National Science Foundation (NSF) Career Compass Challenge:

My Career Compass

Submitted by:

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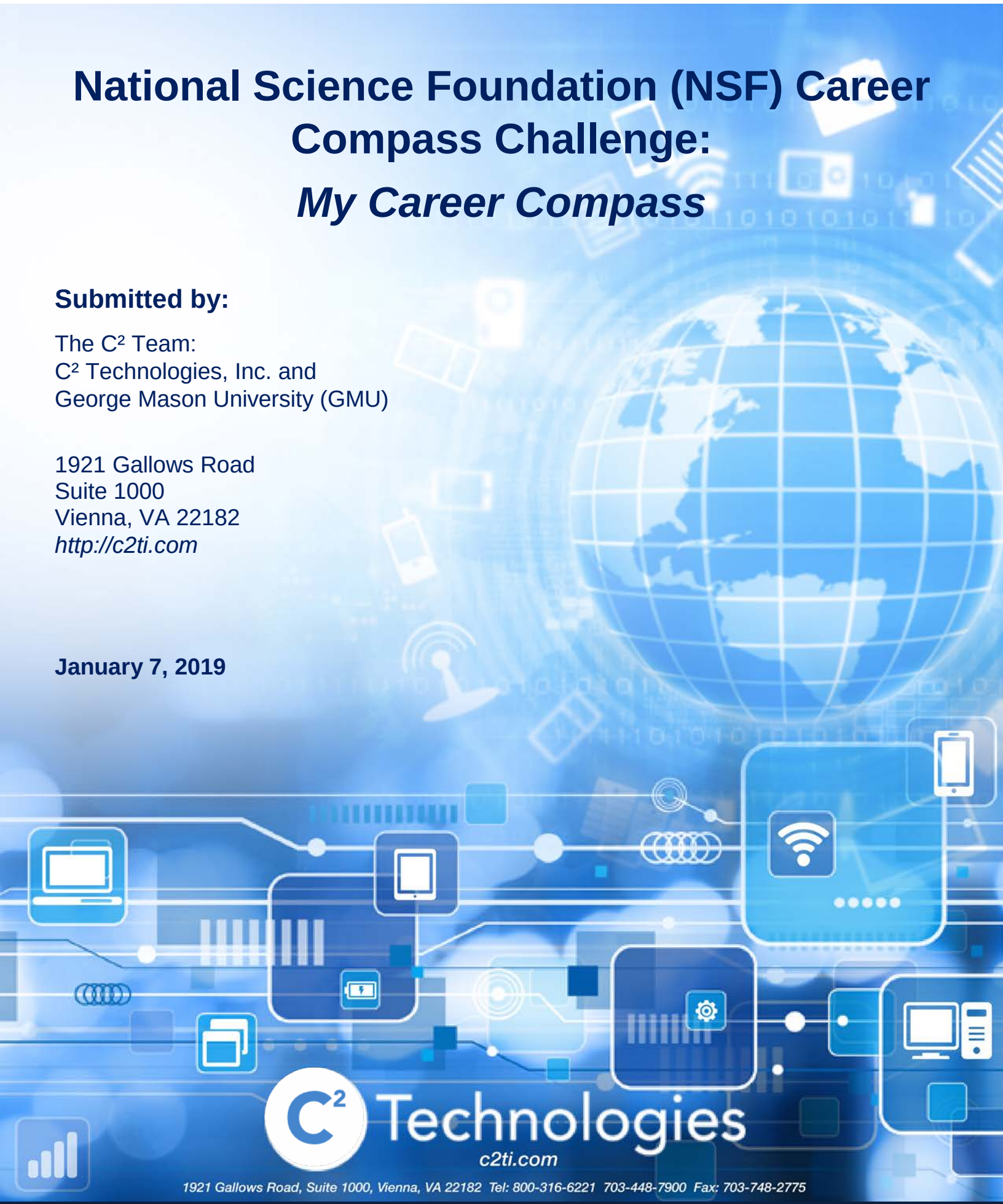

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Executive Summary

In order to survive and thrive in the increasingly volatile and dynamic work environment, organizations must become more agile in how they fulfill their missions and how they develop people. Today's workers and organizations must address a host of tough challenges, including continued pressure to do more with less, overwhelming amounts of information and work demands, change fatigue, constantly changing jobs, and uncertainty. These challenges will only continue to grow. While technology is a primary cause of this disruption, it also offers solutions to these challenges.

In response to the NSF Career Compass Challenge, the C² Technologies, Inc./George Mason University team (the C² Team) has imagined a Personal Learning Environment (PLE), called My Career Compass, which leverages emerging technologies to manage complexity while providing users with simplicity and focus. Based on user interests and skills, it dynamically creates several career path options and allows users to select and customize their optimal paths. At every stage of their career, My Career Compass supports users with access to a wide variety of learning and development opportunities that align to their selected career paths, established goals, and identified skills and interests. Many of these learning and development activities are integrated into users' daily work. Recognizing that the users, their professions, and the world will continue to change rapidly, My Career Compass dynamically updates its recommendations and alerts users to relevant changes in their professions. Drawing on large amounts of current data, it can predict trends and help users prepare for the future. This PLE provides a permanent, secure, and organization-agnostic record of a person's competencies, achievements, and accomplishments wherever they go throughout life.

The C² team's solution takes into account the self-regulated learning skills required for Personal Learning Environments, and incorporates the support structures to guide users to higher levels of self-directed learning.

Understanding the Challenge

The Future of Work

We live and work in a time of disruption, which is characterized by technological advancements that change entire industries overnight. The experts call it The Fourth Industrial Revolution (1)—a fusion of data, technology, and connectivity that blurs the lines between the physical and digital spheres. And it's just getting started.

As we struggle in our jobs and lives to keep up and make sense of it all, we must realize that the pace of change is accelerating. Our old models of work and learning no longer suffice. The future belongs to those who are willing to think and act differently.

In the future, the only certainties are uncertainty and change—disruptive change, change that is happening so fast that it's difficult to predict the future. According to Klaus Schwab, founder of the World Economic Forum, the speed of current breakthroughs has no historical precedent (1). Consider that businesses like Uber and Airbnb are just 10 years old, and yet many people cannot imagine a time without them. Consider that it took 50 years for 50 million users to adopt the telephone, while it took Facebook only 4 years to reach that milestone, and Pokémon GO

reached it in 19 days (2). Consider that many are predicting that within the next 5–10 years, 47 percent of total U.S. employment will be at risk due to automation (3). Consider that today's skills might be irrelevant in as few as 5 years (4).

Uncertainty is so much a part of this future that in their report, *Workforce of the Future: The Competing Forces Shaping 2030*, PricewaterhouseCoopers (PwC) imagines not a single future—but four very different scenarios, depending on competing forces (5).

What This Means for Organizations

This Fourth Industrial Revolution is the key concern for leaders of all types of organizations, including corporations; non-profits; schools, universities, and other learning organizations; and federal, state, and local governments. A "future of work" plan is now a must-have for organizations that want to continue to survive and thrive. Organizations that don't keep up will find themselves trying to lead in an environment that they no longer understand—one that no longer exists. Recognizing the urgency of preparing for this future, the Federal Government has added Reskilling the Federal Workforce as one of the cross-agency priority goals for the President's Management Agenda (6). In addition, government leaders now recognize that the future encompasses far more than technological changes, although technology is the driving force behind this change. Success in adopting and leveraging technological advancements requires close attention to the human side of change—the science of how people adapt to change and adopt new tools and processes. So, the Chief Human Capital Officers Council has been merged with the President's Management Council to ensure that all strategic decisions integrate human considerations (7). These new approaches are now being applied to the largest organizational change initiative that the Federal Government has ever undertaken—incorporating artificial intelligence (AI) into government functions (7).

