**INFM 600**

**Information Environments**

**Final Project Summary Report**

**Career Projection**

**Team 3**

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8. **Introduction**

Team 3 developed an interactive information service for iSchool students that merged currently offered courses with real-time employment and wage information, giving students an edge when choosing courses to best support their burgeoning careers.

1. **Project Vision**

Team 3’s early brainstorming produced a wide range of futuristic ideas that could support students as they discover their interests and talents and seek to match those skills with the job market. Encouraged to narrow their vision to something more specific and achievable, the team zeroed in on developing a resource to help students put themselves on a bright career path.

The resulting information service directly connects courses currently offered in the University of Maryland College Park’s iSchool to the most up-to-date employment, wage, and job forecast data available.

This service helps students understand whether their choices in school will truly prepare them for work in the “real world.” Students can get a realistic picture of how they will fare amid changing economic conditions projected over the coming decade. Students interested in a specific career can backward map their work interest to the courses that will best help them achieve their goals.

This service fills a gap between higher education and the labor market identified by The Aspen Institute, which has studied the need for more information about the returns on costly higher education and the need for colleges to make better use of labor market data and the outcomes for investment in a Bachelor’s degree.[[1]](#footnote-0)

1. **Data Discovery, Cleaning, Processing**

To develop their Career Projections information service, the team sought a list of courses recently and currently offered by the iSchool. The team cleaned the iSchool data set to remove courses no longer on offer, as well as course numbers without content (such as independent study).

The team separately investigated data produced by the U.S. Bureau of Labor Statistics (BLS) to understand available labor market information. After reviewing the available BLS data, the team chose to use two BLS resources: Occupational and Wage Estimates and Occupational Projections. The team downloaded and narrowed those data sets to focus on occupations that overlapped iSchool course work, specifically computer and mathematical occupations, and educational instruction and library occupations. (See the Appendix for all documents available related to BLS data.)

All the collected data was cleaned by getting rid of unnecessary feature datasets that were merged with each other to create a comprehensive data source that can be used for data visualization. Cleaning included working with data types and correcting them as per requirements and also filling in the null and missing values with appropriate techniques.

1. **Project Development**

Once the data sources had been identified, Team 3 worked together to discover the added value that the Career Projection service could create for students. The team analyzed the BLS employment data to extract information that would be most useful to students trying to understand the near and future job prospects for their chosen course of study.

In this analysis, the team analyzed columnar data in the BLS reports and extracted high value data that illustrated:

* Highest job growth by total numbers of jobs
* Highest job growth by projected new openings
* Highest paying jobs by median salary
* Highest paying jobs by percentiles
* Typical education required for each occupation
* Self-employment trends

To connect the employment data to the iSchool courses, the team divided up the course offerings and manually matched the courses with occupations in the mathematical, computer, and library categories.

1. **Information System Prototype**
   1. [**Career Projections**](https://public.tableau.com/profile/gaurav.hasija5250#!/vizhome/CareerProjections/JobTitleVSMedianAnnualWage?publish=yes)**: An Interactive Tableau System**

To illustrate the value of combining these data sources, the team developed a set of Tableau reports that allows students to explore information about their future career landscape in connection with available courses. (See Appendix for reference to Tableau workbook available in GitHub.)

The Tableau system allows students to select, narrow, expand, and combine information to understand the career placement rates annually. The reports also break down and highlight specific career paths.

* 1. **Factors Affecting Occupations: A Visualization of Economic Forces Influencing Information Industry**

To illustrate how BLS data could help students understand the broader economic forces shaping information occupations in specific industries, the team developed visualizations of the BLS qualitative data that describe factors affecting occupations in the chosen areas. The visualizations illustrate the forces pushing job growth (such as the ever increasing threats of cyberattacks) or job contraction (such as outsourcing and automation). At a glance, students can see whether their chosen career has outside forces pressing for or against job growth. (See Appendix for reference to visualizations available in GitHub.)

