2017 eBusiness Technology MSIT Practicums

This document contains one-page descriptions of the nine Practicum projects available to eBusiness MSIT students in 2017. Please read the descriptions carefully. You are asked to give your preferences for all the projects and email your choices to Sujata Telang (stelang@andrew.cmu.edu) by NOON on Wednesday, June 21, 2017. If you do not send your preferences by that time, you are giving the faculty the power to assign you to any Practicum.

You should give a preference ranking for AT LEAST YOUR TOP FIVE PROJECTS. Your first choice should be indicated by a "1", your second choice "2," etc., and your last choice by "5." You may rank all of the projects if you wish. The teams will be selected by the Program Faculty and the Program Director by June 23. You will be informed of the team you are on by email. We will try to give everyone their highest choice possible, but there are several factors that must be considered:

1. The most important consideration in team composition is sponsor satisfaction. The TEAM TECHNICAL grade for the Practicum is based ENTIRELY on how well you meet the sponsor's requirements, as evaluated by the faculty (not the sponsor). We therefore choose teams whose members have the background and skills necessary for each project. For example, if a Practicum requires substantial programming, we must be sure that enough skilled programmers are on the team to do the necessary coding.

2. If everyone selects the same project, then most of you will be disappointed. For maximum satisfaction, you should try to distribute yourselves evenly among the projects. It is OK to discuss your preferences with other students before making your rankings.

3. We will try to honor your preferences but we occasionally must dip below your first few choices to ensure proper team composition.

You are advised to choose projects that interest you, without regard to the size or fame of the sponsor. You will be notified by email which team you are on. NO requests to change teams once assignments have been made will be considered. DO NOT request assignment to the same team or different team from any other person. Such requests are not helpful and will be ignored.

Practicums will kick off during the week of June 26, normally on Monday, June 26. After the kickoffs, the precise scope of each project will be negotiated between the sponsors and the teams. Each team will be assigned a Consulting Faculty member and a Program Faculty member as advisors.

Grades for the practicum will be submitted to the Registrar before the Practicum Competition Friday, August 25, 2017. There is NO CONNECTION between your grade and the results of the competition. Each team will have AT MOST 20 minutes to give a presentation and demonstration, followed by AT MOST 5 minutes of question and answer. A panel of independent judges will award ONE $14,000 prize to one team for the Best Practicum. The judges will also award ONE second prize of $7,000. "Best" means the team that scores the highest based on the effectiveness of your solution and the quality of your presentation. The judges will not know the academic grades that have been given for your work. During the question and answer period, only the judges ask questions. The audience may not. The judges will make their decision only on what takes place during the presentation and question and answer period.

To participate in the Practicum, you must agree to sign a Participation Agreement, which is part of an Educational Project Agreement that exists between the University and each Practicum Sponsor. Examples of both documents, approved by the University, are included here for your reference, but please DO NOT SIGN either right now. In some cases, you may be asked by the sponsor to sign a non-disclosure agreement because the sponsor may need to reveal confidential business information to you in connection with the project.

Once you have been assigned to a Practicum project, you will be given the Educational Project Agreement for your project and a Participation Agreement specific to your project, which you should then complete, sign, and return immediately. If a non-disclosure agreement is part of the relationship between the University and the Sponsor, you will be given that form as well. You should review both agreements carefully before choosing to sign them. Please note that you do NOT have to agree to sign the Participation Agreement or any accompanying non-disclosure agreement; if you choose not to do so, you will be assigned equivalent work by the Program Director in place of one of these externally-sponsored Practicum projects.

The standard sponsor agreement grants a non-exclusive license to the sponsor for any materials produced for the sponsor during the Practicum. The University cannot grant exclusive rights to the sponsor because under the University Intellectual Property Policy, the students retain certain rights. Some sponsors, particularly venture-financed companies however, require full rights, which they can obtain by buying the students' rights at the beginning of the Practicum. CMU is not involved in that negotiation and CMU cannot force you to sell your rights to the sponsor. If your sponsor wants to buy rights and you do not agree, you will be assigned to a different Practicum project.

Your team MUST provide a copy of its final Practicum presentation to the Program Director by August 25, 2017. If a team does not submit its final presentation, then no one on the team will be allowed to participate in the graduation ceremony on August 27.

Background: The Atlas Talent Agency (atlastalent.com), with offices in New York and West Hollywood, is the country's premier Commercial talent agency that represents actors who specialize in Voiceover and On-Camera work in Commercials, Documentaries, Movie trailers, Audio books, Animated films and Promo Announcements for the majority of Cable, Radio and TV stations in the U.S. It has over 700 clients, including Academy Award winner Kathy Bates and Emmy winner Lily Tomlin (who won for a voiceover role). As you can see from the company's logo, it enjoys a fun and funky approach to its business. The outputs of this Practicum should embody the same spirit.

