

# Jamaican Youth through Empowerment & Training Project

# JET



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# Jamaica's Digital Skills Indicator

While digital technologies are spreading rapidly, there continues to be a mismatch between education and industry which poses an ongoing challenge for the future of work. Higher education and vocational training programs and systems are not structured to respond in real-time to the shifting demands of private sector companies operating in the digital economy. The average lifespan of a learned skill is estimated to be five years and even shorter for technical skills, which means that a skill learned today will be about half as valuable in just five years or less. This is why in a context of rapid technological development and highly changing collaborative environments it is important to think about employability and upskilling strategies for a resilient labor market, placing people and the work they do at the center of the strategies employed.

*To address this, is the objective of the “Unleashing the Potential of Jamaican Youth through Empowerment & Training Project”, also called JET.*

By using real-time data to design educational curricula and training for low-income employed and under-employed Jamaican youths, facilitating their access to job opportunities in the digital economy. With the insights from the data analysis, we can identify the specific digital and soft skills of focus to develop in order for them to find employment, income, and entrepreneurial opportunities.

The project's objective is to leverage open-source data to create a model identifying labor market trends in Jamaica, with a view to rapid development and creation of relevant skill programs and be able to respond to real-time labor market needs. We use an Employment & Skills Monitor, to pinpoint trends, social insights, and leading indicators. The monitor is an AI platform specialized in the social understanding of citizens, created to work in the framework of the SDGs. Social understanding tools contextualize digital conversations and are geared toward interpreting real-time social changes, conversations, and public opinions with the purpose of positively impacting society. We have access to the traceability of the data, the accuracy of the attribution, and the veracity of the insights allowing us to check the performance metrics to improve data quality. We qualify quality data as representative, inclusive, timely, and transparent in its collection process. This helps us mitigate fairness and bias issues during the analysis process.

*This report contains scanning and analysis of local and global trends in digital skills for the Jamaican labor market, to assess public and private institutions in terms of youth training for their data-driven decision-making.*

The analysis can further support assessment for training models and curriculums used to prepare Jamaican youth (ages 17-34 years old) to transition the low-income workforce into knowledge economy-related jobs, as well as to support digital entrepreneurship activities. The main sectors of focus are those where the challenges and opportunities for innovation are greatest: tourism, manufacturing, and food processing, to name a few.

# The methodology

**Data Source and Collection:** The first step of this project was to identify the websites, social media platforms and job lists to be analyzed in order to identify labor market conditions, wanted skills, and job offer descriptions in Jamaica, remote opportunities and other similar markets in the Caribbean.

**The queries:** Defined and built the queries to be used for each data source to guarantee the relevance and quality of the data. These helped us analyze the data in real-time, collected from all available sources for over 12 months.

**The AI model:** Developed and adapted to the scope of the project, for searching and categorizing in real-time the information, that evolves with the conversations adapting to any language, dialect, or slang, including specifically the Jamaican patois.

**The Dashboards and Reports:** In order for the analyzed information to be translated into training and capacity building for the Jamaican labor force, we use dashboards with real-time analysis of the collected data from the defined sources. The dashboards filter the information by data source, gender, and intent. And with those dashboards, we are able to put together the reports with insights.

## Data Sources

**The tool uses datasets from different countries, such as:**

**Jamaica:** It includes all the information regarding digital skills in the context of labor, in the Jamaican territory.

The next datasets include all the information regarding digital skills in the context of labor, in its territory, focusing just in remote offers.

- *United States*
- *United Kingdom*
- *Antigua & Barbuda*
- *Bahamas*
- *Barbados Remote*
- *Dominica*
- *Saint Lucia*
- *Saint Vicent & the Grenadines*
- *Trinidad & Tobago*

The team worked on identifying economic sectors and digital skills, that we could use as main sources of digital information and data about the labor market and digital skills that impact Jamaica at different scales. For this dataset, ten (10) different categories are used for the analysis. Each category englobes topics related to it. The categories and their seeds (what each category includes) are listed below:

**The tool uses datasets from different countries, such as:**

### **Digital foundation skills**

Access the internet; basic IT; basic digital; connect to the internet; turn on a device; connect to wifi; connect to wi-fi; connecting to wifi; connecting to wi-fi; wifi connection; wi-fi connection; keep password safe; use a touch screen; use a mouse; use a keyboard; operating system; operating systems; basic functions.

### **Software Management**

Microsoft word; processing software; microsoft office; office suites; office suite; spreadsheet; outlook; word processor; google docs; powerpoint; presentation software.

### **Social media**

Content creator; content creation; social media manager; social media strategist; content moderator; head of social media; content moderation; content executive; social media executive; digital content; social media specialist; content specialist; social media consultant; community manager; social media assistant; social media creator; social media planner.

### **Data analytics**

Big data; data visualization; data cleaning; data analysis; data analyst; data mining; dataset; datasets; data management; knowledge discovery; statistical modelling.

### **Programming, Web and App Development**

Python; matlab; developer; programmer; programmers; programming; javascript; app developer; software developer; Web developer; coding; synthax; C language; C++; C#; R language; Kotlin; Go language; Scala; Rust language; PHP; app development; software development; web development; API; coder; coders.

### **Digital image and video editing**

Video editing; Digital image; image processing; image manipulation; digital photo; digital photography; airbrush; retouch; retouching; graphic software; digital video; cropping; editing software; photoshop; lightworks; shotcut; openshot; image enhancement; photolab; video processing; lightroom; adobe premiere; digital media.