To survive and thrive in this dynamic environment, organizations need to become more agile in how they fulfill their missions and how they develop people. They must recognize that their view into the future is short, and they will be required to adapt quickly as the environment evolves. Like the organizations they support, workers must also be more agile in their approach to work and in their own development. The possibility of working in the same job for the same organization over an entire career is now very rare. Even job longevity of a couple of years is beginning to seem quaint. More and more, workers must be ready to adapt quickly, to reskill continuously, and to integrate learning into every facet of their jobs (4). They will not have the luxury to take long breaks from their work to learn something new because of the demand to get more done at work in less time. They will need to be learning all the time, and reskilling at the moment of need. The keys to survival—and success—for individuals in this environment are continuous learning, contextual awareness, flexibility, and refining people and management skills (8). As Alvin Toffler, author and futurist says, "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."

The C² Team's Approach to the NSF Career Compass Challenge

In addressing the National Science Foundation's (NSF's) Career Compass Challenge, the C² Team's (C² Technologies, Inc. and George Mason University [GMU]) first step was to develop empathy for the NSF employee of 2030, as part of our human-centered design approach to developing human performance improvement solutions. After reading current research and

reports describing the future of work, we stepped into the shoes of future employees and considered what they might see, hear, and feel in their work environments. What would they be doing? What would be their challenges? What would be their pain points, and what gains might they realize?

We imagined a world where social media is the primary or only media. The employee gets up in the morning and tunes in to a social media channel for the latest news and daily reminders. This person is fluent in the language of data, and uses data to drive decisions. The lines between work and learning have been blurred. While reading the news, the employee might also be attending to work messages or researching a topic to discuss later that day. The employee will be sitting at the kitchen table, not necessarily in an office, working off of a cell phone instead of a desktop computer. He or she will work in small bursts, switching tasks often. In addition to interfacing with other people, the employee will work with bots and other AI applications to get work done. Some of the key challenges this employee of 2030 will face include:

- Continued pressure to do more with less. The employee feels like there is never enough time, money, or team members to fulfill organizational requirements. While some of his or her colleagues hope that more resources can be found, the employee is busy figuring out how to accomplish his or her goals with what's available—perhaps by implementing technology or streamlining processes.
- A sense of being overwhelmed. The employee feels overwhelmed by the pace of change and the need to do more with less. In the midst of the chaos, he or she looks for havens of focus and simplicity.
- Change fatigue. There is always a new system and a new approach to learn. The employee realizes that there is no end point at which time things will stabilize. Every day, there's a new challenge, and every day, the employee must learn something new.
- Constantly changing jobs. The employee works on a project with a team for as long as he or she is needed. The employee might not be part of any given organization. The employee's affiliations change based on his or her current projects. Although the employee may work for a specific organization, he or she is more of a freelancer within that organization—placed on projects based on his or her skills.
- Uncertainty. In a world where everything changes constantly, it's hard to know what direction to go in. What skills will be valued in the next couple of months? Where will the jobs be? What skills should be developed? The employee needs minute-by-minute intelligence on what is happening in the world and how he or she fits in.

As the C^2 Team imagined this environment and these challenges, we began to see how emerging technologies could support the workforce of the future by:

- Drawing on vast amounts of continuously updated data to show users current pathways and best practices for achieving their career goals (data analytics)
- Offloading mundane tasks to bots and other AI applications so users can focus more on high-value work that requires creative and critical thinking (AI and machine learning)
- Providing simplicity and focus via visually appealing, user-controlled interfaces (dashboards)

- Connecting with existing learning and development resources, both within the user's organization and outside of it (curation)
- Integrating learning into people's work so that they have the skills they need, when they need them, and providing numerous opportunities to practice in a meaningful environment to improve automaticity of new skills (9) (adaptive learning)
- Providing just-in-time assistance and coaching to support users (AI and machine learning)
- Alerting employees to industry changes that they must be prepared to address, and connecting them to developmental opportunities in the moment to address those changes (data analytics)
- Engraining good habits, such as planning and continuous learning, into daily activities (integrating work and learning)
- Continuously reinforcing underlying skills—such as critical thinking and interpersonal skills—which are important for all jobs, while updating technical skills as required at the moment of need (integrating work and learning)
- Developing predictive pathways based on data to show workers how to prepare for the jobs of the future (predictive analytics)

To leverage the capabilities of emerging technologies and ensure a human-centered design approach, our proposed solution considers human factors related to implementation. This type of personalized learning environment (PLE) requires learners who are self-motivated and self-regulated. The impetus for learning shifts away from the employer, teacher, or professor to the learner. This is a big shift that can be difficult to navigate. Dr. Nada Dabbagh and her team of researchers at GMU have studied this shift in thinking as it applies to PLEs and have devised a three-level framework for moving today's technology users to a state in which they own their learning and development—actively creating their own PLE (10).

- In Level 1, Personal Information Management, users apply Web 2.0 technologies to engage in the self-regulated learning (SRL) processes of goal setting and planning. At this level, coaches and teachers guide users to create a personal or private learning space by self-generating content and managing this content for personal productivity or organizational tasks—such as creating online bookmarks, media resources and personal journals and calendars, as well as localizing learning around a specific topic.
- In Level 2, Social Interaction and Collaboration, users activate the technology's social sharing and networking features to trigger communication surrounding the learning topic through peers and informal learning communities, thereby extending the PLE from a personal learning space to a social learning space. Social and collaborative activities engage users in the SRL processes of self-monitoring and help-seeking, prompting them to identify strategies needed to perform more formal learning tasks to achieve their goals.
- In Level 3, Information Aggregation and Management, users leverage the technology to synthesize and aggregate information from Levels 1 and 2 to reflect on their overall learning experience. This allows them to take greater control of their PLE, customizing and personalizing it around their learning goals. At this point, users apply the SRL

processes of self-evaluation, self-reflection, and self-correction to influence subsequent efforts of learning goal attainment.

The pages that follow provide more detail on a solution, called My Career Compass, that leverages the capabilities of emerging technologies to envision a whole new work model—one that helps employees succeed in the volatile, uncertain, complex, and dynamic work environments of the future. In support of that solution, the C^2 Team has considered a methodical process for preparing the workers of the future to make this type of technology a part of their everyday lives. Our proposed solution also allows for each level of the PLE framework to be reached.

About Our Solution

The key premise for My Career Compass is as follows:

Sophistication in data and machine learning behind the scenes serves up focus and simplicity to the user to accomplish his or her learning and career goals through a PLE.

My Career Compass provides many points of access so that it is widely available and helps people achieve their goals. It leverages data and machine learning to automate tedious or complex tasks so that employees can focus on the activities that will allow them to create the most value for the organization. Our team's solution personalizes each employee's experience based on his or her past experience and future goals. It also allows employees to further customize their activities to position themselves uniquely for where they want to be in the future. Using standard database techniques and distributed ledger technology, it allows all of these activities to be recorded in a permanent and secure record that can be shared with potential employers or educational institutions. Independent of any organization, this record shows a user's entire history of competency development, allowing him or her to customize how it is shared to meet the needs of specific job and developmental opportunities.

Specifically, our vision for this solution includes the following technological considerations and is depicted in the architecture diagram shown as **Figure 1** on the following page.

- My Career Compass is a smart app, enabled through data analytics and AI or machine learning, which dynamically populates suggested learning and developmental activities; recommends career paths; provides suggested dates for goal completion; and enhances many other system features.
- My Career Compass is a web app, meaning it is accessed through a web browser and not an application that must be housed and downloaded from an app store.
- The application is mobile-compatible for ease of use via computers, tablets, or phones and includes touchscreen technology.
- Anyone can register to use My Career Compass, and a user's dashboard and other information can be accessed via a login established at the time of user registration.
- A user's registration is not connected to any single organization or agency, but the user can allow the application to connect with systems within his or her organization (e.g., an agency's Learning Management System or other Human Resources systems, a company's internal job postings or newsletters, or a university's course catalog).