Problem/Opportunity: A producer ("Buyer") approaches Atlas with requirements for a particular role. Atlas selects the talent ("clients") it feels are most suitable for the job. For voiceover, the agent emails the producer's audition text ("copy") to the client so that they may record it in their own studios. Requirements can be very detailed, e.g., such as a female, age 30-40, husky voice and a studio with ISDN. Selected clients send mp3s to the agent, who uploads chosen ones to an FTP site and sends a link to the buyer for review. For On-Camera, the producer's talent requirements are even more specific (hair color, height, black belt in karate etc.). Once the talent is booked, Atlas needs to invoice, collect, deposit, clear and pay the Client minus the agency fee. During a 2016 practicum, a CMU team developed a complete billing system for Atlas, called Compass. In this second practicum, the team will add the following new functions to the existing system: (1) quickly locate appropriate talent for a particular project (from an existing data base); (2) keep actors' schedules; (3) record talent bookings; and (4) pass data to the existing billing platform. Giving the interface to these new functions a 'cool factor' is one of the TOP priorities! Booking agents are generally not sophisticated computer users, so look and feel are critical.

Outputs: A prototype of Compass 2.0, a solution for talent agencies, that will replace and enhance the current version of Compass, whose current J2EE source code will be provided, to include:

- Initiate Voiceover Audition/Booking Process using the current Compass database, which will show all client information and the talent's availability
- Send an email list of chosen talent to buyers. The system must indicate: (a) whether the talent is available for the audition; (b) whether the talent is available for the shoot/record date(s); (c) whether the talent is free of conflicts (for example, someone who does voiceover for Coca-Cola cannot do work for Pepsi).
- Maintain the talent's schedule which will include events such as Book-outs, Auditions, Fittings, Rehearsal, Holds for a Booking, etc., in a manner similar to Google scheduling.
- Choose talent that has been selected from the submissions and move them from a Submission (in their calendar) to an Audition and all other Phases of the Acting/Booking process.
- Communicate with the talent via email to offer the Audition script or scheduling information.

Background Information: The Bank of New York Mellon Corporation (BNYM) is the largest bank in the world measured by assets under custody and administration, totalling over $30 trillion. It operates in 35 countries, employs over 50,000 people, and serves millions of investors. BNYM is a leader in technology innovation, operating with over 3000 applications and 6000 edge connections.

The Problem: Banking today utilizes large-scale technology with diverse computer applications. These applications are highly integrated upstream and downstream with varying levels of criticality with respect to business processes and interface mechanisms. Issues with one application could have implications in applications many layers away. When incidents occur, rapid impact assessment is critical, but the complexity of connectivity can quickly overwhelm traditional data analysis, leaving individual knowledge, intuition and diligence as the only alternatives for resolution.

Opportunity: Encode complex connectivity making it suitable for human comprehension. Design a solution to deliver information to human decision makers quickly and effectively.

- Graph theory and network analysis have progressed significantly over the past two decades, and now offer the opportunity to encode this complexity.

Generated DNA

- In large-scale command centers, like the North American Aerospace Defense Command (NORAD), complex events are visually depicted as well-understood maps where the connected complexity of geological locations are encoded.
- At BNYM's major incident command operations, major incident occurrences and other events, such as system upgrades, can be plotted onto application DNA maps (application-connectivity-encoded network maps). The DNA maps are network analysis graphs with algorithms applied in layouts and by lineage, and visual cues applied for differentiation and grouping.

Event Overlay
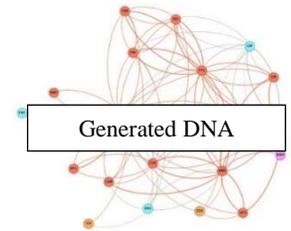
Input:
- The Application nodes/edges data is static and provided by existing application.
- The overlay data is real-time and provided by existing application.
- A DNA mapping prototype via Gephi (an open source graph visualization system) is complete.
- All data and artifacts will be provided to the Practicum team, as well as all desirable supervision, collaboration, and support.

Output: A working prototype web component easily incorporated into an existing web application, with the ability to:
- Generate a network graph diagram (the DNA map) of an application or groups of applications, with algorithms and differentiators applied (open-sourced or team-generated)
- Allow for the overlay of event data on a chosen DNA Map
- Provide for open platform and accessibility (API driven)

Background Information: The Bank of New York Mellon Corporation (BNYM) was formed in 2007 through the merger of the Bank of New York and Mellon Financial. It is the largest bank in the world measured by assets under custody and administration, which total over $30 trillion. It employs over 50,000 people. The firm operates in 35 countries and serves over 200,000 professional users and millions of investors.

The Problem: BNY Mellon processes large amounts of data on a daily basis. This dataset is of immense value and provides a potential revenue opportunity. The challenge is that data is not easy to access due to privacy, security and technical reasons such as cross-platform communication. Data is owned by multiple business units and thus consolidation requires coordination and agreement from multiple stakeholders. In addition, a good deal of the data is unstructured and using it effectively requires detailed familiarity with the bank's business processes. Currently, business users leverage configurable technologies like Excel for data sampling and analytics. Most of the business logic and underlying assumptions are embedded within those spreadsheets and thus this work cannot be leveraged for a higher level of analysis. Most of the data analysts do not have access to big data tools that would permit scaled analysis on larger datasets. Lack of a convenient data management platform to allow users to be able to build, collaborate, leverage existing algorithms represents an impediment to innovation and a wasted opportunity.

