KT4TT Update

A Publication of the Center on Knowledge Translation for Technology Transfer
Volume 3, Issue 1, 2011

Product Utilization Support and Help (PUSH) AWARD

The Center on Knowledge Translation for Technology Transfer (KT4TT) is pleased to announce that Assistive Technology Partners' (ATP) Rehabilitation Engineering Research Center for the Advancement of Cognitive Technologies (RERC-ACT) at the University of Colorado (CU) School Of Medicine is the recipient of a 2011 PUSH award. Cathy Bodine, PhD is the Project Director of the RERC-ACT. Dr. Bodine and her RERC-ACT team were selected for the award for their application of Knowledge Translation (KT) and Technology Transfer (TT) 'best practices' in utilizing the University of Colorado Technology Transfer Office's (TTO) business, and technology transfer expertise on all of their projects throughout their grant cycle.

The Product Utilization Support and Help (PUSH) award is a peer-to-peer dissemination activity that is based on the identification and distribution of 'best practice' approaches to the development, transfer and/or production processes by National Institute on Disability and Rehabilitation Research (NIDRR) technology grantees. The goal is to offer exemplars of research utilization that have been proven effective to the broader NIDRR community.

The RERC-ACT team performed exemplary work in three areas related to Knowledge Translation for Technology Transfer, each of which will be referenced in the following project summary:

1) Utilization of a best practice of strategically pursuing a collaborative and open relationship with their University's Technology Transfer Office (TTO) allowing them to save financial as well as faculty resources while meeting their grant program requirements.

2) Implementation of a formalized stage/gate product development model as a basis for their projects' technology transfer plans and collaboration with other NIDRR grantees in designing the format for those plans.

3) Building their business case and establishing their development plans very early on in the product development process allowing them to address an unmet need with a technology-based solution to improve the quality of life for persons with disabilities.

Organizational Background

Assistive Technology Partners (ATP) has been a program of the University of Colorado, Anschutz Medical Campus since June, 1996. Over the years, ATP has evolved from a single grant (Colorado Assistive Technology Act Project, 1989 - present) with four faculty, to a robust program of 27 faculty and staff including clinicians (OTR, PT, SLP), educators, engineers (CE/CS, EE, ME, Biomed, and Digital Media), vocational evaluator, horticultural therapist, and students from a multiplicity of backgrounds. Today, ATP is home to five engineers and a digital media specialist. Because of their emphasis on partnerships, ATP has contractual relations with an additional nine engineers located throughout North America. They are also partnered with three worldwide technology corporations and many Assistive Technology (A/T) manufacturers. The addition of engineering resources to their team gave them the ability to compete successfully for NIDRR's Rehabilitation Engineering Research Center for Advancing Cognitive Technologies (RERC-ACT).

Collaborative Relationship between CU TTO and the RERC-ACT

TT offices on any university campus have as a central goal to create an entrepreneurial enterprise benefitting the university. That means it is in their best interest to support academic commercialization efforts. It is also in the best interest of faculty researchers and developers to initiate and strategically pursue a collaborative and open relationship with their individual TTO. The RERC-ACT's approach was to use their Business Development Advisory Committee as one tool enabling continued relationship building with the TTO as well as a vehicle to ensure any and all products created through the RERC-ACT and/or ATP are credible and transferable by the CU TTO.

Through this relationship the CU TTO administrative backbone provides support—Intellectual Property (IP) administration, marketing and communications, policy development, legal advice, compliance, and financial management—and operational engagement to the RERC-ACT. Specifically, the TTO provides the RERC, without up-front costs, the following services:

- Advises faculty on IP issues
- Fosters inventor participation in the technology transfer process
- Advises campus researchers about the technology transfer process through a variety of means including seminars, monthly newsletter and special events
- Solicits and analyzes invention disclosures from faculty, students, and staff
- Analyzes commercial feasibility of University IP and helps devise subsequent strategies to commercialize IP
- Prepares and manages the transfer of "tangible research property" such as biological materials and assistive technology related research property
- Licenses patents and copyrights for commercial use and manages those licenses

Kate Tallman, Director, Technology Transfer Office is assigned specifically to work with Assistive Technology Partners and the RERC-ACT. In addition as a result of their partnership, the TTO also hires an MBA student to work directly with ATP and the RERC-ACT to develop work plans and other documents to support their TT efforts.