- The database behind the application—and therefore the associated data—is housed on a FedRAMP-approved cloud server that is likely owned and operated by NSF (or another parent or sponsoring entity), but is outside of any given agency's firewall and is accessible by any registered user at any time, from anywhere, on any device.
- The solution securely stores user information that includes career paths, goals, learning and achievement records, etc.
- The solution includes an open application program interface (API) that allows a user to link to his or her phone or work calendars; access job opportunities available through a variety of job boards; link to social media; connect with an organization's internal resources and Human Resources systems (if the user elects to do so); and access a wide range of publicly available learning and development resources.

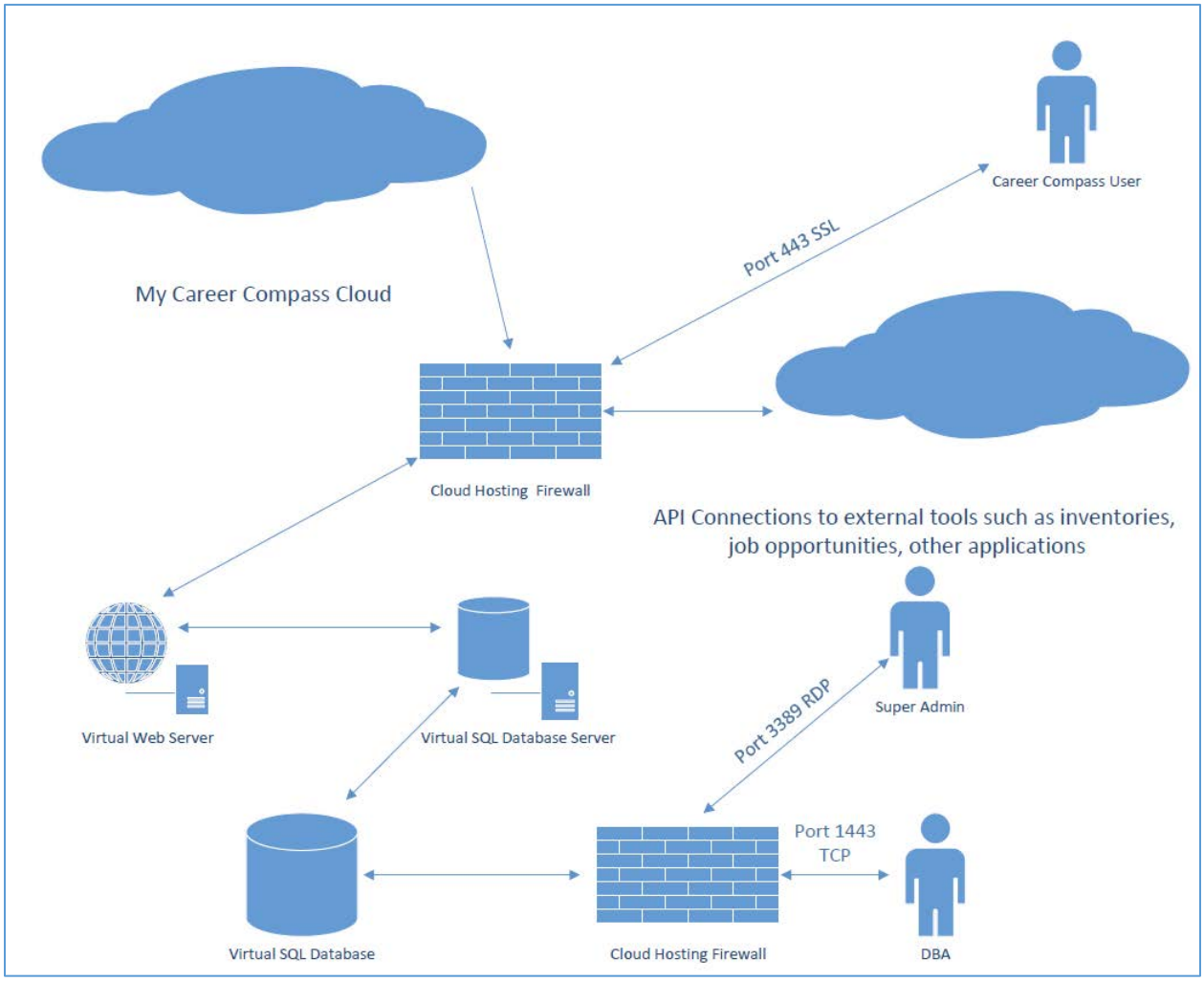

Figure 1. My Career Compass Architecture

Key user features of My Career Compass include:

- A dashboard-based look and feel, for access to daily information that is intelligently populated based off of all user interactions with the application. The dashboard provides a consolidated look at what is available and aligned to the user's interests and needs, so that the user does not have to do that research. This helps prevent the user from feeling overwhelmed by the vast amount of information to process.
- Career pathing that includes suggested career paths based on a user's interests, skills, education and current job, as well as trends in the job market. The app allows a user to customize career paths.
- Goal setup and progress tracking that includes suggested timelines, or the option to create user-defined timelines for accomplishment. Goals are intelligently populated based on career paths and other user information in the application. The user can edit or remove the goals, and add goals. He or she can also export goals to share with a mentor, coach, or manager.
- Intelligently populated suggested learning and developmental activities that are connected to career paths, goals, user interests and skills, trends, breaking news, etc. The activities will include links to articles; available courses; experiential opportunities, such as available details or apprenticeships; and reminders about steps necessary to reach identified goals.
- The ability to add suggested learning and developmental activities to the user's calendar(s) from the daily feed that displays on the dashboard, so that learning and reskilling is incorporated into work and the user mindfully plans for his or her continued growth.
- Skills and interest inventories and assessments that allow the user to determine skill gaps and desired future career and learning direction. Results are stored in one location.
- Links to potential job opportunities aligned to the user.
- "Your Career Coach," which is an AI-enabled chatbot that shows users how to use the tool, and can report out to the user (via voice interaction) what is on his or her dashboard for the day.
- "My Career: Achievements and Accomplishments," which is a resume builder that accumulates learning achievements and other accomplishments by connecting to an agency or company's Learning Management System—if a user elects to make that connection—and to other learning environments that provide certificates of completion (e.g., Coursera). This resume builder also allows a user to input his or her own accomplishments and upload supporting documentation, as desired. It contains a sort feature so that a user can arrange his or her accomplishments to match a need, such as a job posting, and allows for the export of that information. Blockchain technology can be coupled with the other data storage mechanisms to ensure that this repository of achievements and accomplishments is a permanent, secure record that accompanies users wherever they go throughout life.
- A Dream Board that allows a user to "mind map" larger goals, interesting thoughts, or dreams about the future. The Dream Board provides drawing tools and the ability to upload images or links. It also allows the user to tag any of the items on the board to incorporate them into his or her goals. This feature facilitates long-term planning.

In keeping with My Career Compass providing many points of access, and the vision of this application as an organization-agnostic tool that can (and should) be accessed throughout (and before) a career, the C² Team also considered how potential users would become aware of the application. We determined that an outreach or marketing campaign should accompany the application's release, so that widespread use of the tool to enhance career development and lifelong learning is available to the broadest audience possible. As highlighted in the Possible Usage Path shown in **Figure 2**, the application can be leveraged for learning and career planning at the high school and collegiate levels—perhaps as guidance counselors help high school seniors plan their futures, or as a graduation requirement in a university capstone program. To make the application available to the general public, mall kiosks or online ads could prompt users to engage in a game-like skill or interest quiz that launches the player into the application's registration page. These outreach paths, as well as the features of the system itself, will help break down barriers for people who may perceive developmental or employment opportunities as inaccessible.