The Opportunity: The vision is to build a web-based analytical platform which lets business users build and share algorithms easily. This will free business users from any dependency on engineers and will enable them to perform analytics on their own. The platform will not only contain code along with explanatory text but also provide a seamless way to subscribe to various datasets that will be used to process that data. This includes all transformation and statistical modeling using Hadoop/Spark, Python-based data science libraries. All the engineering complexity needs to be hidden from the users so that they can focus on building strategies by combining packaged components.

Outputs:
A working prototype of a web-based platform which provides users within BNY Mellon the ability to conveniently leverage enterprise data and associated algorithms. The complexity of big data needs to be managed by the system to allow talented users to think freely and build strategies. This platform will be built using existing open source products. It will allow users to seamlessly integrate with existing BNY Mellon data services (EDS). Users of these data feeds will have access to associated algorithms to get started. The data will be secured using the BNY Mellon security model to ensure that confidential data is protected. All the algorithms will be saved into BNY Mellon's version control system without business users having to worry about how this is accomplished. The entire platform should use APIs as a glue to connect all the open source products that will be part of this stack.

Background: CloudMinds (www.cloudminds.com), based in Silicon Valley, Japan and China, is dedicated to the idea that home robots will become ubiquitous but will require a great deal of intelligence to coexist with humans. It is currently impossible to build that intelligence into the relatively small size of a humanoid robot. CloudMinds aims to solve this problem by providing a cloud robotic AI called HARI (Human Augmented Robotic Intelligence). Not only can HARI leverage highly scalable cloud computing power to provide AI services to distributed robots, it can also store and share required knowledge to improve itself. HARI also provides an interface that allow human operator in the cloud to "guide" robots during hard to achieve tasks, allowing HARI to learn from demonstrations of humans, as well as from collective experiences of many robots. Proprietary network technology enables the robots to communicate with the cloud AI and cloud operator continuously. CloudMinds aims for worldwide deployment of robotic services backed by cloud AI HARI.

Problem: CloudMinds has been focusing on cloud-based human augmented robotics and AI technologies. However, cloud-based human operators rely on special tele-operated equipment, which will be hard to scale. One solution is to use a smart phone as the human robotic interface, Cloud AI HARI can crowdsource human guidance to robots during hard to achieve robotic tasks. Thus a large smart phone user base remedies the scaling up problem.

The smart phone operator must be able to see and hear what the robot sees and hears in real-time. The mobile app would allow a user to monitor, control and respond to the robot, either through direct manual control or through voice commands. Further, the cloud HARI must be able to identify and connect robots that require human assistance to available smart phone operators.

Guidance: CloudMinds will provide HARI technology, which includes video streaming, object recognition, smart voice (a smart speech engine), and the remote robot control interface. The focus is on using the HARI technology to control a humanoid robot named Pepper: view the video at https://www.youtube.com/watch?v=kCFYw8mIqcc. There is an engineering team at CMU actively working on Pepper, and can provide intermittent support. CloudMinds will also provide time windows for the team to test the Pepper robot remotely while building up to the final demo.

Project Phases: CloudMinds would like the team to help in three major phases:
    1) deploy and modify the HARI AI system in the cloud to control robots;
    2) program an android-based app for remote robot control and video streaming;
    3) integrate the android app with HARI for crowdsourcing human guidance.

Desired Output: A working prototype of web and mobile crowdsourcing app that interfaces with a Pepper robot and the cloud, having following features:
- Ability to see what the robot sees and hear what the robot sees and hears.
- Ability to issue manually controls the robots remotely with navigation, arm, and speech.
- Intuitive, non-verbal arm control using gesture on smart phones.

The app will be tested and demonstrated on the CloudMinds robot at CMU.

Background: CURANTIS, LLC, based in Chicago, is addressing the expanding caregiver crisis faced by families and their employers in caring for the elderly. Caregivers require comprehensive expertise, which many do not possess, and need extensive support services. To address this need, the company is developing a do-it-yourself (DIY) Software as a Service (SaaS) platform for caregivers, and an accompanying eldercare concierge service for national employers. CURANTIS was formed by the Managing Partner of the Corporate Venture unit of the largest U.S. health insurer, representing over 100 million lives, and a General Counsel with experience in media and family office environments.

Problem: Workers with caregiving responsibilities for an adult relative with a serious illness or disability make up an increasing proportion of the labor force, and cost employers over $40 billion annually through absenteeism and lost productivity. As the population ages, the dual responsibilities of work and family caregiving that affect over 30 million workers today are becoming overwhelming for families at all income levels. On average, employed caregivers work the equivalent of a full-time job on top of caregiving responsibilities. Of millennial caregivers (ages 18 to 34), nearly three in four hold paying jobs while providing care for an ill or aging family member. In addition to time and attention, caring for a declining parent often requires expertise in healthcare, insurance, financial/investment services, estate planning, and senior living, which most caregivers simply don't have. Although innovations in caregiving are emerging, no company has yet fully leveraged technology to address this critical problem.

Opportunity: A substantial market exists for a SaaS workflow, document, and communication management system – think Slack/Box for eldercare – to inform, support and enable caregivers. That same platform, if architected properly, could serve as the workflow management and customer relationship management (CRM) system for eldercare concierge offered through employers, enabling a care management team to support employees with caregiving, allowing them to remain productive at work. The largest health insurance system in the country is prepared to pilot such a program.