CU TTO assistance to the RERC-ACT also includes defining or refining the scope of the project, any and all IP issues that need to be addressed and developing a transfer or commercialization plan. At this time, there are five products 'in the pipeline' and they have already successfully transferred other products from their initial RERC-ACT funding cycle.

Implementation of a Formalized Stage/Gate Product Development Model

The first five-years of funding from the National Institute on Disability and Rehabilitation Research (NIDRR) for the Rehabilitation Engineering Research Center for Advancing Cognitive Technologies (RERC-ACT) began in November, 2004. One key component of the overall RERC program is to increase "transfer of RERC-developed technologies to the marketplace. The RERC must contribute to this outcome by developing and implementing a plan for ensuring that all technologies developed by the RERC are made available to the public" (p. 24, CFDA Number - 84.133E-4, 2004). Now in their second five-year round of funding (2009-2014), the RERC-ACT has moved into a much more extensive technology transfer phase.

The RERC-ACT technology transfer initiative fits extremely well within the overall goals and objectives of ATP's business planning. For development of their technology transfer plans, the RERC-ACT collaborated with the RERC on Accessible Public Transportation (RERC-APT), Carnegie Mellon University, and the KT4TT at the University of Buffalo utilizing their template for Technology Transfer plans. The table below illustrates the nine stages of research, development and production activities; and steps taken along the way as outlined by the Center on KT4TT in their Need to Knowledge (NtK) model. Interested readers can review the complete model, which also includes gates, tips, case study examples, supporting findings, and knowledge translation methods at http://kt4tt.buffalo.edu/knowledgebase/model/php.

Table One. Stages and Steps of the Technology Transfer Process.

Stage	Steps
STAGE 1: **Define Problem and Solution**	• 1.1 Opportunity for KT: Assess needs for device or service with input from relevant stakeholders from the six knowledge user (KU) groups. • 1.2 Identify a problem (need). Identify audience for solution. Identify context for both. • 1.3 Propose plausible solution (goal) to problem in the form of a device or service. • 1.4 Determine scope of project (role); output as conceptual discovery, prototype invention or device/service innovation? • 1.5 Consider path to market.
STAGE 2: **Scoping** (Initial screen to validate innovativeness and value to target markets)	• 2.1 Define innovation opportunity. • 2.2 Opportunity for KT: expanding on previously identified needs, perform preliminary valuability assessments (business, market and technical) on device/ service with input from stakeholders in the six KU groups. • 2.3 Identify potential barriers.
STAGE 3: **Conduct Research and Generate Research based Findings** (Create/find relevant knowledge) (Campbell & Stanley, 1963)	• 3.1 Opportunity for KT: Identify expertise needs and assemble transdisciplinary research team (I.e. methodologist, statistician, etc.). • 3.2 Identify specific knowledge gaps- purpose of research phase. • 3.3 Select appropriate research design and develop research plan (action research, grounded theory, co-operative research, clinical research, etc). • 3.4 Secure funding. • 3.5 Conduct research. • 3.6 Monitor and track quality. • 3.7 Refine process and optimize quality of results. • 3.8 Results - integrate findings. • 3.9 Conclusion – evaluate discovery in light of solution.
STAGE 4: **Build Business Case and Establish Development Plans**	• 4.1 Seek key co-development partners. • 4.2 Propose draft solution. • 4.3. Outline preliminary business case. • 4.4. Implement IP strategy in collaboration with technology transfer office or patent attorney. • 4.5. Assess regulatory, and reimbursement requirements. • 4.6. Opportunity for KT: Initiate key co-development practices. • 4.7. Assess resource needs and availability. • 4.8. Develop implementation plan. • 4.9. Secure resources for development. • 4.10. Allocate adequate resources. • 4.11. Gather, analyze and prioritize customer needs. • 4.12. Identify device/service features and specifications in light of production capabilities and component costs. • 4.13. Complete business case.