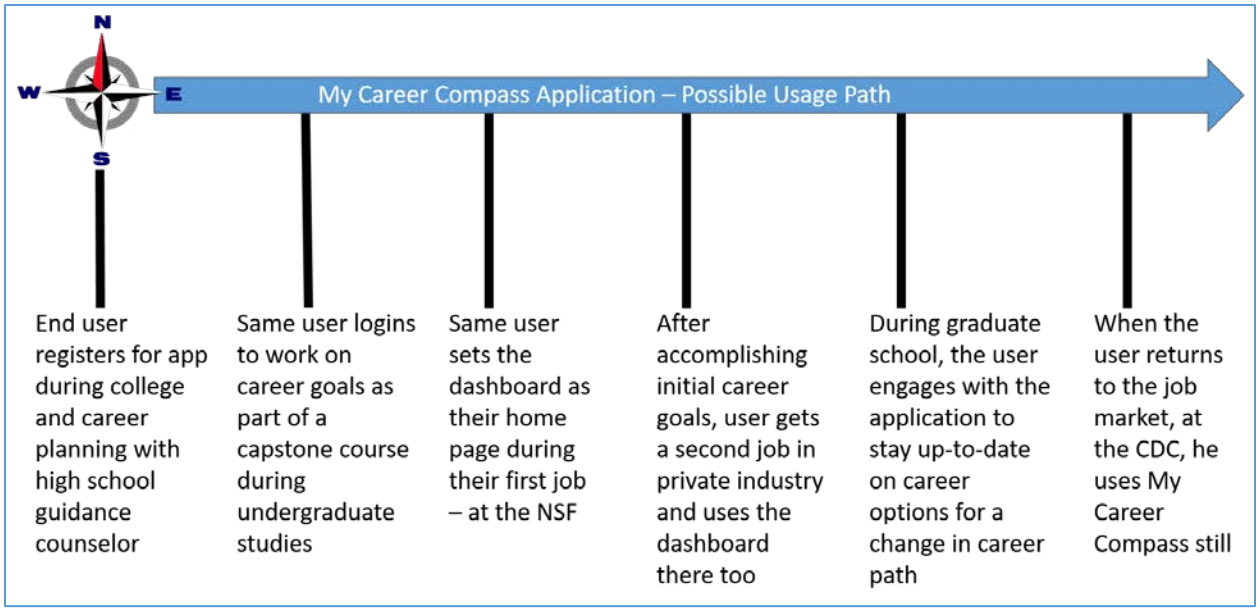

Figure 2. My Career Compass Application – Possible Usage Path

This usage path depicts how the three levels of the PLE framework are implemented. In the early years, when users are first introduced to the My Compass application, they will be supported by a coach or guide to help them achieve Level 1 (Personal Information Management). If they are in school, teachers or guidance counselors will guide them. If they are on the job, their managers or mentors will guide them. All of the functionality to achieve Levels 2 (Social Interaction and Collaboration) and 3 (Information Aggregation and Management) will be available at all times within the application so that users can leverage that functionality when they are ready. During Levels 2 and 3, peers and colleagues take on more importance than teachers or guides.

The Use Case for Our Solution

NSF's vision for the Career Compass Challenge was to:

Imagine a mechanism that rapidly enables an individual to match their skills and interests to current and future work opportunities, leveraging advanced technologies which incorporate learning and development needs (traditional, non-traditional, and experiential), and that provides direct access to options for obtaining the relevant expertise to ready the individual for the chosen work.

To see how the C² Team's solution meets that vision, let's look at a use case of how My Career Compass might work for a typical user.

Meet Tamara Chen!

- Tamara is a Jr. Research Scientist in the Environmental Research and Education organization at NSF. She has been with the agency for just under one year.
- She is a recent graduate of the University of Virginia, with a B.S. in Environmental Science.
- She is currently working on a data collection and analysis project on biodiversity in ocean habitats in Southeast Asia; marine biology is of special interest to Tamara.
- Tamara knows that eventually she wants to be the director of a research group, and she assumes that she probably needs to earn an advanced degree to help achieve that career goal.
- Tamara is also aware that she will have to learn additional skills, such as how to write grant proposals, to stay abreast of the changes in her work world.

Through an advertisement board in the lobby, Tamara learns about a great new application that the NSF is encouraging all employees to use. It's called My Career Compass, and she's directed to *www.compass/registration.com* (or something similar) to register.

When Tamara reaches the website, the first thing she needs to do is set up her User Profile (**Figure 3**).

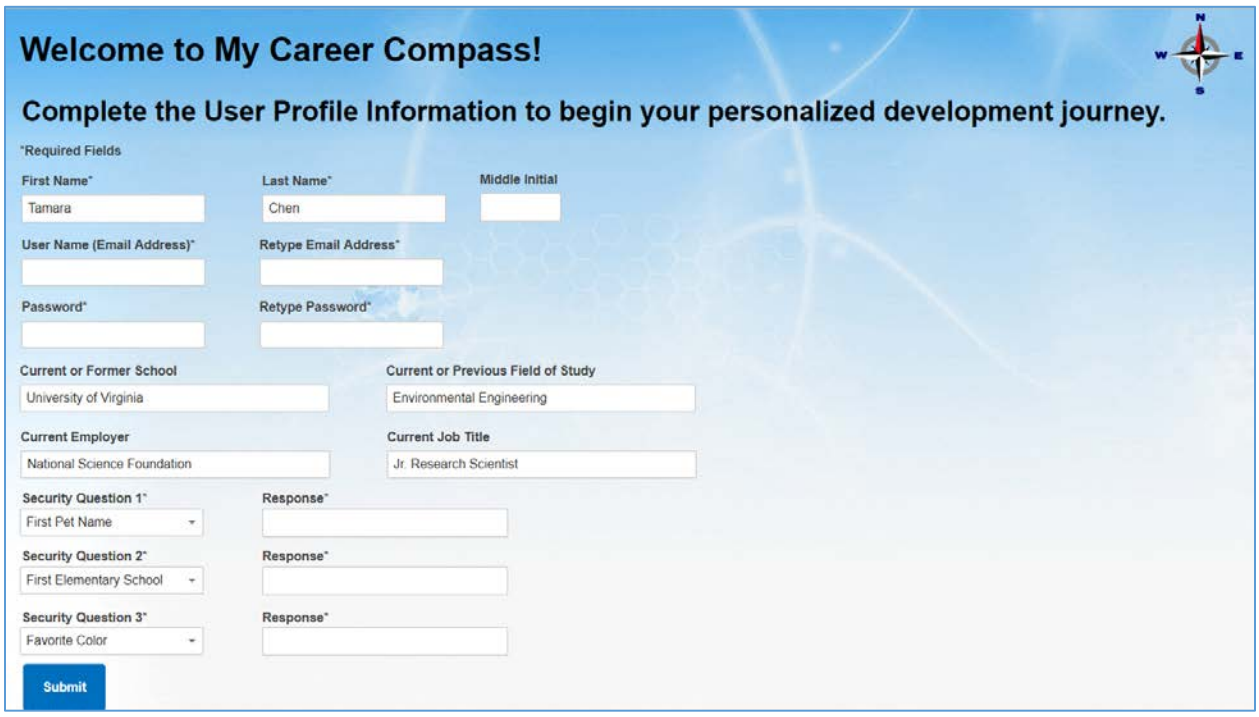

Figure 3. My Career Compass User Profile Information / Registration Page

On the User Profile Information page, Tamara sets her password; selects security questions; and provides initial information related to her employer, job title, and field of study. Tamara is then asked to establish connections to her calendars and to her employer's internal systems, based on the organization's security rules, if she would like.

Once Tamara completes her basic profile, she is led through a Skills and Interests Inventory that helps the application select possible career paths, identify typical goals, and populate her initial learning and development activities. Tamara has the ability to skip this inventory process, but the application will have less data to work with in terms of intelligently populating the other areas of the application. If Tamara has questions on how to use the application, she can select the View App Tutorials button on the screen to access a menu of choices that include testimonials on how others use the app for the greatest benefit.

Two potential questions in the inventory are shown in **Figures 4 and 5**, but the actual survey would be based on industry standard Skills and Interests Inventories, tailored by Industrial/Organizational Psychologists for validity and reliability. The application will use intelligent processes such as Natural Language Processing (NLP) to pull in learning and development opportunities based on the survey responses. These opportunities will correlate to both her current working environment and goals, and possible future career needs or interests, so that Tamara is constantly reskilling and prepared for what may lie ahead.