Challenge: Ultimately, CURANTIS wants to be able to incorporate voice interaction and gesture recognition because many elderly are not able to use keyboards and other traditional HCI modes.

Outputs: A working prototype of the SaaS eldercare concierge platform, including:
- A SaaS architecture capable of incorporating workflow, CRM and voice/gesture recognition addressing two user communities: (1) DIY employees; and (2) skilled professional caregivers
- A workflow management, messaging and document management platform capable of supporting modules for healthcare, financial management, estate planning and housing services, at least two of which should be prototyped.
- Demonstrable placeholders for educational and support content (including videos) to provide dynamic delivery of channel specific-content based on user context.
- Leverage imbedded AWS contact-center infrastructure componentry to support CRM with capability to have multiple caregivers / care teams access to one account, an integrated database w/multi-channel access including IVR/Voice, Web, Chat, Email, Fax, Video, Mail. Ability to leverage mobile two-factor authentication for document authorization, and caller ID/voice biometrics for authentication and personalization.

Background: Dick's Sporting Goods, Inc. (dicks.com), headquartered in Pittsburgh, is a full-line sporting goods retailer offering a broad assortment of brand name sporting goods equipment, apparel and footwear in a specialty store environment. A Fortune 500 company, Dick's has over 600 retail locations.

Problem: As with many companies, the mobile app represents the most engaging channel for Dick's Sporting Goods. For example, Dick's introduced MOVE, which allows customers to obtain rewards for having an active lifestyle by connecting to fitness apps such as Fitbit. Such channels of engagement have a strong influence on the greater success of the organization. However, they can also be negatively polarizing when a user experiences a poor interaction. As a result, incidents reported through the mobile app require daily human resolution, resulting in a large number of tickets per year. In addition, our customers view the physical stores, online, and the mobile app as one company and not distinct channels. This causes confusion and frustration when users report feedback and issues through an app when that channel is currently inadequate to service the issue.

Opportunity: One of the most interesting and untapped technologies now available is machine learning. By leveraging the vast amount of feedback data maintained by Dick's, an AI backend can be built to deliver an exceptional customer experience that will benefit both the user and the company. By training over past incidents and their resolution, an automated system can be developed that will enable Dick's to resolve many complaints and issues automatically, satisfying the customer immediately without requiring intervention by a human. This will increase customer satisfaction while reducing the cost to Dick's and minimizing the possibility of a poor outcome. The aim would be a 33% decrease in the number of customer-reported issues that require service by an employee as well as an overall decrease in the time required to resolve problems.

Output: A working prototype of a mobile-first solution, accessible both through the Dick's app and the Dick's website that can serve as the primary touchpoint for users with questions, feedback, or issues regarding all channels of Dick's Sporting Goods. This prototype should be able to scale, perform continuous learning, measure its own performance and be amenable to input from Dick's employees. More particularly, the following components are needed:
- Ability to mine Dick's historical database to develop an AI engine to resolve customer problems.
- Ability to match a new message to previous issues that have been resolved, suggesting possible resolutions in order of likelihood.
- Response to common questions with very high probability of success, e.g., "I placed an order 10 days ago. When can I expect it?"
- Smooth process for transfer to a human when the system is not sure it can resolve the problem.

Background: Idelic Tech (pronounced eye-DEL-ic) (www.idelictech.com) is a Pittsburgh-based spinoff of PITT-OHIO, a large Pittsburgh transportation and logistics company (www.pittohio.com). PITT OHIO operates several thousand trucks and trailers and has 3000 employees. It is deeply committed to safety and has government safety ratings far better than the national average. PITT-OHIO developed a software package called SafetyBox that accumulates a wide variety of data about drivers, traffic violations, results of roadside inspections and drug tests and information gathered by the vehicles themselves (e.g. telematics tracking speed data, hard braking, etc.) to identify problem drivers so corrective action can be taken. Largely because of SafetyBox, PITT OHIO has won numerous and prestigious safety awards, and was recognized by the American Trucking Association as operating one of the safest fleets in the U.S.

Problem: While SafetyBox gives PITT-OHIO a competitive advantage, the company recognized that the entire industry (and other users of highways) would benefit from better overall safety. Also, some of PITT-OHIO's competitors have already licensed the software, with the goal of reaching that level of excellence in safety and compliance. PITT-OHIO is not a software company and needed a partner to commercialize SafetyBox, so it sold the software to Carnegie Mellon graduates, two from the Tepper School of Business and two from the School of Computer Science, who then created Idelic with the goal of making SafetyBox responsive to the needs of the entire trucking industry. SafetyBox is now an independent product with PITT-OHIO as a customer.

Opportunity: A large amount of data is collected about truck drivers and their behavior from various different sources, including state departments of motor vehicles, observations by managers, reports from insurance carriers, and telematics (data recorded by vehicles, such as speed and location). Idelic also has access to a huge database of incidents, including those of PITT-OHIO and a Fortune 50 pharmacy and healthcare company which has been a major customer and user of SafetyBox for over seven years. Idelic wants the team to use AI and big data techniques, such a neural networks, to develop a system to anticipate safety problems before they occur. The databases will serve as training data for the system, which will identify at-risk drivers and potentially dangerous trucks, routes and freight terminals. This system will be integrated into SafetyBox, to be used by licensees to improve safety, reduce risk, and automate compliance.

