



Project Summary :: COVID-19 “Commerce with Confidence” Simulator

Background: Although there are many efforts underway that track and project the prevalence of COVID-19 cases and the respective capacity of the healthcare system to handle said prevalence, there is limited information, insights or tools that evaluate the appropriateness for communities and businesses to reopen with confidence. We have focused on building data sets, projections, and insights in order for our communities to actively “Flatten the Curve” to mitigate the risk of health catastrophe; however, we have very little insight on which communities and businesses should reopen, why they should reopen and how they should reopen. Considering each community and the businesses within are unique and idiosyncratic, it is imperative that a “one-size-fits-all” approach is not applied. Now is the time to build and provide a solution that can aid communities and business owners in deploying a confident strategy to reopen without the fear of resurgence and with respect to local commercial nuances. The goal of this project is to research, validate, and build a simulation tool and recommendation engine to support business leaders and community officials, whether private, public or governmental entities, with making the difficult decision to reopen their business and community and how to do so safely and with confidence.

Intellectual Merit: We are bracing for the reality that we will not have the ability to consistently test and retest entire populations frequently enough to ensure our safety and mitigate spread, therefore it is imperative to support community officials and business owners with a solution that simulates the impact of reopening their business utilizing comprehensive, multivariate data sets. This project has three specific goals, (1) to evaluate and validate key drivers of risk to businesses and communities; (2) to analyze and produce a “commerce with confidence” index for business owners and communities; and (3) to create a simulation tool for business owners and community leaders to support recommendations and decision making by utilizing “monte carlo” scenario planning.

The resulting system creates a practice for collecting data and performing the monte carlo analysis to determine likely commercial behavior and likely new infection rates. Analysis can be done at a fraction of human analysis times with greater accuracy. A 10x-100x improved cycle time for decision making will provide leaders with validated and verified data models on which to rely and will enable them to make informed decisions more quickly. We will develop a multi-dimensional model of the determinants to run monte carlo analysis of likely outcomes from varying businesses, behaviors and conditions. This solution will help business and community leaders model and plan for if they can reopen, how they can reopen, and what potential strategies might drive more or less risk.

Broader Impact: Upon conclusion of this project, there will not only be a simulation model and an application that will support the confident reopening of businesses across the state of North Carolina – there will be a scalable model that can be extended to the rest of the country. Furthermore, the simulation and application will be extensible to support new scenarios whereby communities can test, evaluate, and determine feasibility of post COVID-19 tolerance and applicability of new and innovative commerce. Moreover, the flexibility of the



infrastructure and resulting simulator will allow for additional applications to service other (natural) disasters (e.g. hurricane relief) and population health initiatives. More specifically, a follow-on application supporting the consumer to “socialize with confidence” enabling the individual to evaluate the risks and unique tolerance to limiting social distancing will enable us all to embrace a post-COVID reality.

The “**Commerce with Confidence**” Simulator will be driven by a baseline of existing data sets including, but not limited to:

- Health Data
 - [NC State Center for Health Statistics](#)
- Labor and Economic Data
 - [NC Demographics – NC County Profile Data](#)
 - [NC Dept of Commerce – Demand Driven Data Delivery System](#)
- Occupational Data
 - [COVID 19 Occupational Risk Score](#)
- Epidemiology Data
 - [COVID-19 Research Database](#)
 - [COVID-19 Dashboard by the Center for Systems Science and Engineering \(CSSE\) at Johns Hopkins University](#)
- Environmental Data
 - [Movement Maps/Network Coverage Maps](#)
 - [EPA EnviroAtlas](#)
- Attitudinal Data
 - [Global Database of Events, Language and Tone \(GDELT\)](#)
- Consumer Data
 - [Nielson Global Connect](#)

The proposed solution includes a machine learning platform, an interactive dashboard and a user-friendly mobile application which will collect data from individualized business data inputs such as business type, transaction volume, customer preferences, and other such activities of daily commerce. Ongoing, perpetual user-driven data streams will bring real-time modulation to the simulator as impact analysis and daily user engagement validate data variables and improve existing analytic strength. Iterative and agile development sprints will drive rapid improvement cycles incorporating new data sets and user preferences. Where data is not sufficiently accessible, assumptive and synthetic data sets will be created to augment simulations to ensure comprehensive evaluation.