Note that if part of the outreach campaign for the use of the application includes online ads that begin with a Skills and Interests Inventory, this step would have already been completed when the user is taken to the registration page.

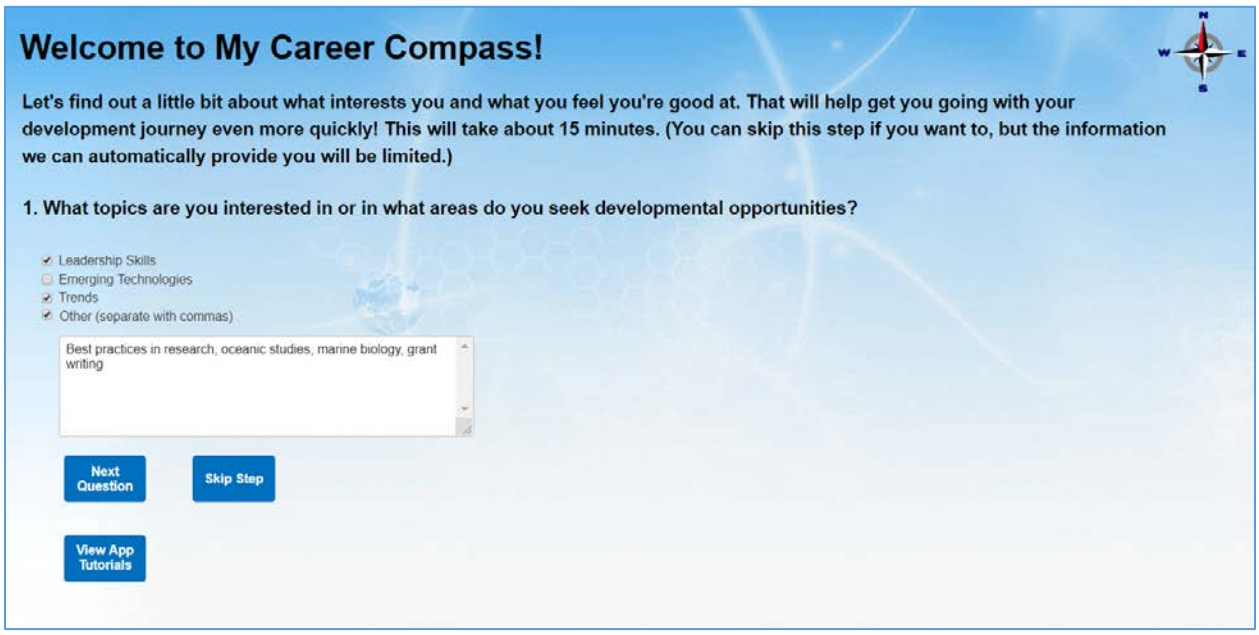

Figure 4. Potential Question 1 of the Skills and Interests Inventory

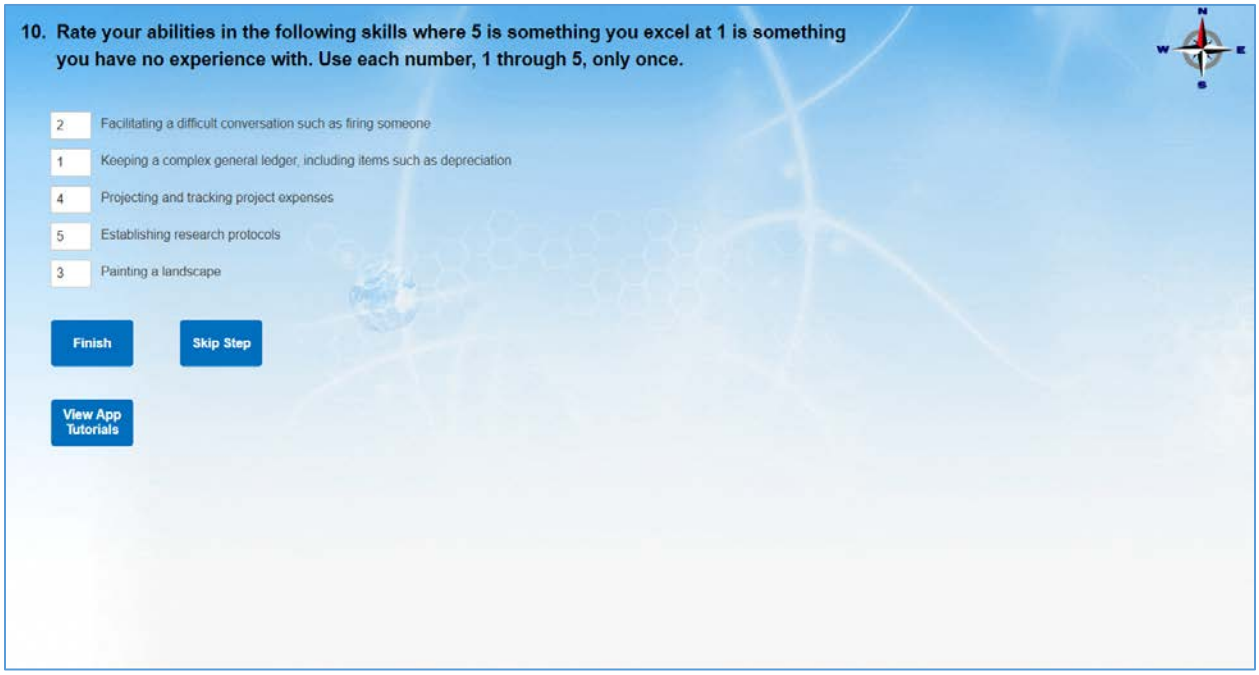

Figure 5. Potential Question 10 of the Skills and Interests Inventory

After the Skills and Interests Inventory is completed, the application will take Tamara to the first page of her career path information (**Figure 6**).

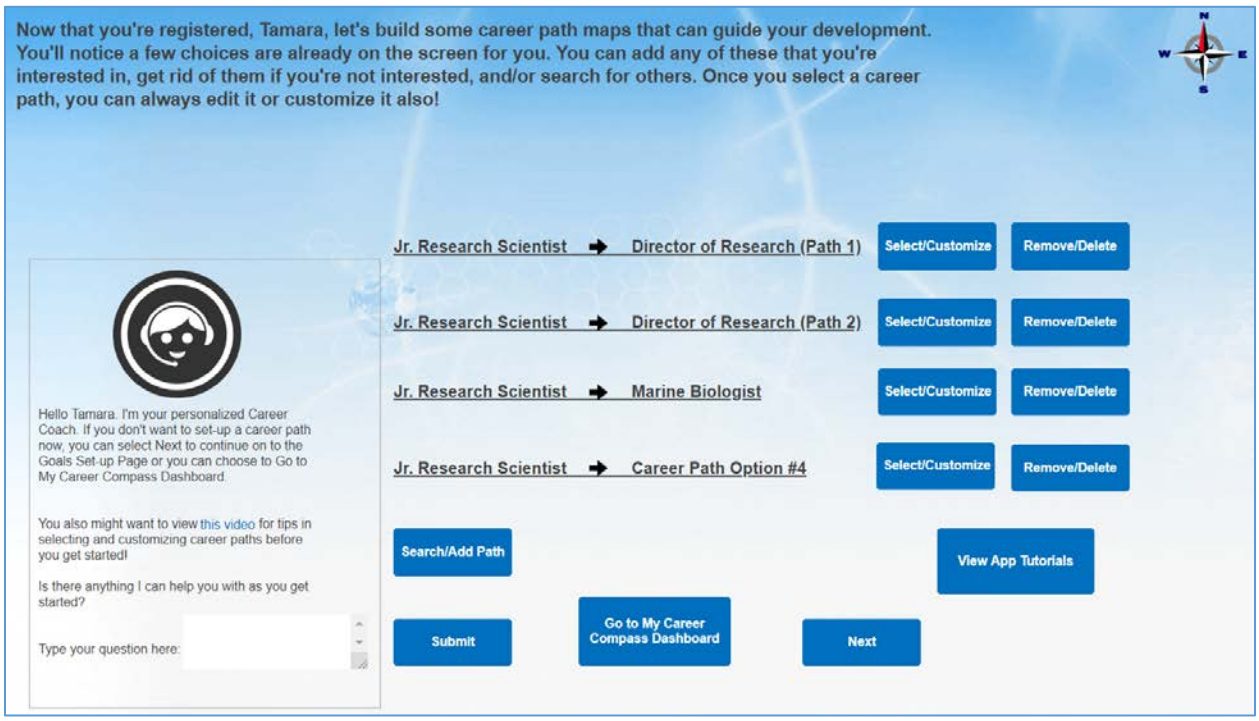

Figure 6. My Career Compass Career Path Home Page

The application will establish up to four career paths as initial options for Tamara to evaluate, based on the information she has put into the system so far. She can opt to select or remove any of the options automatically presented to her, can customize any of the options provided, or can choose to add a career path of her own. Tamara can select one of the options presented to learn more about that career, including what attributes or characteristics would be a good fit for that position. The information about fit helps people envision themselves in future careers.