Output: A working prototype of a predictive analytics model of road safety and driver behavior, trained on real data, and designed to be a component of SafetyBox. The training component must be built into the system so other carriers can use their own training data to customize the model. The system should be able to identify potential safety issues and explain the reasons it believes a problem may occur. This is critical because management must have enough trust in the system to initiate action. In operation, the system will continually ingest data from a carrier and make predictions. As incidents occur, each carrier's model will be adjusted appropriately.

The team will have access to real data and will be able to meet with people from Idelic and PITT-OHIO (which are in the same building) to identify system needs.

Background: InteloMed (www.intelomed.com) is a Pittsburgh-area health care company that offers the CVInsight® Patient Monitoring & Informatics System, a non-invasive monitoring system that provides real-time information about cardiovascular (CV) condition. The system has been approved by the U.S. Food and Drug Administration. A skin-contact sensor worn on the head communicates with a tablet PC that obtains the patient's pulse waveform and processes it using proprietary algorithms that detect various conditions that may require medical intervention. By measuring the body's arterial pulse waveforms, CVInsight can gauge both current and predicted physiologic response to physical exertion, psychological stress, disease, injury, and medical treatment and provide customizable alerts for earlier intervention before the patient even knows he or she is suffering from stress, before the patient's physical changes can be visibly observed, and most importantly, before the patient suffers greater harm to the heart or vital organs. CV Insight is currently used to improve treatment outcomes for dialysis patients and the intent is to expand its use with wearable sensors for patients suffering from hypertension, sleep apnea, chronic obstructive pulmonary disorder (COPD), and nervous system disorders

Problems: InteloMed currently uses only one type of sensor, which obtains a pulse waveform. This limits the type of data that can be collected. Recent improvements in sensor design now make it possible to employ multiple sensors non-invasively, including such non-contact sensors as cameras on phones, laptops and driver-oriented lenses in cars. Capturing images for medical purposes in this non-contact manner is an active area of research. It can measure of pulse rate, pulse strength, blood oxygen level and pulse irregularity. The integration of additional algorithms for compliance, respiratory stress, arrhythmia detection, pulse shape analysis, and autonomic dysfunction would provide a comprehensive suite for real-time cardiovascular monitoring and would improve CVInsight. Many situations could benefit from non-contact vital sign measurements, including long term care, home rehabilitation, and senior care. Currently the assessment of vital signs requires human involvement via home or office visitations. Daily camera monitoring could reveal subtle health changes and allow advance intervention in life-threatening conditions such as pneumonia and heart failure.

Opportunity: The utility of InteloMed's products would be enhanced if patient data from these new sensors could be captured and analyzed. The team will experiment with camera sensors to determine how they can be integrated into the company's products.

Outputs: (1) An evaluation of hardware for image acquisition (e.g. webcam, cell phone, Kinect), addressing noise, lighting, and image quality requirements
(2) Evaluation of the effectiveness of current image processing techniques to assess color changes associated with the "microblushes" that occur with each heartbeat, essentially re-creating the pulse waveform that is currently acquired with a wearable sensor.
(3) A demonstratable prototype tablet app that monitors camera data and reports the results of real-time analysis using the CVInsight® algorithm suite.

Background: Returnly Technologies, Inc. (returnly.com) is a San Francisco-based company that has solved an important eBusiness problem – handling returns of products ordered online.   Shoppers often want to return goods – they may be defective or the wrong size or maybe the shopper just changed her mind. For example, it is estimated that 35% of clothing ordered online is returned. The current process is inconvenient.   The shopper must obtain authorization to return the product and send it back.   The merchant must verify that the goods were previously ordered and paid for, then must wait to receive and check the goods before it can issue a refund or a store credit to the shopper. This process can typically take 20 days. Returnly does it instantly, benefiting both shoppers and merchants.

Returnly maintains a "returns center" on the merchants' website, which has a record of all shopper purchases. The shopper who wants to return an item visits the returns center, selects the item to be returned and specifies a reason for the return. The software produces a return label, which the customer prints at home, attaches to the product, and sends it back. As soon as the label is printed, Returnly issues an electronic credit for the full value of the item, which the customer can use to purchase a replacement item. If no replacement is ordered, the customer can receive a cash refund from the merchant. The label includes a QR code. The expectation is that the customer will use the credit right away, and in doing so will possibly spend more than the amount of the credit, thus increasing the merchant's sales. That result is much less likely with a 20-day delay. Returnly integrates smoothly with online stores built on the Shopify (shopify.com) platform.

Problems: When the merchant verifies that the item has been returned, Returnly bills the merchant for the refund. Back-end processing of returns at the merchant's warehouse is awkward. When the return is received at the warehouse, the merchant must note in a desktop app that the product corresponding to Returnly's shipping label has been returned. Returnly wants the team to implement a mobile app with a QR-code scanner for seamless handling of returns, including updating of inventory, marking the shopper's record as "received", and sending an acknowledgement to the shopper – all with one QR-code scan. The solution should also provide useful information to the merchant, such as where the product should be reshelved, before the return package is even opened.

