The challenges in projecting the future of Hawaii's workforce needs
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- The presentation will focus on predictive models designed by the DLIR Research and Statistics Office (R&S) for three of Hawaii's most essential industries: Health Care, Agriculture and Energy. In this workshop, the researcher will share the data R&S collects about jobs, employment, industries, and occupations, and the methods used to best predict the future of Hawaii's labor market and the economy as a whole.

- The predictive models for these three industries served as a case study to better understand the long and complicated process of collecting and analyzing data, as well as the importance of using data from a variety of sources. You will learn about the factors that have an effect on the number of jobs in these industries. The presentation could be useful in providing guidance to students and their teachers or counselors on how to make more informed career choices.
Presentation Focus Areas

- Predictive Models
- 3 Industries: A Project for UHCC System
- Data collected by R&S (jobs, employment, industries, occupations)
- Factors
- Guidance to students
What are the methods used to project employment levels?

- Time series employment data
- Detecting patterns
- Events with a significant effect on employment levels
- Changes in industry coding
What are time series employment data?

- Employment levels by Industry per month
- Business establishments classified by industry using NAICS codes
- NAICS (North American Industry Classification System) is used to collect and analyze statistical data by industry
- Business units are classified by the Research & Statistics Office (Labor Force Research)
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<th>Sector</th>
<th>Description</th>
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<td>81</td>
<td>Other Services (except Public Administration)</td>
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<td>92</td>
<td>Public Administration</td>
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NAICS codes subsectors

Health Care (62)

Ambulatory Services (621)

Hospitals (622)

Physicians (6211)

Dentists (6212)
Factors that affect employment

- BLS List of variables
- Economic climate
- Job growth in related industries
- Government initiatives
- New factors not reflected in data
Occupational Projections

- Occupations are categorized by using the Standard Occupational Classification System (SOC)
- Classification is done by the Research & Statistics Office (Occupational Employment Statistics)
SOC Major Groups

2010 SOC Major Groups
Each occupation in the SOC is placed within one of these 23 major groups:

11-0000 Management Occupations
13-0000 Business and Financial Operations Occupations
15-0000 Computer and Mathematical Occupations
17-0000 Architecture and Engineering Occupations
19-0000 Life, Physical, and Social Science Occupations
21-0000 Community and Social Services Occupations
23-0000 Legal Occupations
25-0000 Education, Training, and Library Occupations
27-0000 Arts, Design, Entertainment, Sports, and Media Occupations
29-0000 Healthcare Practitioners and Technical Occupations
31-0000 Healthcare Support Occupations
33-0000 Protective Service Occupations
35-0000 Food Preparation and Serving Related Occupations
37-0000 Building and Grounds Cleaning and Maintenance Occupations
39-0000 Personal Care and Service Occupations
41-0000 Sales and Related Occupations
43-0000 Office and Administrative Support Occupations
45-0000 Farming, Fishing, and Forestry Occupations
47-0000 Construction and Extraction Occupations
49-0000 Installation, Maintenance, and Repair Occupations
51-0000 Production Occupations
53-0000 Transportation and Material Moving Occupations
55-0000 Military Specific Occupations
SOC Subcategories

11-0000 Management Occupations
11-1000 Top Executives
   11-1010 Chief Executives
      11-1011 Chief Executives
   11-1020 General and Operations Managers
      11-1021 General and Operations Managers
   11-1030 Legislators
      11-1031 Legislators

11-2000 Advertising, Marketing, Promotions, Public Relations, and Sales Managers
   11-2010 Advertising and Promotions Managers
      11-2011 Advertising and Promotions Managers
   11-2020 Marketing and Sales Managers
      11-2021 Marketing Managers
      11-2022 Sales Managers
   11-2030 Public Relations and Fundraising Managers
      11-2031 Public Relations and Fundraising Managers

11-3000 Operations Specialties Managers
   11-3010 Administrative Services Managers
      11-3011 Administrative Services Managers
   11-3020 Computer and Information Systems Managers
      11-3021 Computer and Information Systems Managers
How to use NAICS and SOC codes to do Occupational Projections

- Each NAICS subsector has workers in various occupation groups
- By finding the subsector’s staffing pattern (the proportion of workers by occupation), occupational projections can be made
How to use NAICS and SOC codes to do Occupational Projections

Diagram:
- Industry Subsector
- Various Occupations
- Subsector Staffing Pattern
- Occupational Projections
How to approach the three industry project

- BLS Guidelines are very useful in building credible predictive models
- Methods that have been tested and tried in the past
- Researching similar projects is also very important
Issues that require a novel approach

*How to predict employment in sectors such as Energy that are not categorized by NAICS?*

By finding subsectors that

I) Play a prominent role in the industry,

II) Have a large number of workers, and

III) Are expected to play a greater role in the future
Three Industries: Health Care

- Steady growth over time makes predictions easier (Note: Ambulatory Health Care Services is a Health Care Subsector)
Three Industries: Agriculture

- Regression models tell us that the loss of jobs will continue in the future
- Is this true? Can we rely only on statistical data to predict the future?
- This is an example of an industry where more factors need to be taken into account
Three Industries: Energy

- *What subsectors to examine?*
- The Energy sector includes a variety of subsectors: Utilities, Natural resource extraction, Renewable energy etc.
- Mature subsectors may have many new jobs or replacements in absolute numbers
- Emerging subsectors may have new occupations
The Renewable Energy sector has the most potential. Obstacles need to be overcome for the sector’s further development. There is much uncertainty regarding the future. The need for renewable energy is urgent.
Lack of Data

- New variables that we may not be aware of
- Qualitative variables that cannot be translated to numbers
- Lack of historical data
Changes in Staffing Patterns

- New occupations emerge
- Some jobs become obsolete due to technology
- Others are created by technology
- New skills may be required
- Work environment becomes more green
Challenges and Tools

- Lack of necessary data and changes in the labor market make projections difficult
- Support from BLS and a national network of research agencies provides expertise and a stronger understanding of the market
The importance of Labor data to educators and students

- Guidance in developing a curriculum
- Historical data that provide a clearer picture of job growth patterns overtime
- An understanding of industry development and job growth
- Where the jobs are and what is needed to perform them
Questions?

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