

Communication Tools for Moving Research to Practice

The App Factory: An innovative approach to development of mobile accessibility and assistive technology apps

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The App Factory: An Innovative Approach to Development of Accessibility and Assistive Technology Mobile Apps

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Wireless RERC and LiveWell RERC



Presentation Overview

1. Challenges of tech development and transfer in an era of rapid advancement
2. Background of the App Factory
3. The App Factory process and history to date
4. Examples
 - Pay for performance: Contracts and milestones
 - App Factory products (videos)

Wireless RERC



- Founded in 2001
- Partnership between Georgia Tech and Shepherd Center
- Mission of the Wireless RERC –
 - promote access to and use of wireless technologies by people with disabilities
 - encourage adoption of Universal Design approaches in future generations of wireless technologies.

LiveWell RERC



- Founded in 2015
- Partnership among Duke University, Shepherd Center, and Northeastern University
- Missions
 - Promote access to existing and emerging ICT for people with disabilities
 - Develop and validate ICT applications to improve the capacity for independent living and community participation

The Challenge

- Forecasting technology developments and changing user needs over a multiyear funding cycle
- The rise of application programming interface (APIs) and mobile “apps” as a means for rapid technology development of customized apps
- Priorities of "academic" developers

The App Factory Model

- Two primary goals
 - 1) Bring highly talented and prolific private-sector developers into the process of designing apps that address AT user needs.
 - 2) Establish a “pay-for-performance” mechanism to encourage successful commercialization of useful apps.

Complementary objective: To create a model for consumer engagement in the development process.