Note that in **Figure 6** (above), two options are presented for Director of Research. This is because the same ending career position may be included in two different paths; that is, there may be more than one option for reaching that career goal. This feature helps break down barriers for people who perceive that a certain career or career path is unattainable, and the application will serve up developmental opportunities associated with the career paths selected, so that a user can easily take advantage of them.

A personalized Career Coach and chatbot is embedded in the application, providing Tamara with valuable information about how to use the tool. In **Figure 7**, the Career Coach tells Tamara that she can continue with this page to complete more setup tasks, or she can return to that later and proceed directly to her dashboard, which will be described in more detail later.

The Career Path Builder will lead Tamara through each selected career path, as shown in **Figure 7**, so that it is tracked in My Career Compass, her PLE. She can also change career paths anytime she wants.

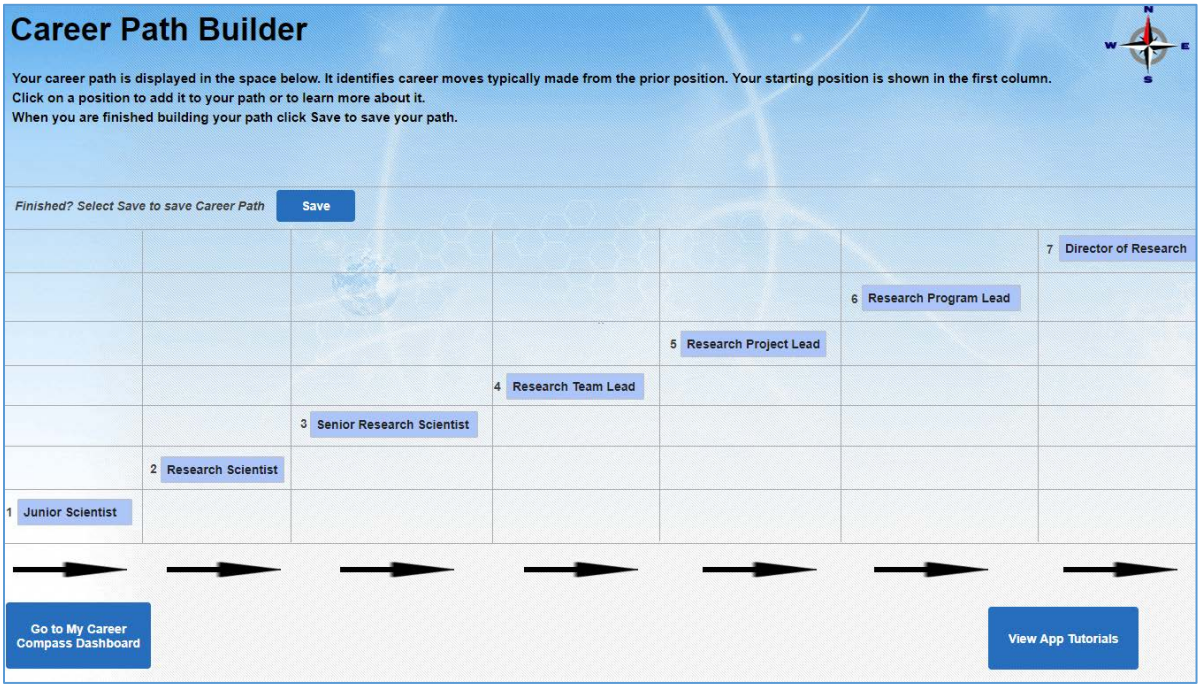

Figure 7. My Career Compass Career Path Builder

My Career Compass helps Tamara set goals to fulfill career paths that she selects, and she can add or remove goals from those that are generated (**Figure 8**).

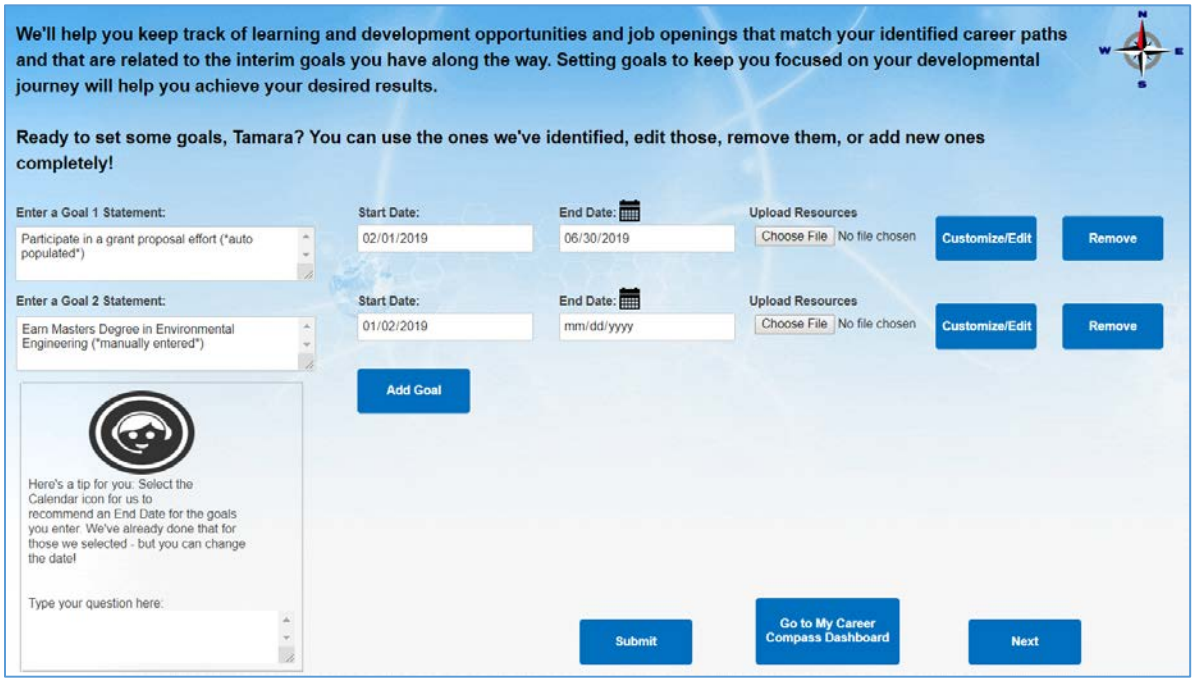

Figure 8. My Career Compass Goal Setup Page

Notice that the application generated a goal of participating in a grant proposal effort based on the career path of becoming a Director of Research. The application determined that Tamara should begin work on that goal in the next month, and that it should take about six months to complete. Tamara can change the start or end dates of the goal, even though the system provided suggested dates. Tamara also manually entered a goal to earn a Master's Degree in Environmental Engineering, and has selected to begin working on that goal immediately. She can enter an end date for the goal or prompt the application to generate an end date. She can also remove or add goals at any time.