## **Digital Business**

Digital business; e-commerce; digital marketing; search engine optimization; web positioning; cost per click; customer acquisition; customer experience; e-business; e-marketing; click-through rate; content marketing; content strategy; conversion rate; optimization; customer journey; digital enterprise; marketing automation; digital strategy; product owner; startup; entrepreneur.

## **Cybersecurity**

Cybersecurity; virus; viruses; firewall; firewalls; password; IT security; passwords; malware; crimeware; spyware; hacker; hacked; hacking; hackers; antivirus; antiviruses; data breach; email fraud; cybercrime; cyberterrorism; phishing; spoofing; digital attack; attack vector; data theft; denial of service; encryption; ransomware; spam; anti-virus; cloud storage.

## **Design**

Graphic design; prototype; prototyping; UX design; graphic designer; visual design; web design; user interface; user experience; design.

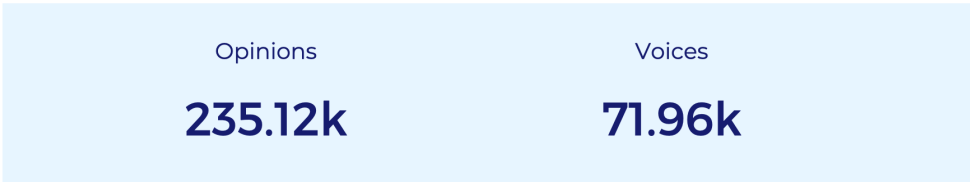
## **Artificial Intelligence**

Machine learning; artificial intelligence; algorithm; algorithms; virtual reality; augmented reality; automation; automated; robotics; robots; robot; cluster analysis; deep learning; game theory; supervised learning.

The categories have been defined as topics of interest by subject-matter experts, as well as through a bottom-up analysis of the data. Data is categorized automatically, with human quality controls.

# Demographic indicators

The monitor is represented by

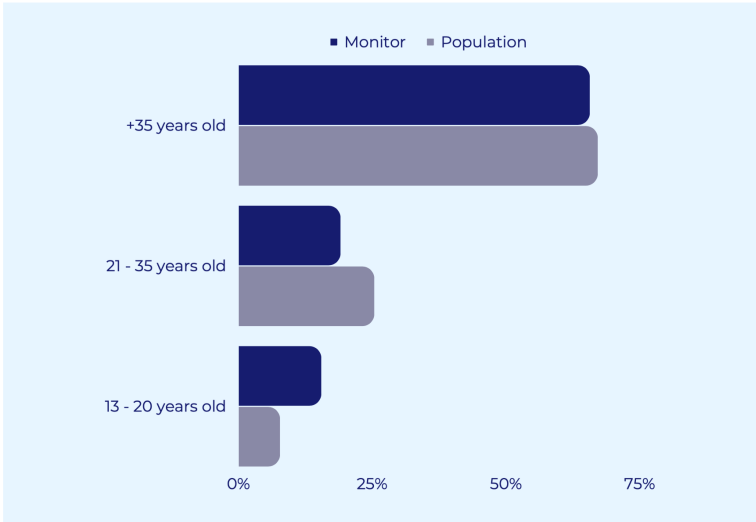


Total number of analysed documents and authors in the selected location and time period.

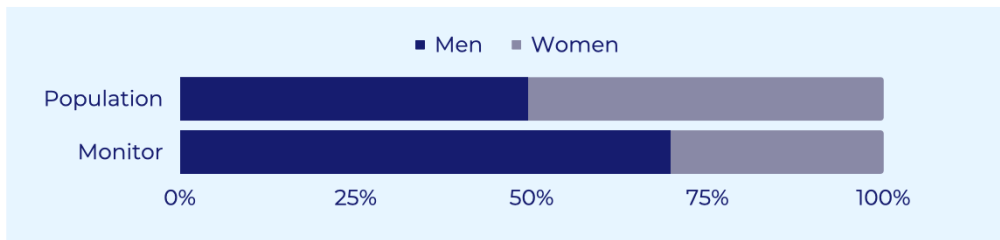
## Data Source and Collection:

The first step of this project was to identify the websites, social comparison of the percentage of male and female, in the selected location and time period. The tool recognizes that female and male are not the only genders, and the data is calculated using the gender profiling algorithm in the documents with detected demographics. For the comparison of the percentage of age groups, data is calculated using the age profiling algorithm in the documents with detected demographics. The data from the total population by age comes from United Nations, Department of Economic and Social Affairs, Population Division (2022). Lastly, there is also the demographics of representation between institutions and citizen voices.

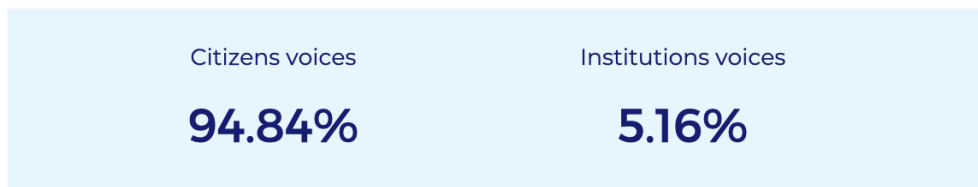
Age profiling



## Gender profiling



## The monitor is composed by



Percentage of opinions coming from citizens and institutions, based on the number of documenta in which this information is available