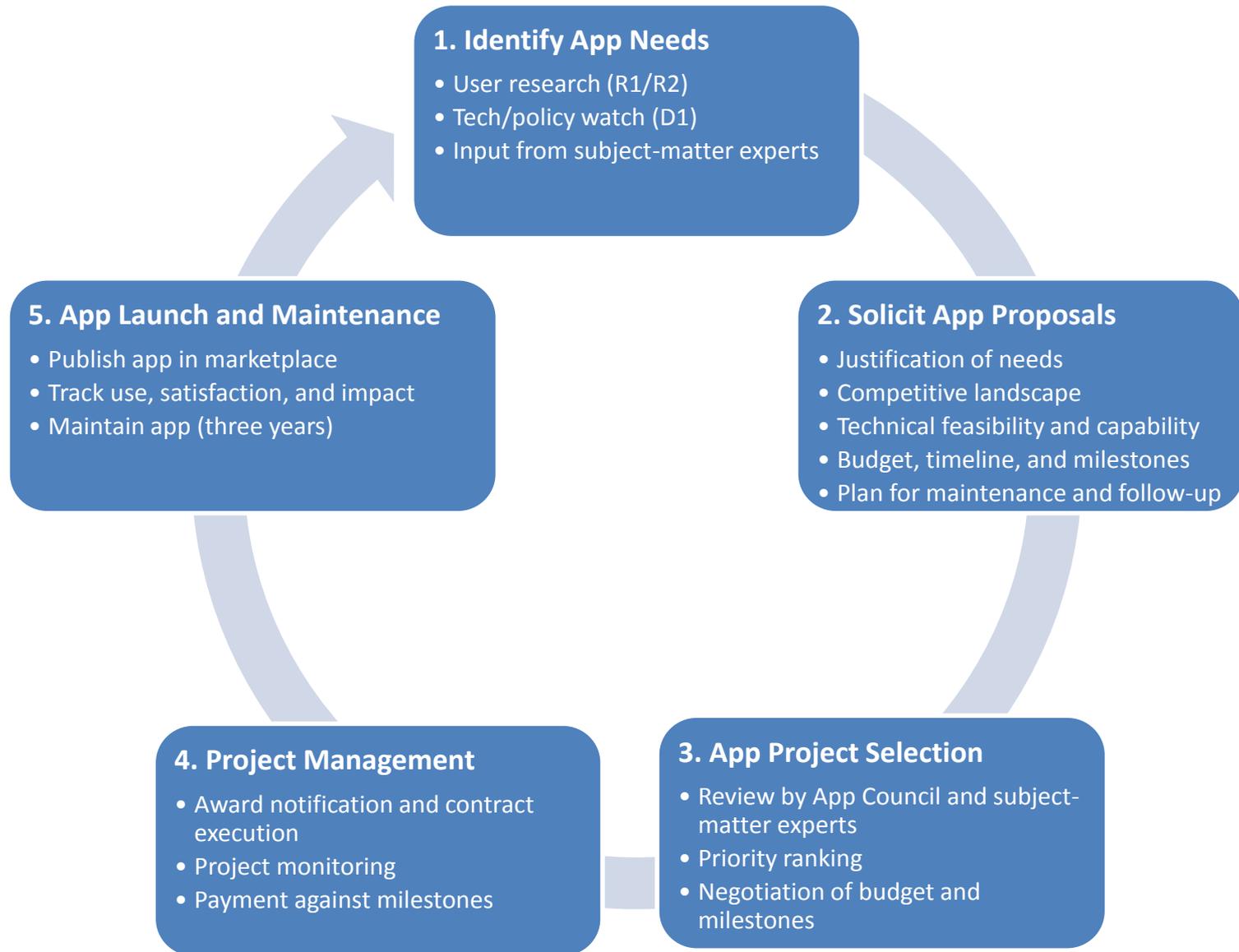
App Factory Criteria

- App must address an important accessibility or assistive technology need.
- App is unlikely to be developed in the commercial marketplace (e.g., “orphan” app).
- App is technically feasible.
- Projected “lifetime” or impact of the app justifies the investment.
- App does not duplicate existing apps.

App Factory Proposal

- Must demonstrate:
 - Need: importance of app for consumer
 - App doesn't already exist
 - Feasible with available tech, time, and money
 - Developer has the technical capability to build it
 - Efforts to make sure:
 - App is usable by consumer.
 - Consumers like it.
 - It will have lasting impact.

LiveWell RERC – App Factory (D2-A) Tech Transfer Process



App Factory outputs first 3 years

- Funded 4-6 app projects a year
- Budgets range between \$5,000-\$30,000
- Roughly 70/30 split of private-sector vs. academic developers
- 11 of 16 funded projects produced commercially available apps
- 7 accessibility apps; 9 assistive apps
- Over 600,000 downloads in 4 years

Project Title	Developer	Direct cost*	Downloads
Year 1			
BrailleTouch	BrailleTouch, Inc/GA Tech	\$16,000	18,616
Georgia Read More ASL	GA Tech/GA Public Television	\$9,000	Beta
IDEAL Group Reader	IDEAL Group	\$14,500	14,535
IDEAL Group Accessible App Installer	IDEAL Group	\$10,000	535,160
Mobile Assistive Listening System	Inclusive Technologies	\$3,500	Exploratory
Year 2			
AccessNote	Am. Foundation for the Blind	\$19,000	6,050
Citra	Tony Wells Fdn/Ohio State U.	\$15,000	200
IDEAL Currency Identifier	IDEAL Group	\$5,000	6,381
IDEAL Group Reader – Mathwriting Recognition	IDEAL Group	\$7,500	11,015
Impromptu Upgrade	Ohio State University	\$12,973	2,764
PicTalker	Duke University	\$11,600	Beta
Smart Steps	Smart Steps, Inc.	\$19,742	2,401
Year 3			
Continuous Tongue Drive	GA Tech Bionics Lab	\$28,269	Beta
IDEAL Document Knowledge Miner	IDEAL Group	\$15,052	259
RheumMate	GA Tech/Emory University	\$10,000	Beta
ZyroSky Switch Accessible Game	Zyrobotics	\$17,752	2,779

App Factory outputs - Last 2 years

Wireless RERC

- Funded 9 app projects (8 completed)
 - Hearing, dexterity, cognitive, developmental disabilities
 - Budget range: \$12,000 - \$24,500

LiveWell RERC

- Year 1 – Funded 3 app projects:
 - 2 cognitive assist, 1 manual-dexterity rehab
- Year 2 – External proposals currently under review

Advantages of This Approach

- Rapid development and deployment
- Leverages existing app marketplaces
- Pay-for-performance model provides incentives to get the product to market
- Encourages development of “orphan” apps
- Consumer engagement improves relevance and impact of apps
- Secondary dispersal of \$ a model for others?

Potential Limitations of Approach

- Some apps less successful in terms of downloads (but that may be okay)
- Limited shelf life of apps in general
- Notable differences in success of private-sector vs. academic developers
- Ability to contract with multiple vendors can be a challenge for some

Challenges Measuring Impact

- Downloads do not indicate use: Average monthly users or average monthly use time might be better indicators, but still indirect measures.
- Potential user base may be small: Downloads may be relatively few, but impact could be high.
- For projects developed by external teams, the RERC must ask each team individually to provide download data.

