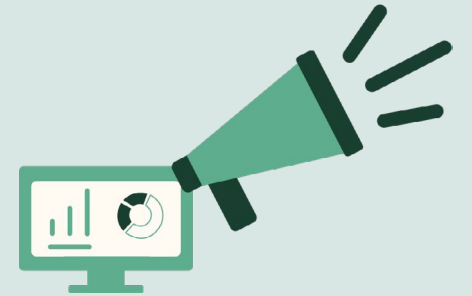


Programming



Multimedia

WordPress, InDesign, Canva,
Camtasia, iMovie, Zoom



Marketing

4 Essential Skills in a Highly Efficient IR Office



Data Analysis



Programming



Marketing

Mailchimp, Zoom
Webinar

Be Proactive Communicators, Forward Thinkers, and Courageous Leaders

- Say no to repetitive work
- Include non-traditional IR skills
- Create “easy buttons” for efficient solutions
- Use time saved time to do more meaningful and interesting projects



An Announcement



“It’s been a wonderful journey exchanging ideas with colleagues both on and beyond our campus through the virtual symposiums. Mahalo for supporting the MIRO office and our program. I hope our roads will cross again”

Yang Zhang, MIRO Director

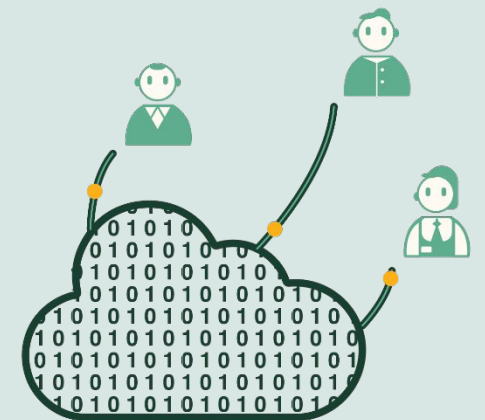
Final Reflection: Data is Power

- More access to data and analysis means more influence in decision making
- Balance of IR's time in serving different groups on campus
- MIRO aims to provide a more equal data access for all employees



Final Reflection: Data is Complicated

- Calculating a simple number involved many factors and decisions
- Data communication and education as an important aspect of the IR job
- Lacking understanding about data causes mistrust



Final Reflection: Data vs. Actionable Data

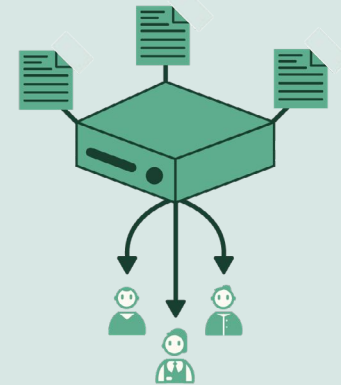
- Numbers can show us what the trend or the current situation looks like, but not “why” and how to make changes
- Non-actionable data is insufficient for decision making
- Qualitative data is more actionable
- Hearing real voices from students and motivates people to actions



Final Reflection: Data is a Double-Edged Sword

- A tendency to make large scale decisions that ignore individual experiences
- MIRO web apps purposefully avoided some comparisons
- Promote qualitative data that reflect real-life experiences and challenges

Pause and think





Mahalo for viewing!

Provided by the Manoa Institutional Research Office (MIRO)