1. **Path from Prototype to Implementation**
   1. **Requirements for Full Implementation**

If this information system were to be fully implemented, it would require enhancing and automating the processes that Team 3 did by hand. It would also require a more robust method for user access. Some ideal enhancements would include:

* A web-based framework to deliver the service
  + Automated access for students registered with a university’s single-sign-on or other credentialing system
* Automated data update from BLS
* Automated data update from iSchool courses
* Keyword matching or other algorithm to match occupational descriptions with iSchool course descriptions
* Wage and demand tracker for fluctuating job fields

Upon successful implementation for the iSchool, this service could be expanded across all university departments and the nearly 800 occupations covered by BLS data. This can serve as a reference tool for students that are determining specific career tracks and specializations. It could also boost the job matching rate for University of Maryland, College Park students.

* 1. **Embedding in the Environment**

This service is best delivered as a web-based, universally accessible, student-focused service. How this service can be incorporated into the iSchool is as a consulting appointment with an academic advisor or just with the student exploring their options on their own.

This service could electronically blend or merge the services of course selection (Testudo) and academic advising (uAchieve), serving both students and advisors. When a student wishes to register for their courses, they can consult with an advisor to discuss their desired career path while shaping their schedule. The user is able to navigate by looking at different courses that may interest them and contribute to their desired career. This could help prospective students decide where to start when joining a major, but especially when choosing electives tailored to a particular occupational goal.

More broadly, this service could be owned by a university department that works closely with career services and instructional design, returning value to the university’s own instructional planners. Such a department could blend the expertise and goals of UMD’s professionals at the [Teaching and Learning Transformation Center](https://tltc.umd.edu/) and the [Career Center](https://careers.umd.edu/).

1. **Appendix: Project Artifacts Available in GitHub**

Please find the following documents and supporting information in Team 3’s Project [GitHub Repository](https://github.com/ghasija1/INFM-600-Final-Project-Career-Projections):

1. Clean Data
   1. Course\_list from iSchool.xlsx
   2. Occupational Projections for Computer and Mathematical Occupations.xlsx
   3. Occupational Projections for Educational Instruction and Library Occupations.xlsx
   4. Occupational and Wage Estimates\_Computer and Mathematical.xlsx
   5. Occupational and Wage Estimates\_Education and Library.xlsx
2. Literature Review
   1. Literature: ED541431.pdf - “A Guide for Using Labor Market Data to Improve Student Success,” The Aspen Institute, College Excellence Program (2013).
   2. Literature: LaborMarketReturns\_0.pdf - “From College to Jobs: Making Sense of Labor Market Returns to Higher Education,” The Aspen Institute, College Excellence Program (2015).
3. Misc. Documents
   1. BLS Data Explainer
   2. Project Road-Map
4. Presentation
   1. INFM 600 Final Presentation
5. Project Proposal
   1. Team 3 Project Proposal
6. Project Report
   1. Team 3 Final Project Summary
   2. Visualization: \_Factors Affecting\_ Computer and Mathematical.pdf
   3. Visualization: \_Factors Affecting\_ Education and Library.pdf
7. Raw Data
   1. Data Dictionary: Field Descriptions for BLS Occupation and Wage Estimates files
   2. Data Source: BLS Factors Affecting Computer and Mathematical Occupations
   3. Data Source: BLS Factors Affecting Education and Library Occupations
   4. Data Source: BLS Full Descriptions: Computer and Mathematical Occupations
   5. Data Source: BLS Full Descriptions: Educational Instruction and Library Occupations
   6. Data Source: BLS Occupational and Wage Estimates: Computer and Mathematical
   7. Data Source: BLS Occupational and Wage Estimates: Education and Library
   8. Data Source: BLS Occupational Projections for Computer and Mathematical Occupations
   9. Data Source: BLS Occupational Projections for Educational Instructions and Library Occupations
   10. Data Source: Course Hist 201908-202007.xlsx
8. Tableau Workbook
   1. Career Projection Tableau Workbook

1. “A Guide for Using Labor Market Data to Improve Student Success,” The Aspen Institute, College Excellence Program, 2013. (documenta also available in project GitHub repository) [↑](#footnote-ref-0)