Pay for Performance: Contracts and Milestones

ZyroMath by Zyrobotics (Contract value = \$17,620)

Integrated switch-accessible runner game for children that keeps them motivated while learning basic math.

- **Milestone 1:** \$5,000—Completion of user interface development
- **Milestone 2:** \$4,000—Development of full functionality of app, including:
 - a) A tool for automatic assessment of each child's motor abilities (with respect to interaction) for creation of a near-optimal set of parameters to configure the app's settings, and
 - b) A graphical interface for parents, clinicians, and teachers that provides long-term reporting on the child's progress and performance
- **Milestone 3:** \$4,000—Completion of user testing and usability fixes
- **Milestone 4:** \$4,620—Product launch and availability on both Android and iOS operating systems

Pay for Performance: Contracts and Milestones

Smart Steps enhancements (Contract value = \$23,475)

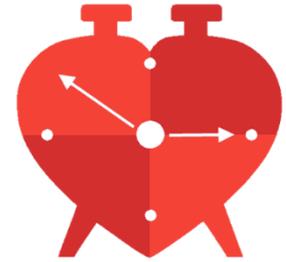
Mobile application for individuals with cognitive disabilities to reduce anxiety, solve everyday problems, and increase independence using decision trees and personalized backup support.

- **Milestone 1:** \$7,500—Add private and public decision tree database; license management for groups; admin portal to associate files so that trees can be assigned and to buy a set of licenses; ability to store cell numbers for texts messaging
- **Milestone 2:** \$7,500—Read-aloud button in the app; customize colors for the text boxes and tips; enhance login workflow; payment portal for credit card processing
- **Milestone 3:** \$8,475—Beta testing and release: Available through Google Play, Amazon apps

Examples of App Factory Outputs

Tetra Alarm

Chillaxing Software



Pow!r Mount

BlueSky Designs



BreatheWell on Watch

Shepherd Center



Examples of App Factory Outputs

<https://youtu.be/qK0Ae9sA3ek>

Pow!r Mount

BlueSky Designs



The Pow!r Mount App controls the Pow!r Mount motorized mounting system developed by BlueSky Designs.

- Pow!r Mount is a configurable system of motorized joints that includes dual-powered arms, single-powered arm, or hybrid system with a single manual and single motorized arm.
- The app is accessible via touch or switched access (single switch or two-switch).
- App allows preset target positions or custom adjustment
- Mounting system accommodates tablets, smartphones, etc.

Examples of App Factory Outputs

Video!

BreatheWell on Watch

Shepherd Center



Android Wear smartwatch app to assist individuals with mild traumatic brain injury (mTBI) and posttraumatic stress disorder (PTSD) to manage stress through diaphragmatic breathing.

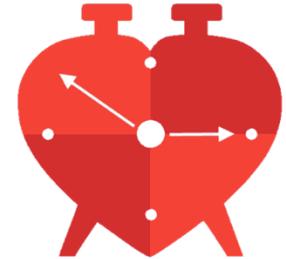
- Smartwatch platform allows for **quicker access and more discreet use of a breathing therapy aid** than is currently provided by apps running on smartphones and tablets.

Examples of App Factory Outputs

Video!

Tetra Alarm

Chillaxing Software



Tetra Alarm allows you to easily set reminders for periodic, daily events. Alarms are easy to set and intuitive.

- Multiple alarms can be set to signal a user to complete necessary tasks throughout their day.
- Alarms can be signaled by various methods (audible, visual, or tactile) and can be customized to attract your keenest senses.

App Factory RFP (currently closed)



Assistive and Accessible Mobile Applications Call for Proposals

Through a grant from the National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR), the Rehabilitation Engineering Research Center for Community Living, Health and Function (LiveWell RERC) seeks to enhance the use and usability of wireless technologies for people of all ages and abilities. The LiveWell RERC's mission is to promote ICT access to existing and emerging technologies for all people regardless of ability; and to develop and validate ICT applications to improve the capacity for independent living and community participation. Included in this effort is the RERC's mobile applications development project, the "App Factory".

<http://www.livewellrerc.org/2016appfactoryrfp>

Thank You!



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