Once Tamara sets up her goals, the system intelligently populates suggested activities to meet those goals, and she can also plan out activities to fulfill those goals on her own (**Figure 9**). My Career Compass will then find developmental information and activities that support the steps needed to accomplish Tamara's goals.

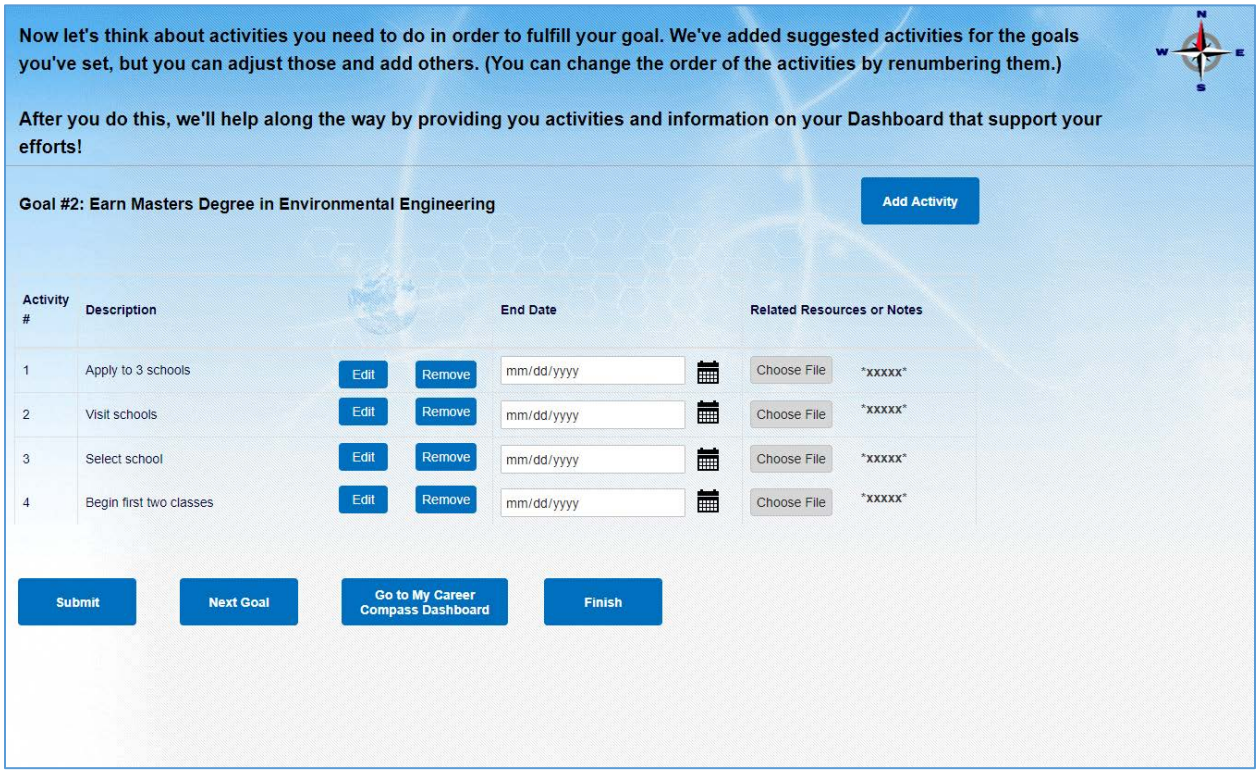

Figure 9. My Career Compass Activities Setup Page

As described previously, Tamara could choose to go immediately to her My Career Compass dashboard instead of proceeding through all of the setup stages at once. The more initial setup that Tamara completes, the more tailored her dashboard will become. Her dashboard will also evolve as she continues to use the application and the system learns what she needs or is most interested in. Let's assume now that Tamara has completed all of the initial setup and is logging in to her dashboard that she established as her browser's home page.

When Tamara logs in every day to *www.mycareercompass.com* (or something similar), she will see a dashboard like the one shown in **Figure 10**. Some features and the layout of the dashboard will be common for all users; however, leveraging data analytics and machine learning, the information that is presented in each of the dashboard sections will be tailored to the user.

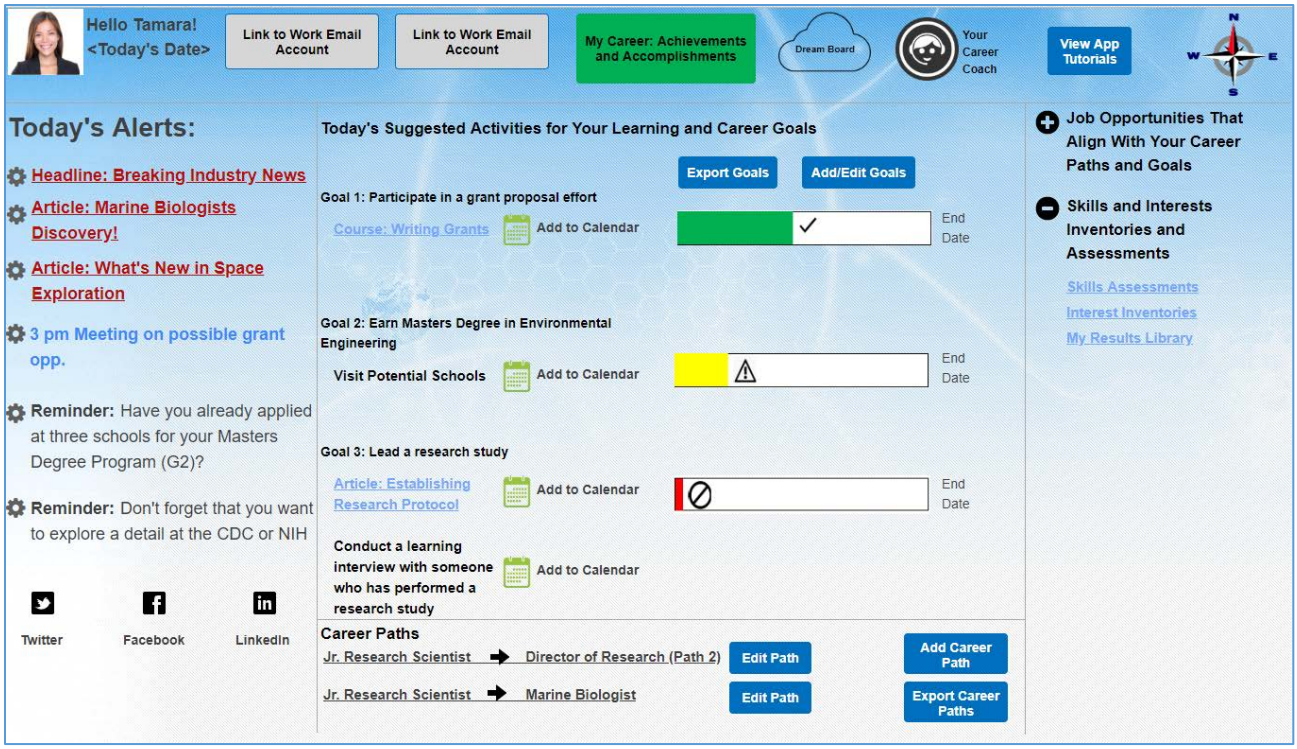

Figure 10. Tamara's My Career Compass Dashboard

Along the top of the dashboard, Tamara sees links to:

- User Profile editing options and the logout option (via her picture next to her name)
- Her work email account (or whatever email accounts she configures during registration)
- Her calendar (whichever calendars she configures during registration)
- The My Career: Achievements and Accomplishments page
- Her Dream Board
- The Your Career Coach chatbot
- The App Tutorials (which include testimonials from users on how best to use the application)

In the left-hand column, Tamara sees her daily alerts, which are tailored intelligently based on her Skills and Interests Inventories, her career paths, her goals, and items that she has tagged on her Dream Board. The items that appear in the Today's Alerts section change on a daily basis and are fed into the dashboard through behind-the-scenes searches of media, her calendar, and all of the application data. This content curation is completed using AI technologies that include NLP. Alerts are separated by type—links to articles, courses, etc.; items already existing on her linked calendar(s) that connect to the data within the application; and reminders associated with

the application data. She can also link to social media feeds from the Today's Alerts section of her dashboard, and configure the application to pull in information from her social media accounts so that all of her alerts and available developmental opportunities are available in one place.