## Countries and languages



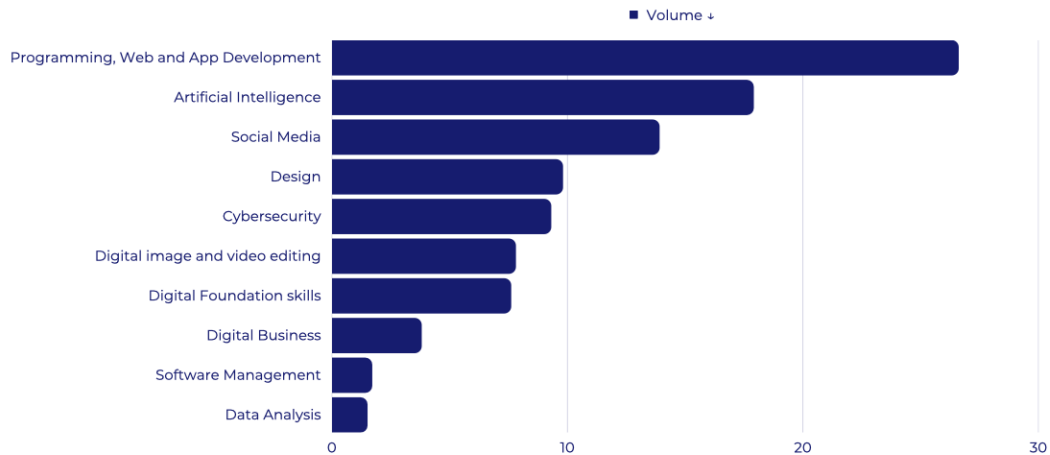
Total number of languages and countries analysed.

# Jamaica's Digital Skills



To begin the analysis, we will look at the Employment and Skills Monitor, which provides real-time insights into citizens' needs, opinions, and concerns around societal changes and challenges, such as the ones faced by the job market. We will begin by understanding which aspects are of greatest concern in Jamaica, and identifying trends, by detecting growing conversations in the monitor. The graph below gathers data from July 2021 to January 2023 and helps to visualize the main trending' s in Jamaica. With respect to this, the main trends were ranked as follows: Programming, Web and App development (26.6%), Artificial Intelligence (17.9%) and Social Media (13.9%).

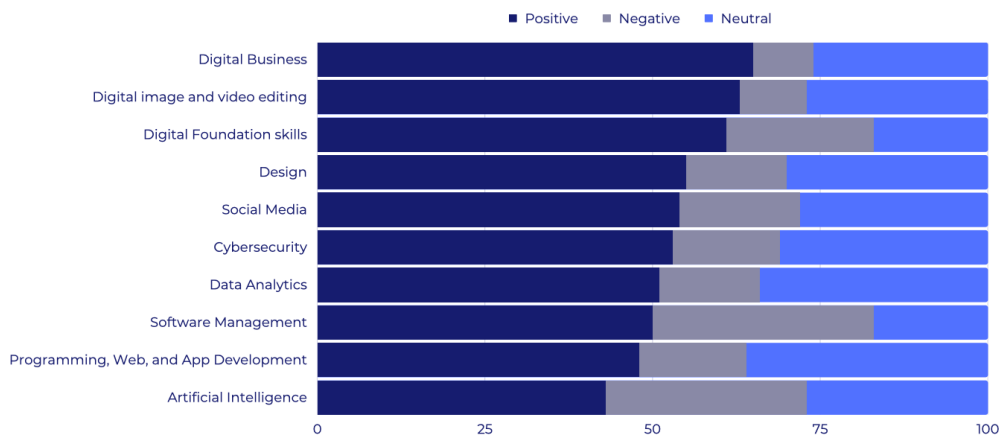
## Digital needs in Jamaica



Source: Digital Skills Monitor. Data collected from: Jul 1,2021 to Jan 31, 2023. Downloaded: 06/02/2023. Powered by Citibeats.

To better understand the opinion of the voices gathered, we reviewed the data from a sentiment analysis perspective, which is used to determine whether a given text contains negative, positive, or neutral emotions. This helps us to visualize data, comparing the opinions and feelings that citizens shared on the datasets analyzed.

## Sentiment analysis



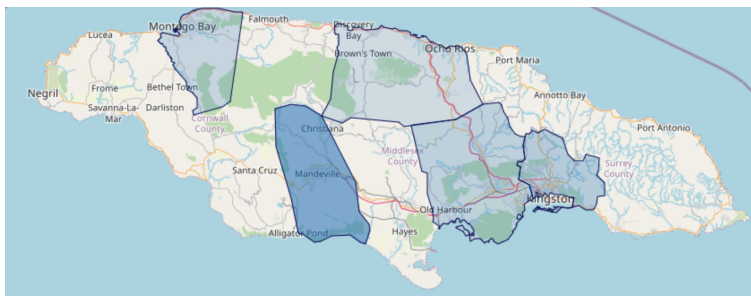
Source: Digital Skills Monitor. Data collected from: Jul 1,2021 to Jan 31, 2023. Downloaded: 06/02/2023. Powered by Citibeats.

Some of the great findings include that the most positive reaction is towards Digital Business (65.9%), followed by Digital Image and Video Editing (65.4%) and Digital Foundation Skills (64.6%).