Opportunities: (1) Neither the merchant nor Returnly actually transports the returned items. That is often done by Newgistics (newgistics.com) or other logistics providers. Returnly needs to communicate with the logistics provider to determine whether and when a return has reached the merchant's warehouse.
(2) Many large merchants implement online stores using NetSuite (www.netsuite.com), an ecommerce platform that maintains order records and can issue refunds. It is important for Returnly to interface with NetSuite for proper processing of returns.

Outputs: (1) An API to support the operations needed to process a return when the item is received at the merchant's warehouse.
    (2) A connector for interacting with NetSuite to access order information.
    (3) A demonstratable mobile app that uses the API and the NetSuite connector and allows seamless checkin of returns at the merchant's warehouse.

CARNEGIE MELLON UNIVERSITY ("Carnegie Mellon")
EDUCATIONAL PROJECT AGREEMENT ("Agreement")

Company name ("**Course Sponsor**"):

Course title, campus location, semester & year ("**Course**"): 08-716, eBusiness Summer Practicum, Pittsburgh Campus, Summer 2017

Professor(s) teaching the Course ("**Professor(s)**"): Michael Shamos

Effective date ("**Effective Date**"):   June 26, 2017

End date of Agreement ("**End Date**"): August 31, 2017

Brief description of Course project idea (includes any materials to be supplied by and/or planned involvement of Course Sponsor) ("**Course Project**"): The Students will work on a project in the area of _____.

Financial contribution (if applicable) toward Course Project costs ("**Contribution**"):

* *

1. *Parties to this Agreement.* The Parties to this Agreement are:
   Students in the Course who elect to participate in the Course Project by signing the attached form of "Participation Agreement" (collectively, the "**Students**");

   Carnegie Mellon; and

   Course Sponsor.

   In this Agreement each may be called a "**Party**" and together they may be called "**Parties**."

2. *Purpose.* Carnegie Mellon appreciates the Course Sponsor's willingness to suggest project ideas for Carnegie Mellon's students and is excited to offer the ability for its students to participate in the Course Project described above. This Agreement documents the terms under which the Course Project will be conducted, including the rights and responsibilities of the various Parties.

3. *Ownership.* Students will retain ownership of the coursework they prepare and submit to the Professor(s) as part of the Course (the "**Student Work Product**"). Any materials provided by Course Sponsor for the Course Project will remain owned by Course Sponsor and may only be used by the Students and Carnegie Mellon for the Course Project unless otherwise permitted by Course Sponsor.

4. *Obligations of Carnegie Mellon.* Carnegie Mellon will provide to Course Sponsor copies of any and all Participation Agreements that have been signed by Students so that Course Sponsor is aware of all Parties to this Agreement. Carnegie Mellon will also provide (or cause the Students to provide) the Course Sponsor with copies of any and all Student Work Product within 60 days after the Course ends.

5. *Obligations of Students.* Each Student hereby grants to Course Sponsor a perpetual, non-exclusive, worldwide, royalty-free license to copy, modify, use, translate, publish and distribute his/her Student Work Product. Each Student also grants to Carnegie Mellon a perpetual, non-exclusive, worldwide, royalty-free license to publicly perform, publicly display, modify, create derivatives of and otherwise use for academic, educational, administrative or research purposes (a) any and all Student Work Product, and (b) any and all Recordings (as defined below).

6. *Obligations of Course Sponsor.*   Course Sponsor will pay any Contribution specified above in full in U.S. Dollars within thirty (30) days after the Effective Date and will also provide any and all materials and/or support for the Course Project specified in the description of the Course Project above.

   In addition, Course Sponsor understands and agrees that it will be given access to materials prepared as part of an educational course. If Course Sponsor elects to make use of any such materials, Course Sponsor understands that it is at Course Sponsor's sole risk and that neither the Students nor Carnegie Mellon can be responsible for the consequences of such use. As a result, Course Sponsor agrees to defend, indemnify and hold harmless Carnegie Mellon, its trustees, officers, employees, Students, attorneys and agents ("**Carnegie Mellon Parties**") from and against any and all liability, damage, loss or expense (including reasonable attorneys fees and expenses) incurred by or imposed upon any or all Carnegie Mellon Parties in connection with any claim, suit action or demand arising out of or related to any exercise of the rights and licenses granted or provided to Course Sponsor under this Agreement (including the license to the Student Work Product). This indemnity will apply to claims under any theory of liability (including but not limited to actions in the form of tort, warranty, or strict liability, or violation of any law) and regardless of whether such action has any factual basis.