In the center of her dashboard is information related to her goals and career paths. From this area, she can track the progress she's making on her goals and access suggested learning and developmental activities related to those goals. This provides Tamara with positive reinforcement as she integrates learning and development into her daily routine. Notice that in this section and in the alerts area, Tamara is provided with formal and informal learning opportunities, in addition to experiential opportunities that help her development (e.g., "Conduct a learning interview with someone who has performed a research study" and "Reminder: Don't forget that you want to explore a detail at the CDC or NIH"). She is provided an option to add developmental activities to her calendar so that she builds learning and reskilling directly into her current workday. Tamara can also export her goals for sharing with a mentor, coach, or manager and can edit her goals at any time. Similarly, Tamara can revisit and update her selected career paths at any time.

On the right side of the dashboard, Tamara can open the section related to job opportunities that might be of interest to her, or the section containing links to other Skills and Interests Inventories and assessments. Job opportunities are found by the system scanning all the top job boards available, as well as any internal positions, because Tamara opted to link to the NSF internal site during her registration process.

In addition, all of Tamara's dashboard and My Career Compass features are available from her phone and tablet so that she can keep up with her goals and learning on the go (**Figure 11**). She can even ask her smart device to have her Career Coach provide her with daily dashboard information verbally while she is getting ready for work in the morning—allowing her to update her calendar and be prepared to start her workday.

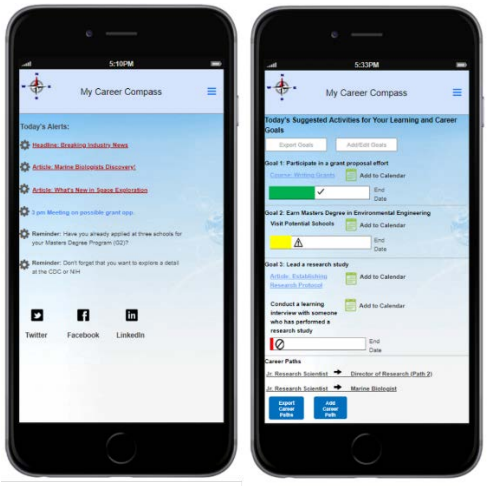

Figure 11. Tamara's Mobile-friendly My Career Compass Dashboard

The My Career: Achievements and Accomplishments page (**Figure 12**) allows Tamara to track the events she completed and upload any certificates of completion, badges, or other

documentation associated with those learning and development events. The page will automatically populate when any linked entity—such as Coursera, LinkedIn, or an agency's LMS—provides completion information to the application. Alternatively, Tamara can manually add achievements and accomplishments. This page allows Tamara to keep all of the information about her competency development in one place. She can sort the data based on column title or using a keyword search functionality. Tamara can also print this information, email it to someone, or add items to her LinkedIn profile.

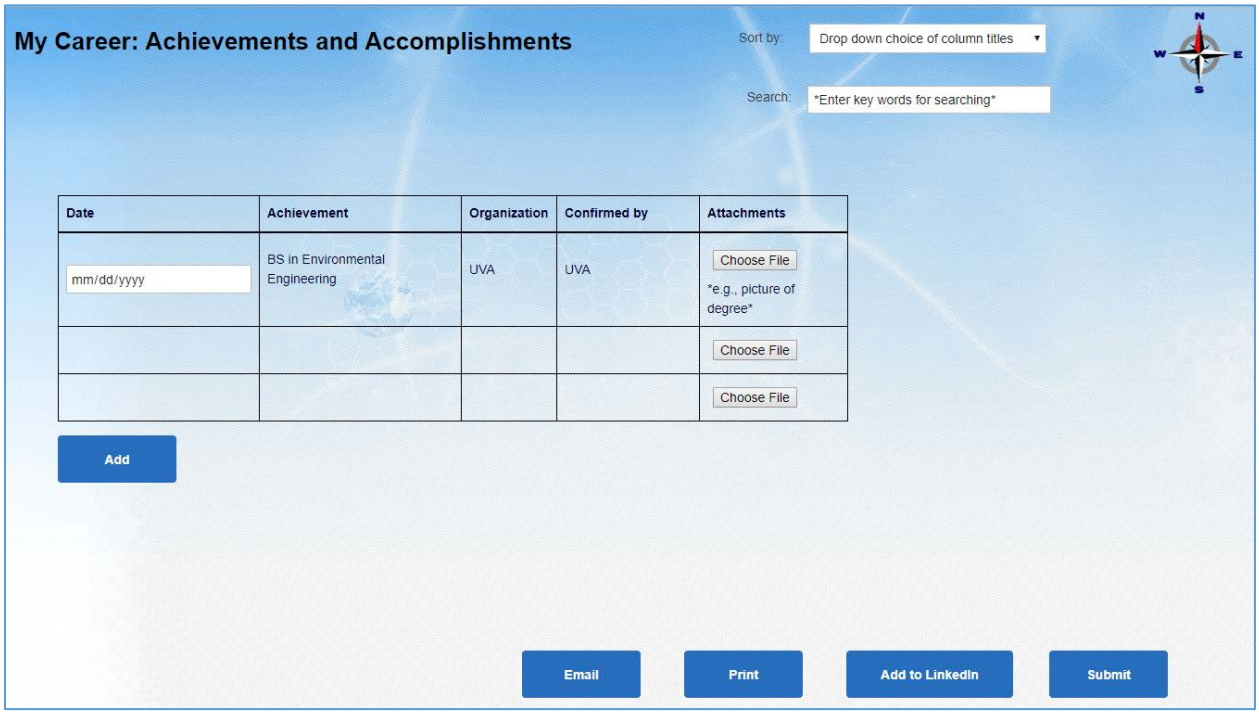

Figure 12. The My Career: Achievements and Accomplishments Page

Lastly, let's not forget that Tamara might have thoughts, interests, and dreams that may or may not be a part of her immediate developmental goals. She can capture those on her My Career Compass Dream Board (**Figure 13**), so that she has them at her fingertips for inspiration and motivation, and so that she can add them to her goals when she is ready. The Dream Board is set up like a drawing canvas where Tamara can "mind map" whatever she is thinking about. She can also add links to articles or images. With the click of a button, she can add her dreams to her goals, and the application scans the Dream Board to provide additional information on her dashboard that may be of interest.

Figure 13. My Career Compass Dream Board

Summary

From planning and dreaming to executing and achieving, My Career Compass supports the workers of the future with a dynamic PLE for developing career competencies throughout their lives. In this way, it provides a platform for continuous learning and reskilling in the moment of need. By providing a permanent and secure record available on any platform, it creates a holistic view of each worker's competencies in their chosen career—including all activities, both formal and informal, on the job and on their own, that have developed those competencies. My Career Compass dynamically shows workers the path ahead so they can adapt as the environment changes. Instead of removing them from the work environment for learning and development activities, My Career Compass integrates learning and development into their work world so that the workers can seamlessly switch between learning and executing to achieve their own goals, as well as those of the organizations they support.

Although this part of the NSF Career Compass Challenge focuses on imagining a concept, the C^2 Team's solution is based on existing career-pathing functionality that we have developed and customized for several federal agencies, including the Federal Aviation Administration (FAA), Federal Emergency Management Agency (FEMA), and Centers for Disease Control and Prevention (CDC). This functionality provides a starting point for our concept, and additional work that GMU and C^2 have already been involved in related to gamification, machine learning, and using data analytics to drive connection to personalized information positions us well for the next stage of the challenge and implementation in the future with NSF and other organizations.

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* Please note that the number of the reference corresponds to the citation number noted in the document text.

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