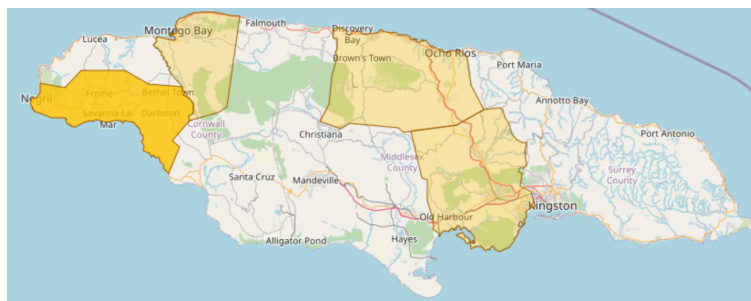
# Jamaica's subregional analysis

It is also important to look at trends, which allow us to anticipate future developments of the data. For the same period (July, 2021 - January, 2023), the top 3 categories for digital needs in Jamaica were analyzed from a parish perspective, to identify trends at the sub-regional level.

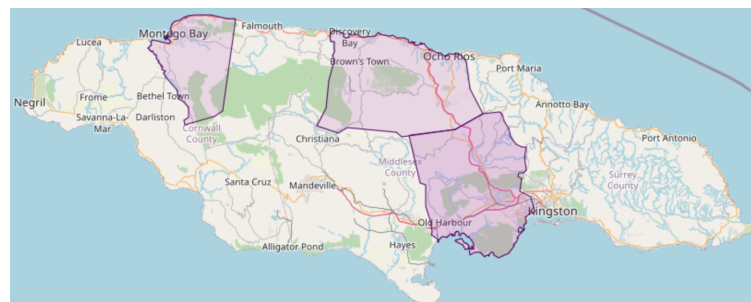
The graph below illustrates how the citizens of four of the 14 parishes in Jamaica - St. James, St. Ann, Manchester, St. Catherine, and St. Andrew- are mainly expressing training needs in Programming, Web and App Development.



Citizens in the sections of Westmoreland, St. James, St. Ann and St. Catherine, are rather highlighting training needs in Artificial Intelligence.



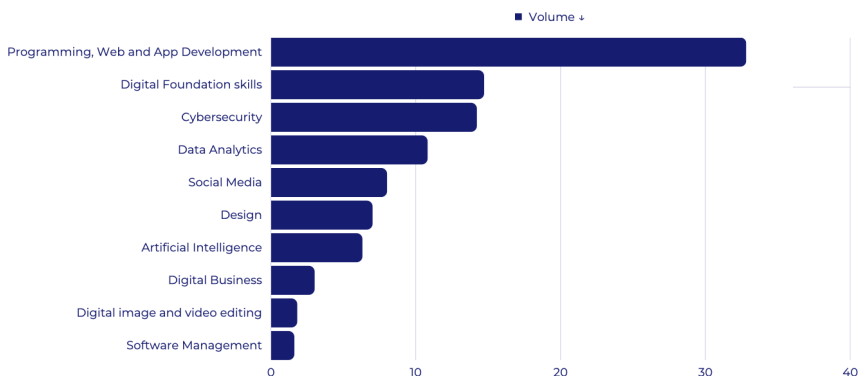
The distribution of the conversation on Social Media across the island is concentrated in small sections of St. James, St. Ann and St. Catherine.



# Skills by sector

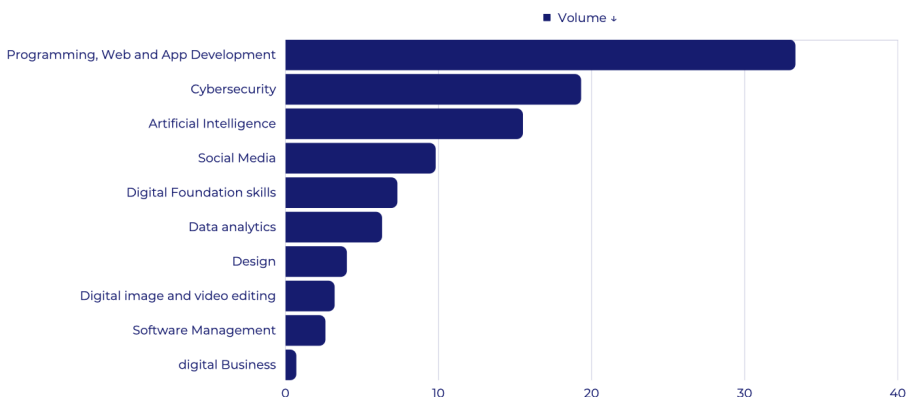
We analyzed the categories of digital skills in different economic sectors across datasets from all countries analyzed, to visualize which skills have a higher demand in each sector, according to the institution and citizen voices.

Starting with manufacturing, the trends in the sector revealed more conversations towards Programming, Web and App Development (32.8%) followed by Digital Foundation Skills (14.7%), and Cybersecurity (14.2%).



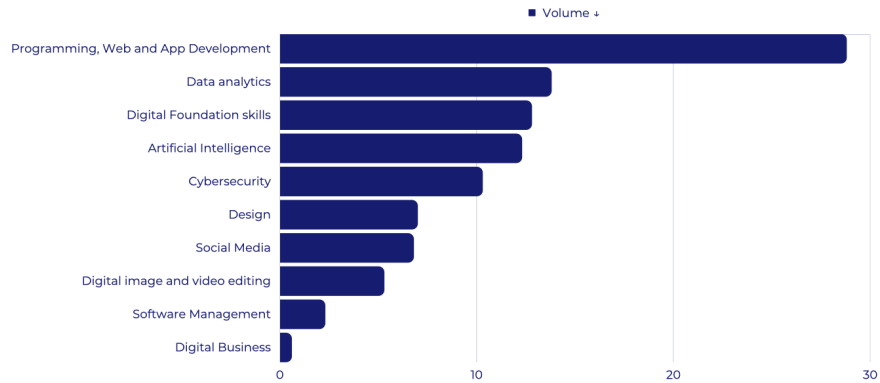
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

The Agriculture and Food Processing industry has its greatest trend in conversations around Programming, Web and App Development (31.7%) followed by Cybersecurity (19.1%) and Artificial Intelligence (15.5%).