7. *Disclaimers.* ANY AND ALL INFORMATION, MATERIALS, SERVICES, INTELLECTUAL PROPERTY AND OTHER PROPERTY AND RIGHTS GRANTED AND/OR PROVIDED PURSUANT TO THIS AGREEMENT (INCLUDING ANY STUDENT WORK PRODUCT), ARE GRANTED AND/OR PROVIDED ON AN "AS IS" BASIS. NO PARTY MAKES ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, REGARDING ANY MATERIALS PROVIDED BY IT, AND ALL SUCH WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.   WITHOUT LIMITING THE GENERAL NATURE OF THE PRIOR SENTENCE, NEITHER CARNEGIE MELLON NOR ANY STUDENT MAKE ANY WARRANTY OF ANY KIND RELATING TO EXCLUSIVITY, INFORMATIONAL CONTENT, ERROR-FREE OPERATION, RESULTS TO BE OBTAINED FROM USE, FREEDOM FROM PATENT, TRADEMARK AND COPYRIGHT INFRINGEMENT AND/OR FREEDOM FROM THEFT OF TRADE SECRETS WITH RESPECT TO THE STUDENT WORK PRODUCT. COURSE SPONSOR IS PROHIBITED FROM MAKING ANY EXPRESS OR IMPLIED WARRANTY TO ANY THIRD PARTY ON BEHALF OF CARNEGIE MELLON OR ANY STUDENT RELATING TO ANY MATTER, INCLUDING THE APPLICATION OF OR THE RESULTS TO BE OBTAINED FROM THE INFORMATION, MATERIALS, SERVICES, INTELLECTUAL PROPERTY OR OTHER PROPERTY OR RIGHTS GRANTED AND/OR PROVIDED TO IT PURSUANT TO THIS AGREEMENT. NEITHER CARNEGIE MELLON NOR ANY STUDENT SHALL BE LIABLE TO EDUCATIONAL PROJECT SPONSOR OR ANY THIRD PARTY FOR LOSS OF PROFITS OR FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY REASON WHATSOVER ARISING OUT OF OR RELATING TO THIS AGREEMENT (INCLUDING ANY BREACH OF THIS AGREEMENT), EVEN IF CARNEGIE MELLON OR THE STUDENT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR HAS OR GAINS KNOWLEDGE OF THE EXISTENCE OF SUCH DAMAGES. COURSE SPONSOR AGREES THAT IT WILL NOT MAKE ANY WARRANTY ON BEHALF OF CARNEGIE MELLON OR ANY STUDENT, EXPRESS OR IMPLIED, TO ANY PERSON CONCERNING THE APPLICATION OF OR THE RESULTS TO BE OBTAINED WITH ANY MATERIALS, SERVICES, INTELLECTUAL PROPERTY AND OTHER PROPERTY AND RIGHTS GRANTED AND/OR PROVIDED PURSUANT TO THIS AGREEMENT (INCLUDING ANY STUDENT WORK PRODUCT).

8. *Miscellaneous.*

   8.1.   The term of this Agreement will begin as of the Effective Date and end on the End Date unless sooner terminated as permitted under this Agreement. The actual Course Project will be conducted during the scheduled Course dates and times, which may be different than the Effective Date and/or End Date of this Agreement.

   8.2.   Each Party agrees that it will not use the name, trademark, or other identifier of any other Party for any advertising, promotion, or other commercially related purpose in connection with this Agreement except with the prior written approval of the relevant Party.

   8.3.   Students (and Course Sponsor, to the extent it is present in the classroom when recordings are being made) hereby grant Carnegie Mellon permission to make audio and/or video recordings of the work performed by them and/or their participation during the Course (the "**Recordings**") and agree that

13

Carnegie Mellon shall have the perpetual, irrevocable, worldwide right and license to publish, reproduce, exhibit, distribute, broadcast, edit and/or digitize the Recordings in whatever form for Carnegie Mellon's internal, academic or research purposes relating to the Course and/or similar educational projects.

8.4.   Unless otherwise indicated elsewhere in this Agreement, no Party to this Agreement may assign or transfer any rights or obligations from this Agreement without the prior written consent of the other Parties. Any attempted assignment in violation of this Section will be null and void.

8.5.   Unless otherwise indicated elsewhere in this Agreement, all notices and communications in connection with this Agreement will be addressed to the Carnegie Mellon and Course Sponsor officials who sign this Agreement at the addresses noted below the signature lines, and to the Students at the addresses they list on their respective Participation Agreements.

8.6.   Either Carnegie Mellon or Course Sponsor may terminate this Agreement by giving at least thirty (30) days prior written notice to the other. In addition, Carnegie Mellon may terminate this Agreement by giving written notice to Course Sponsor in the event Course Sponsor fails to pay the Contribution by the timeframe required. In the event that Carnegie Mellon elects to terminate this Agreement due to Course Sponsor's nonpayment or breach of this Agreement, Course Sponsor forfeits the license rights otherwise granted to it under Section 5 above. Any Students may withdraw from and/or drop the Course as permitted by Carnegie Mellon practices and policies, provided that any and all Student Work Product provided to Carnegie Mellon by such Student prior to withdrawal may be used by Carnegie Mellon and Course Sponsor consistent with the terms of this Agreement. Any provision which by its nature would naturally survive the expiration or termination of this Agreement will do so (including but not limited to indemnification obligations).

8.7.   Any amendments to this Agreement must be in writing and signed by authorized representatives of Carnegie Mellon and Course Sponsor (and, to the extent such amendments affect the rights or obligations of any Students, also by such Students).