Stage	Steps
STAGE 5: Implement Development Plan	• 5.1. Build alpha prototype models. • 5.2. Monitor development process. • 5.3. Test alpha prototype models. • 5.4. Refine models.
STAGE 6: Testing and Validation (Prototype evaluation and refinement)	• 6.1. Test beta prototype with consumers in lab. • 6.2. Refine beta prototype models. • 6.3. Test refined beta prototype with consumers in field. • 6.4. Refine beta prototype models further.
STAGE 7: Production Planning and Preparation	• 7.1. Draft preliminary bill of materials. • 7.2. Develop materials plan. • 7.3. Estimate market needs and costs for production. • 7.4. Develop production and capacity plan. • 7.5. Plan and schedule engineering. • 7.6. Plan and schedule tool and process design. • 7.7. Review costs using preliminary BOM. • 7.8. Review IP protection and obtain final approval from regulatory and reimbursement bodies - if needed. • 7.9. Finalize distribution logistics.
STAGE 8: Launch	• 8.1. Initiate production and launch device/service. • 8.2. Monitor performance. • 8.3. Provide device/service support. • 8.4. Troubleshoot and correct problems.
STAGE 9: Post-Launch Review	• 9.1. Continue production, monitoring and support. • 9.2. Troubleshoot and correct problems. • 9.3 Review performance against expectations.

Building the Business Case and Establish Development Plans Early On

The RERC-ACT utilized this format as a base for the development of their technology transfer plan. The key difference in their plan at the University of Colorado is their direct access to CU TTO staff, who were able to invest a great deal of time into planning activities during STAGE 1 and 2. For example, STAGE 4: Build Business Case and Establish Development Plans, begins much earlier within their process. In fact, one of their first steps is to begin to think about and plan for a business case very early in the process—almost as soon as an idea or project is floated to the team. For example, planning for the RERC-ACT included alerting the CU TTO to their proposed projects and their 'first guess' as to a business case prior to submission of the grant proposal.

Actively engaging in the commercialization process as a university faculty member can be a long, arduous and expensive endeavor. Most faculty are not well-versed in the commercialization process, nor is this a particular interest area for many. Often, faculty time and financial resources are exhausted by the time externally funded research and development activities are completed. However, it is a requirement of the NIDRR-funded RERC program and as such technology transfer is raised to a degree of importance that may be intimidating or appear unachievable by individual faculty members. This emphasizes the critical importance of establishing a well-defined working relationship with the university TTO.

SUMMARY:

This Center clearly leveraged available resources from their host institution, the University of Colorado, in utilizing the business and technology transfer expertise of their TTO. This allowed the RERC-ACT staff to focus their resources on their areas of expertise rather than in learning new business skills. It has allowed them to save tremendous financial as well as faculty resources and has enabled them to meet their grant program requirements. More importantly, it is creating opportunities for them to take what they are learning and doing and make it accessible to the very individuals they are committed to serving—persons with disabilities and their families.

The RERC-ACT received a monetary award in the amount of $1000 for providing us detailed information on their exemplary practices and for allowing us to showcase their 'best practice' product development approaches to the broader NIDRR community. In the future, the KT4TT will be searching for, and disseminating the work of, other NIDRR grantees who have demonstrated exemplary practices in the development, transfer and production of assistive technology thus ensuring that their research and development projects truly benefit people with disabilities.

The authors gratefully acknowledge colleagues who contributed to the concepts expressed herein. This is a publication of the Center on Knowledge Translation for Technology Transfer, funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education's Office of Special Education and Rehabilitative Services (OSERS), under grant number H133A080050. The opinions contained in this publication are those of the grantee and do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the federal government.