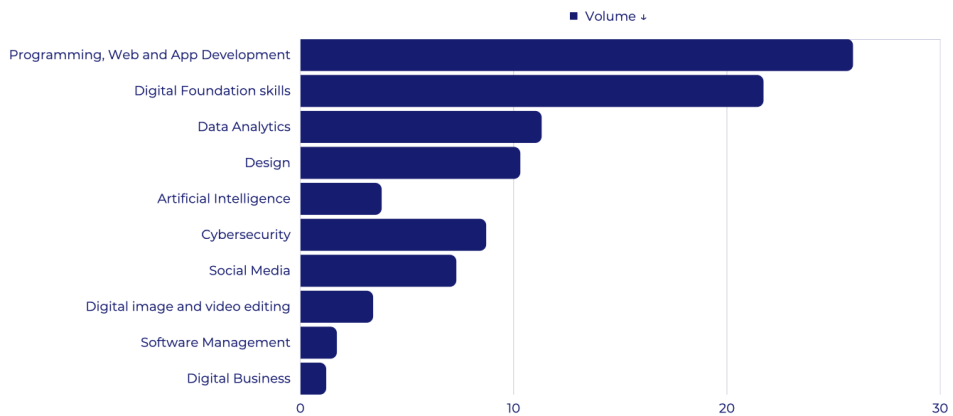
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

The Mining sector showed its greatest voices raised in Programming, Web and App Development (28.8%) followed by Data Analytics (13.8%) and Digital Foundation Skills (12.8%).



Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

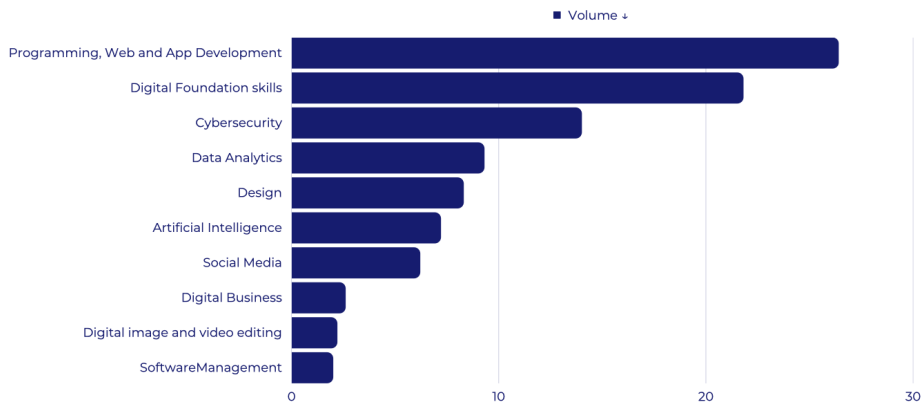
Trends in the Tourism sector revealed its greatest need in Programming, Web and App Development (25.9%) followed by Digital Foundation Skills (21.7%) and Data Analytics (11.2%).



Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

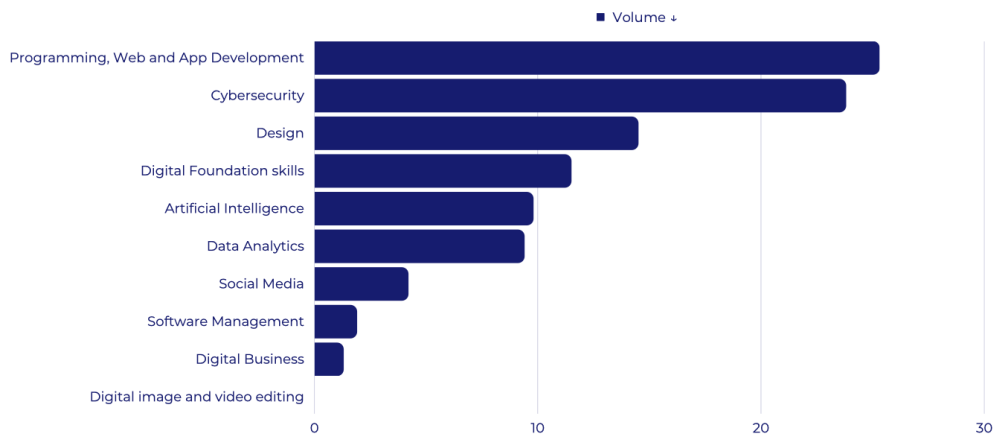
For the Trade and Logistics sector, Programming, Web and App Development (26.4%) followed by Digital Foundation Skills (21.8%) and Cybersecurity (14%).





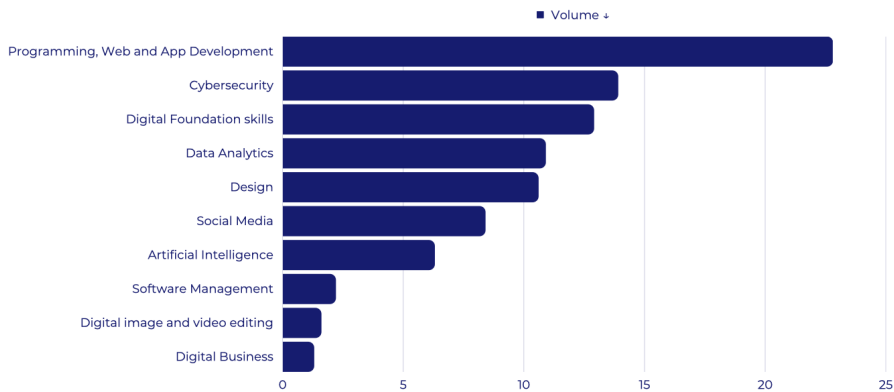
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

The Business Process Outsourcing and Global Digital Services sector has its greatest need in conversations involving also Programming, Web and App development (25.7%) followed by Cybersecurity (21.9%) and Design (14.3%).



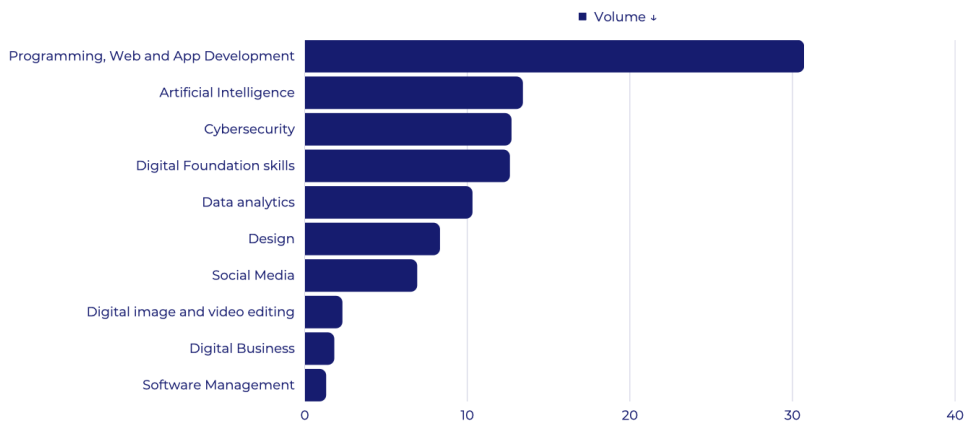
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

The greatest needs in the Energy sector are related to Programming, Web and App Development (32.8%) and Cybersecurity (13.9%) followed by Digital Foundation Skills (12.9%).



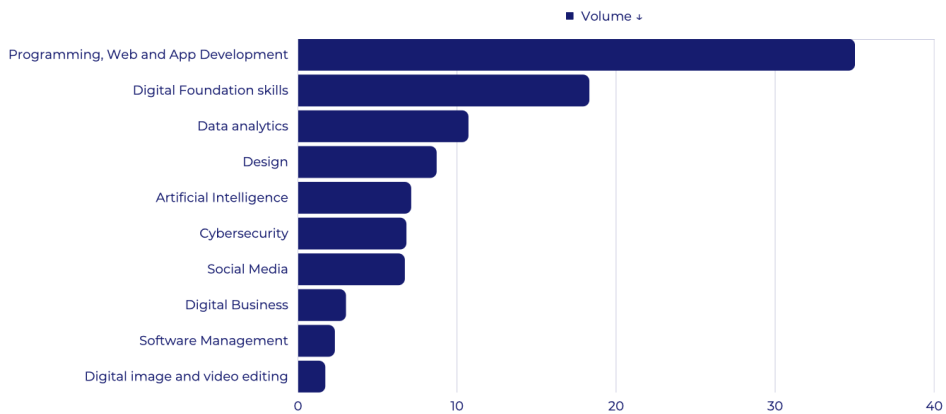
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

Finance industries demonstrated their greatest niche in trending conversation around Programming, Web and App Development (30.7%) and Artificial Intelligence (13.4%) followed by Cybersecurity (12.7%).



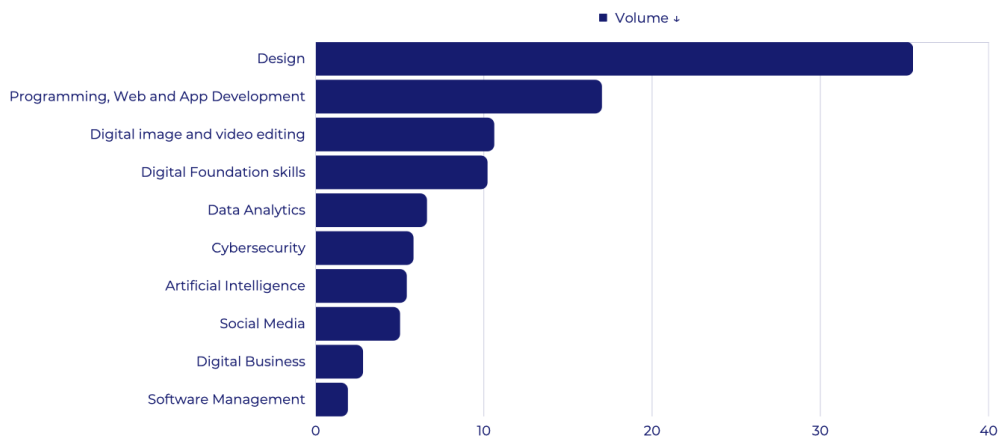
Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

In the Construction sector, it is distributed as follows, Programming, Web and App Development (35%) and Digital Foundation Skills (18.1%) followed by Data Analytics (10.7%).



Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

In the Creative sector, Design (35.5%) was the greatest need with Programming, Web and App Development (17%) and Digital image and video editing (10.6%) following in that order.



Source: Digital Skills Monitor. Downloaded: 06/02/2023. Powered by Citibeats.

The data sources used to collect the data are divided mainly into:

- **Web content: websites, news articles, blogs, Reddit, forums, etc.**
- **Twitter Enterprise.**
- **Facebook pages: Jamaica Labour Market Information System, Career Jamaica, Finding jobs for Jamaicans, Job Seekers/Employers (Jamaica), etc.**

To complement the information from these data sources, we added data from on-demand surveys. The online surveys included the following questions:

1. What do you consider to be the skills and abilities that are most sought after in young people to employ them, and why those?
2. In what ways could companies offer lifelong learning opportunities for their workers, and what is needed for it?
3. How can the adoption of new technologies in economic activities (such as the automation of activities or processes) be used to generate jobs?
4. How could efforts be linked between the public and private sectors, academia and civil society to strengthen an ecosystem of social, scientific and technological innovation that can generate better opportunities of professional growth for young people?
5. What could be improved in the link between higher education institutions and the private sector in your city to improve employment opportunities for young people?

Results from analyzing 200 responses, showed the following keywords most mentioned:



The respondents highlighted the need for improving the skills of young people, to help them access job opportunities with higher salaries, remote roles and better career opportunities.

*“Technology can help develop their skills. More young people will have better jobs, crime will decrease, and can lead to a better economy. Young people need to develop their skills to be able to become entrepreneurs too.”*

*“I would focus on information technology and software development skills because most of the jobs available use those skills, they are in high demand, and pay well. Also in most instances employees can work from home.”*

They also mentioned frequently the interest of youth in lifelong learning and environments that help them continue to develop their skills.

*“Young people are more interested in learning to become business owners than working a typical 9-5. They are leaning towards computer skills like coding and social media management.”*

*“Automated services offer more opportunities for remote work, full-time and part-time. Through automation the barrier of migrating to a particular country for specific jobs is reduced.”*

*“We can help people by exposing employees with various programs that may improve their functions in the workplace.”*

*“Investing financially in employees’ ongoing development is one of the best ways to encourage lifelong learning. So, think about creating a budget to reimburse employees for courses they take on their own time.”*

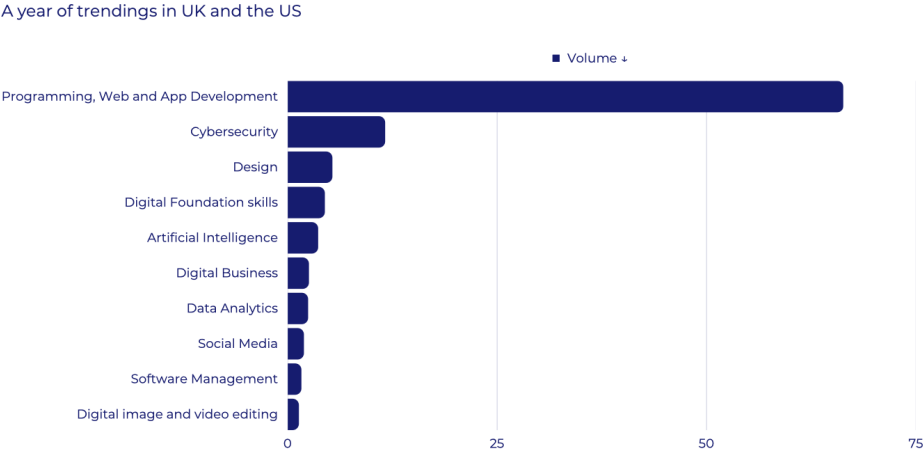
And the need to involve students in more practical experiences, considering vocational and career guidance.

*“All students should have access to not just the teaching of technology but also the exposure to scientific, engineering, logistics, and technological programs that ensure young people have experience, professional guidance, and are rewarded by improving their skillset.”*

*“Public sector, private, academic and civil society can strengthen opportunities for young people by investing in academic development of youth and informing young people about the process of career choice.”*

# From a Global Perspective

We have also collected data for countries with important Jamaican migrant communities to assess remote opportunities for Jamaican youth, including United States, United Kingdom and neighboring Caribbean countries, in order to identify other digital skills needs that could be emerging in those countries. This data showed that the greatest conversation trend in United States and United Kingdom were in Programming, Web and App development (66.3%) followed by Cybersecurity (11%) and Design (5.3%). Wich arises more needs in Cybersecurity and Design, compared to Jamaica.



Source: Digital Skills Monitor. Data collected from: Jul 1,2021 to Jan 31, 2023. Downloaded: 06/02/2023. Powered by Citibeats.

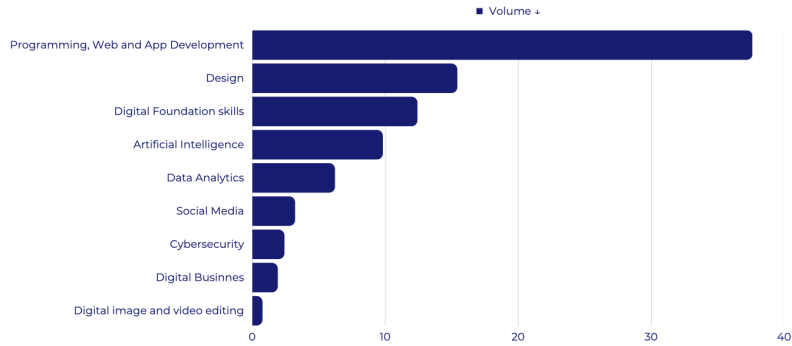
# The regional ecosystem



Data was collected across the Caribbean to ascertain a regional perspective in the context of CSME and regional migration. However, the data below focused primarily on remote offers.

- *Antigua and Barbuda*
- *Bahamas*
- *Barbados Remote*
- *Dominica*
- *Saint Lucia*
- *Saint Vincent & the Grenadines*
- *Trinidad & Tobago*

Regional ecosystem (excluding data from Jamaica)

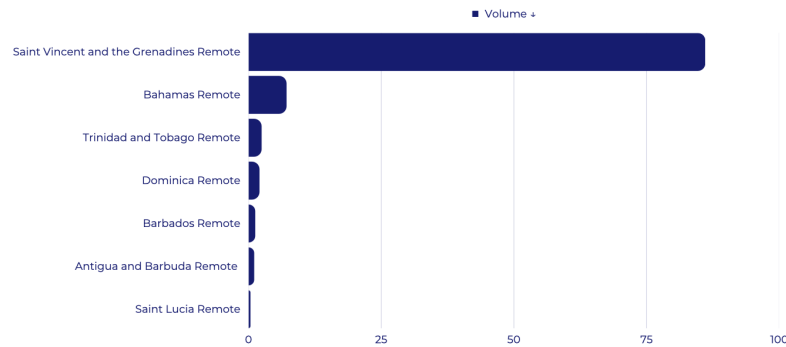


Source: Digital Skills Monitor. Data collected from: Jul 1, 2021 to Jan 31, 2023. Downloaded: 06/02/2023. Powered by Citibeats.

The data revealed that Programming, Web and App Development (37.6%) was also trending across the Caribbean, followed by Design (15.4%) and Digital Foundation Skills (12.4%).

Now we can see the distribution of the datasets used:

Regional data distribution



Source: Digital Skills Monitor. Data collected from: Jul 1, 2021 to Jan 31, 2023. Downloaded: 06/02/2023. Powered by Citibeats.





The data gathered over the period (July 2021 to January 2023) gives us the best overview of the trends in digital skills in Jamaica, the Caribbean, the US and the UK. This information will not only be validated utilizing further on-the-ground qualitative and quantitative analysis among Small and Medium Enterprises (SMEs) but it will guide the training program and curriculum under the JET project to provide relevant training and economic opportunities for youth.

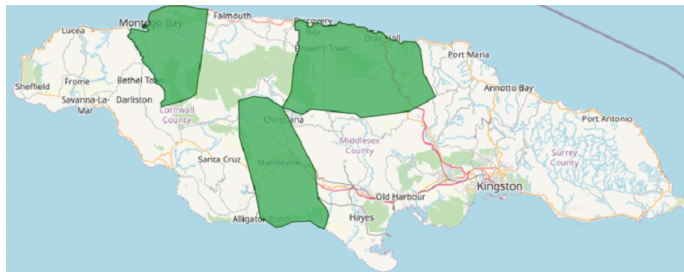
Additionally, the information will be disseminated and shared with project partners to help them understand the market and trends. As the platform created to analyze this data is updated in real-time, periodic monitoring and reports will be created to assess changes in the market.

Understanding the perceptions and needs of people is key to designing and responding to those needs through strategies, operations, and growth. In the report, we listened to the distribution of the conversation in the analyzed categories and will follow the evolution over time. We aim to listen and use the analysis of the citizens' needs to enrich the outputs of the JET project.

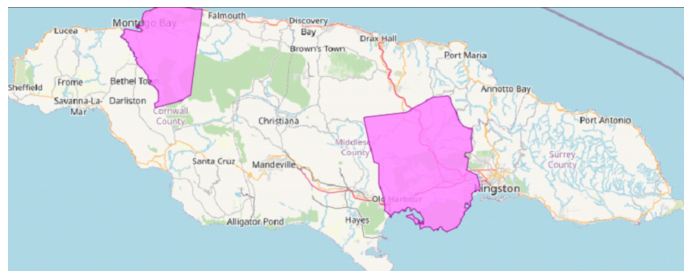
# Appendix

This is the data distributed by regions in Jamaica for the rest of the categories, considering data from July 1st, 2021 until January 31st, 2023.

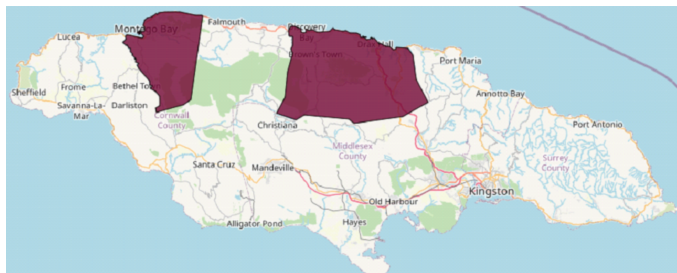
Design:



Digital Business:



Digital image and video editing:



As a reference, below are represented the performance metrics of the models used for this project.

Performance metrics

	Model	Accuracy	F1
Demographics	<b>Gender</b>	90.14	90.24
Demographics	<b>Organization</b>	96.43	93.09
Intents	<b>Complaints</b>	76.43	77.29
Intents	<b>Questions</b>	77.47	77.13

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