Project Workstreams and Milestones (all workstreams and respective milestones operate in parallel and integrate with one another. There is a level of dependency, but they are not sequential in nature):

- **Data Utilization + Stewardship** – the evaluation, selection and management of data sources, with emphasis on the prioritization of adding data sources and creating new data sources.

- I. Milestone 1 :: Secure baseline data sources and establish initial county/business level risk index
 - II. Milestone 2 :: Isolate prioritized list of missing/assumptive data sources to strengthen model
 - III. Milestone 3 :: Secure additional data sources and launch iterative county/business level risk index
- **Market Development + User Research** – the establishment and development of trust and cooperation within each county targeted to ensure needs are sourced from those who have them.
- I. Milestone 1 :: Secure 3-4 priority counties and respective county and business leaders to participate in project
 - II. Milestone 2 :: Deploy discovery sessions within each county to source greatest needs, concerns and wishes at the county level to define a blueprint of priorities and user requirements for each county
 - III. Milestone 3 :: Deploy discovery sessions across businesses to source greatest needs, concerns and wishes to define a blueprint of priorities and user requirements for businesses
- **Platform + Application Development** – the design, development and deployment of an extensible platform that ingests and normalizes disparate data sets, as well as executes advanced machine learning to power a myriad of dynamic applications.
- I. Milestone 1 :: Build and deploy platform infrastructure, including database model and machine learning layer
 - II. Milestone 2 :: Build and validate recommendation engine and simulator that drives user interaction and confidence
 - III. Milestone 3 :: Build and deploy application to showcase county and business level risk index, recommendation engine and simulator
- **Program Promotion + User Adoption** – the execution of strategic marketing and communications to educate the market and foster community engagement to participate in this initiative.
- I. Milestone 1 :: Launch “Commerce with Confidence” campaign to drive awareness to program
 - II. Milestone 2 :: Source and secure early adopters and community champions to integrate real stories into campaign as testimonials
 - III. Milestone 3 :: Expand campaign to neighboring counties to lay groundwork for program expansion
- **Deliverable Evaluation + Measurement** – the reconciliation of the project through critical success measures and ability to pivot based on real-time data.
- I. Milestone 1 :: Reach above 80% confidence in machine learning models
 - II. Milestone 2 :: Reach above 90% satisfaction with application across users
 - III. Milestone 3 :: Reach state and national recognition for application utility



Activity Based Project Budget (further detail available upon request):

		FY21 (through December 30, 2020)
Project Oversight		\$ 42,000
	Project Management	\$ 42,000
Content Development		\$ 90,100
	Content Development & Curation	\$ 47,600
	Videography & Photography	\$ 42,500
Market + Customer Development		\$ 67,000
	Webinars + Community Engagement	\$ 21,000
	Business Development	\$ 46,000
Platform + Application Development		\$ 618,020
	Data Collection & Database Architecture	\$ 58,940
	Data Sets Licensing Fees	\$ 35,000
	Environment Set-up & DevOps	\$ 114,840
	Machine Learning Layer Customization	\$ 150,000
	Dataset Analysis & Translation	\$ 69,360
	User Experience Research & Customer Insights & Feedback	\$ 65,000
	Front End Development (Web + Native)	\$ 54,880
	Recommendation Engine Development	\$ 35,000
	Simulation & Visualization Software	\$ 35,000
Marketing + Promotion		\$ 100,240
	Marketing, PR, Communications + Social Media Mgmt.	\$ 42,000
	Creative Assets Design + Development	\$ 58,240
Total Budget		\$ 917,360

Key human resources that will execute across activities:

- Project Executive
- Project Management
- DevOps Manager
- Database Engineer
- Data Scientist
- Application/Web Developer
- Human-centered Design Facilitator
- UX/UI Designer
- Creative Designer
- Copywriter/Editor
- Marketing Coordinator
- PR & Social Media Coordinator
- Videographer/Photographer
- Website Developer
- Research Analyst
- Business Dev Representative