8.8.   Nothing contained in this Agreement shall prevent either Course Sponsor, Carnegie Mellon or any Student from entering into projects with third parties which are similar to the Course Project, or from independently developing (either through third parties or through the use of its own personnel), or from acquiring from third parties, technologies or products which are similar to and competitive with intellectual property resulting from the Course Project.

8.9.   If any portion of this Agreement is determined by any court or governmental agency of competent jurisdiction to violate applicable law or otherwise not to conform to requirements of law, then the rest of the Agreement will remain in effect and the parties will substitute a suitable and equitable provision for the invalid/unenforceable provision in order to carry out the original intent and purpose of the original Agreement.

8.10.   In all matters relating to this Agreement, the Parties are acting as independent contractors and no Party will represent that it has any authority to assume or create any obligation or warranty on behalf of the other Parties and/or to represent the other Parties as agent, employee or in any other capacity.

8.11.   The section headings herein are inserted for convenience only and shall not be construed to limit or modify the scope of any provision of this Agreement. Nothing in this Agreement, express or implied, is intended to or shall confer upon any person or entity other than the Parties any right, benefit or remedy of any nature whatsoever under or by reason of this Agreement.

8.12.   This Agreement shall be governed by the laws of the Commonwealth of Pennsylvania without regard to the conflict of laws provisions. All claims and/or controversies of every kind and nature arising out of or relating to this Agreement, including any questions concerning its existence, negotiation, validity, meaning, performance, non-performance, breach, continuance or termination shall be settled exclusively in the United States District Court for the Western District of Pennsylvania or, if such Court does not have jurisdiction, in any court of general jurisdiction in Allegheny County, Pennsylvania and each party

consents to the exclusive jurisdiction of any such courts and waives any objection which such party may have to the laying of venue in any such courts.

8.13.   This Agreement and the executed Participation Agreements constitute the entire agreement among the Parties and supersede all previous agreements and understandings relating to the subject matter of this Agreement.

Intending to be legally bound, the Students, Course Sponsor and Carnegie Mellon agree to the terms and conditions of this Agreement as of the Effective Date.

COURSE SPONSOR: CARNEGIE MELLON UNIVERSITY:

By: _____   By: _____

Name: _____   Name: _____

Title: _____   Title: _____

Address for notices: Address for notices:
                                                     Office of Sponsored Programs
                                                     Carnegie Mellon University
                                                     5000 Forbes Avenue
                                                     Pittsburgh, PA 15213

Address for invoices:

Attachment - Form of Participation Agreement

PARTICIPATION AGREEMENT

Course title, campus location, semester & year ("**Course**"): 08-716 eBusiness Summer Practicum (Summer 2017, Pittsburgh Campus)

Professor(s) teaching the Course ("**Professor(s)**"): Michael Shamos

Company name ("**Course Sponsor**"): Design Center Pittsburgh

* *

As a part of the Course, you have the opportunity to participate in an educational project suggested by the Course Sponsor listed above.

BY SIGNING THIS FORM, YOU HEREBY AGREE TO BE LEGALLY BOUND AS A "STUDENT" TO THE TERMS AND CONDITIONS OF THE EDUCATIONAL PROJECT AGREEMENT ATTACHED TO AND INCORPORATED INTO THIS PARTICIPATION AGREEMENT. *PLEASE READ THE EDUCATIONAL PROJECT AGREEMENT CAREFULLY BEFORE YOU DECIDE WHETHER TO SIGN THIS PARTICIPATION AGREEMENT. THIS IS A LEGALLY-BINDING AGREEMENT AND INCLUDES OBLIGATIONS YOU MUST FULFILL (INCLUDING THOSE IN THE ATTACHED EDUCATIONAL PROJECT AGREEMENT). IF YOU SIGN THIS AGREEMENT AND THEN DO NOT ABIDE BY YOUR OBLIGATIONS, YOU COULD FACE LEGAL ACTION.*

STUDENTS TRADITIONALLY RETAIN COMPLETE OWNERSHIP AND CONTROL OF THE WORK THEY CREATE IN THE CLASSROOM—HOWEVER, IF YOU SIGN THIS FORM AND CHOOSE TO PARTICIPATE IN THE COURSE PROJECT, YOU WILL BE GRANTING CERTAIN RIGHTS AND LICENSES TO YOUR COURSEWORK (AS MORE FULLY DESCRIBED IN THE ATTACHED EDUCATIONAL PROJECT AGREEMENT).

IF YOU DO NOT WISH TO PARTICIPATE IN THE COURSE PROJECT AND/OR DO NOT AGREE WITH THE TERMS CONTAINED IN THIS DOCUMENT AND THE ATTACHED EDUCATIONAL PROJECT AGREEMENT, YOU DO NOT HAVE TO SIGN THIS DOCUMENT. YOU MAY PERFORM AN ALTERNATIVE PROJECT AS DIRECTED BY THE PROFESSORS IN ORDER FOR YOU TO FULFILL YOUR COURSE REQUIREMENTS.

By signing below, you represent and warrant that you are at least 18 years old.

STUDENT

By: _____

Printed Name:

Pittsburgh (Local) Address:
(do not list your campus office or building)

Permanent (Home) Address: