Researcher-Industry collaboration: Establishing and maintaining value-added partnerships

Hosted by: Lori Geist, ATIA Research Committee Chair

Speakers:

Lynn Gitlow, Ithaca College
Dianne Goodwin, BlueSky Designs
James Leahy, University at Buffalo
Kathleen Hanek, Ableware
David Arnott, Comforts of Home

August 23, 2016

ATiA Assistive Technology Industry Association

Introduction

- Research Committee Sponsored Webinar
- Assistive Technology Outcomes and Benefits (ATOB) Journal
  - September 2016, volume 10
  - January 2017, volume 11
- Featured Sessions at ATIA 2016 Conference
- 3 Case Examples of Successful Researcher-Industry Collaborations
- Quick Poll

CASE EXAMPLE 1

Researcher-Industry Collaboration: Realizing Evidence-Based and Sustainable Products

Lynn Gitlow, Ph.D., OTR/L, ATP
Adam Kinney, B.A., MSOTS
Ithaca College

Dianne Goodwin, MEBME
BlueSky Designs, Inc.

Assistive Technology Industries Association 2016

BlueSky Designs

- Focus: Product development for People with Disabilities
- Small Business Innovation Research grants
  - Accessible tent
  - Watercraft transfer mechanism
  - Independently accessible mounting
  - Power mount
- University collaborations

University collaborations

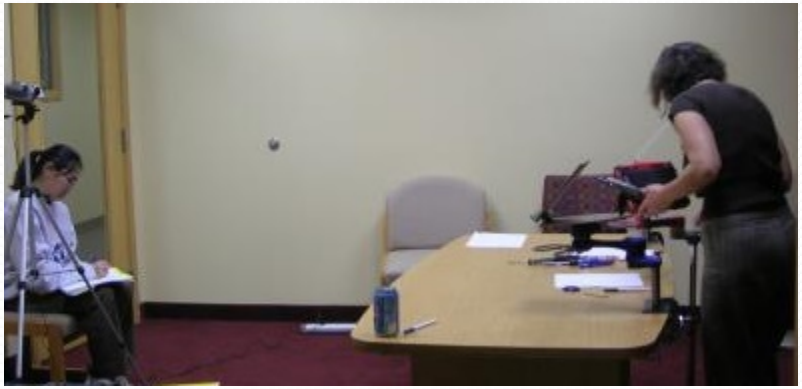
- Accessible tent
  - SUNY-Buffalo assisted in Market Research

- Watercraft transfer mechanism
  - U of Minnesota
  - Mechanical Engineering
  - Capstone project

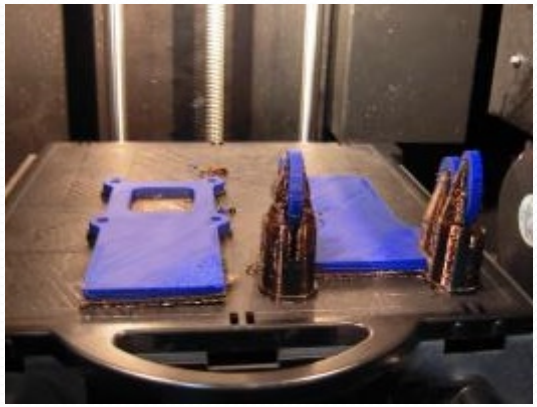
University collaborations

Interns

- Accessible mounting
  - U of Minnesota
  - Human factors grad student
  - Usability testing

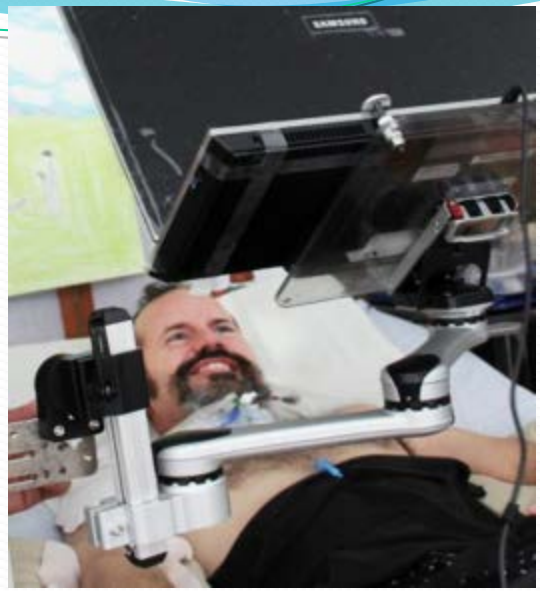


- UW-Stout
  - Industrial Design student
  - Accessory development



The Mount'n Mover

- A mounting system that moves
- Customize to lock in specific positions
- Attach to a variety of devices
- Controls allow some to move devices independently
- One-handed operation



Goals: Increased independence, functionality, utility and choice

- Independent repositioning where possible
- Easier repositioning by others
- Enhanced independence and functionality in
  - transfers
  - eating
  - toileting
  - device use
  - driving
- Repeatable positioning: customizable lock positions
- Multiple operating positions
- Multiple devices

Anecdotal outcome/case study: Kevin

- Able to independently reposition it
- Much improved access
- Greatly enhanced communication
- Photos and videos of daughter's gymnastics
- Crowd-sourced for funding
- "I began comparing the idea of being without it to being in a manual wheelchair instead of my power chair"

Impact on individual and family

- I have now had my own Mount'n Mover for a few weeks and have found myself ***naturally doing things I couldn't before***.
- We attended a small wedding, and I was ***able to take several pictures of the ceremony and then email them to the couple*** immediately afterwards.
- I can change nearly every aspect of the position of the iPad **myself**, no needing to ask for help, no trying to explain to someone how I want it repositioned, ***no waiting for someone to help***.
- The security of having my iPad easily accessible for communication has ***significantly increased my confidence and boldness*** when I am around other people; this ***makes my speech much clearer***
- His wife said: He is able to ***go out into public alone and I don't worry*** about him communicating with others. He's now able to take our daughter on ***daddy daughter dates*** which both of them love.

Outcomes matter!

- Mount'n Mover was a product
  - We knew it was making a difference
  - But our words were not enough
- Reached out to OT programs
  - Want to offer therapists justification for their recommendations
  - Unbiased research and substantiation
  - Better funding
- Question: What difference does the Mount'n Mover make?
- Two volunteers:
  - Lynn Gitlow, Ithica College
  - Denis Anson, Misercordia University

AT Outcomes Research: Impact of device (mount) use

- Psychosocial and functional outcomes
  - What are the outcomes/impact of using our mount?
- Ithaca College—BlueSky Designs collaboration
- Importance of AT outcomes/usability research
  - Funding justification
  - Rationale
- Methodology (PIADS, COPM)
  - Survey and interviews with existing MM users
- Results
- Discussion and Implications for future research

Research: Ithaca College

- Ithaca College, OT Department
- Researchers:
  - Lynn Gitlow, Ph.D., OTR/L, ATP
  - Adam Kinney, B.A., MSOTS
- Measuring the Outcomes

Why Measuring AT Outcomes is Important

- Professionals should recommend effective technology (Silver-Pacuilla, Brown, Overton, & Stewart, 2011)
- To ensure resources are well spent, the impact of the devices must be documented (Silver-Pacuilla et al., 2011)
- Supports rationale and justification for specific devices
- Stakeholders all benefit from knowledge of assistive device outcomes, including consumers, service providers, third-party payers, manufacturers and policy makers (Fuhrer, Jutai, Scherer, & Deruyter, 2003)

Methodology

- Retrospective case study design using quantitative assessments of existing users
- Psychosocial Impact of Assistive Devices Scale (PIADS)
  - online, using Qualtrics
- Optional follow-up: structured interview using the Canadian Occupational Performance Measure (COPM)
  - Administered in a variety of ways: Skype, telephone, and instant message
- Study approved by Ithaca College Human Subjects Review Committee

Quantitative research: About the PIADS

Psychosocial Impact of Assistive Devices Scale (PIADS)

- Measures changes in **functional independence** and **psychosocial impact** of the intervention
- 26-item self-report questionnaire designed to assess the effects of an assistive device on **functional independence**, **well-being**, and **quality of life** (Jutai & Day, 2002)
- Measures factors intrinsic to the individual as well as environmental factors which impact the psychosocial functioning of the person using the device (Jutai & Day, 2002)

About the COPM
Canadian Occupational Performance Measure

- Used to investigate the users' **performance and satisfaction with their performance** in meaningful activities before and after use of the mounting device

- Individualized standardized instrument that has been used in a number of research studies investigating outcomes of AT (Carswell, McColl, Baptiste, Law, Polatajko, & Pollock, 2004)

Sample

- A convenience sample of Mount'n Mover users
  - recruited by email
- 10 total respondents
- 4 consented to participate in the structured interview

General Results

- 80% were extremely satisfied with the device and felt that the device was extremely important to their lives
- Used for a wide variety of devices including communication devices (n=6), phones (n=2), laptops (n=2), eating trays (n=2), tablets (n=2) and cameras (n=1)
- Eight respondents agreed or strongly agreed that they received adequate training and support in use of the device; two strongly disagreed with this statement

Note: the level of direct training and support varies based on the vendor through which an end user receives the device

PIADS Subscale Results: Scale of -3 to +3

-3 = Greatly decreases and +3 = Greatly increases

Subscale	N	Mean	SD
Competence	9	2.121	1.049
Adaptability	9	2.147	1.046
Self-Esteem	9	2.001	1.160
*One user omitted due to missing values in items needed to calculate subscale.			

- The table above reports the means and standard deviations for the PIADS subscales which include: competence, adaptability and self-esteem.
- For nine of the ten respondents: their competence, adaptability and self-esteem increased as a result of using the Mount‘n Mover
- Subscale scores are calculated from several responses from the 26 items in the assessment

PIADS Negative Emotion Item Results

Item	N	Mean	SD
Frustration	10	-1.40	1.350
Embarrassment*	9	-1.33	1.414
Confusion	10	-.90	2.079
*One user did not enter response for item			

- The table above reports the results of the negative emotion item of the PIADs including means and standard deviations for frustration, embarrassment and confusion.
- The results indicate that on average, the users' frustration, embarrassment, and confusion decreased as a result of using the device

COPM Measurements

- **Importance**: 1 = not important to me to be able to do this through 10 = very important for me to be able to do this
- **Performance**: 1 = I am not able to do this through

  10 = I am able to do this well
- Satisfaction: 1 = am not satisfied at all with the way I perform this through

  10 = I am very satisfied with the way I perform this
- (Carswell et al., 2004)

COPM Results

- All four respondents had clinically significant improvement (an increase or decrease of 2) in their performance and satisfaction with performance of meaningful tasks that were impacted by the device
- The devices that were used with the Mount'n Mover and the characteristics of the Mount'n Mover ***enabled users to participate*** in a variety of meaningful activities including toileting, eating, engaging in volunteer and work-related pursuits, and leisure and social pursuits.

Participant 1

Occupation	Importance	Performance Before	Performance After	Satisfaction Before	Satisfaction After
Transferring	10	3	7	0	10
Using a Ham Radio	7	0	10	0	10
Photography	10	5	10	6	10
Write blog	10	3	10	3	10

- The table above reports the importance of various occupations to participant 1 along with the changes in performance and satisfaction scores before and after obtaining the Mount n Mover
- Change in Performance Score: 6.5
- Change in Satisfaction Score: 7.75

Participant 2

Occupation	Importance	Performance Before	Performance After	Satisfaction Before	Satisfaction After
Transferring	10	6	9	6	10
Answering Technical Calls for AAC Company	10	5	8	7	9
Socializing	10	7	9	8	10

- The table above reports the importance of various occupations to participant 2 along with the changes in performance and satisfaction scores before and after obtaining the Mount n Mover
- Change in Performance Score: 2.67
- Change in Satisfaction Score: 2.67

Participant 3

Occupation	Importance	Performance Before	Performance After	Satisfaction Before	Satisfaction After
Feeding	10	3.5	10	4	10
Community Service	10	4	10	5	10
Photography	10	0	10	1	10
Using Laptop or Tablet	10	0	10	1	10
Going Out to Eat	10	4	10	4	10
Texting	10	4	10	4	10

- The table above reports the importance of various occupations to participant 3 along with the changes in performance and satisfaction scores before and after obtaining the Mount n Mover
- Change in Performance Score: 7.42
- Change in Satisfaction Score: 6.83

Participant 4

Occupation	Importance	Performance Before	Performance After	Satisfaction Before	Satisfaction After
Adaptive Baseball	10	1	10	1	10
Socializing With Friends	10	5	10	5	10
Shopping	10	6	10	6	10
Volunteering	10	5	10	5	10
Using an iPad	10	1	10	1	10

- The table above reports the importance of various occupations to participant 4 along with the changes in performance and satisfaction scores before and after obtaining the Mount n Mover
- Change in Performance Score: 6.4
- Change in Satisfaction Score: 6.4

Limitations

- Respondents recruited from a convenience sample
- 90% of respondents continue to use the device
  - may indicate that primarily those who were satisfied with the device responded to the study
- Respondents asked to remember performance and satisfaction with performance before they got device
  - therefore data may not be completely accurate

Discussion

- Mount'n Mover use has positive functional and psychosocial impacts on this sampling of clients
- Users reported increased effectiveness, efficiency, satisfaction, and increased abilities to participate in meaningful activities when using the device
- The versatility and ease of use of the device, reported by most users as being important in making devices more useable by them

Future work:

- Additional research following a quasi-experimental design is underway investigating the impact of the device on new users

Misercordia research: Scope of Life

- Results of Denis Anson's research
- Had developed and was testing a new AT Outcomes evaluation tool
- Similar findings to Ithica's research
- Didn't show significant increases in the person's ability to access the device
- But it expanded a person's abilities to do other things
- It greatly impacted and increased their "Scope of Life"
- What can they do now, that they couldn't do before?
- How does a mount impact their ability to do other things?

Result of collaboration: Everyone Benefits!

- Adam Kinney completed his Masters
- Lynn Gitlow and Adam have more published research
- Upcoming joint article in AT Outcomes and Benefits Journal
- BlueSky Designs can reference results

- Therapists can reference results and substantiate their recommendations for the Mount'n Mover
- Consumers may be more likely to get a mount that furthers their independence

References

- Assistive Technology Act of 2004, Pub. L. 108-364.118 Stat. 1707 (2004). Retrieved March 3, 2013 from GPO Access database http://www.gpo.gov/fdsys/pkg/PLAW-108publ364/pdf/PLAW-108publ364.pdf.
- Fuhrer, M.J., Jutai, J.W., Scherer, M.J., & Deruyter, F. A framework for the conceptual modeling of assistive technology outcomes. Disability and Rehabilitation 2003; 25 (22), 1243-1251.
- Silver- Pacuilla, H., Brown, S., Overton, C., & Stewart, A. (2011). Assistive Technology Research Matters. Washington, DC: American Institutes for Research. Retrieved online July 24, 2013 at http://www.nationaltechcenter.org/documents/assistiveTechPrimer.pdf
- Arthanat, S., Bauer, S.M., Lenker, J., Nochajski, S., & Wu, Y.. Conceptualization and measurement of assistive technology usability. Disability and Rehabilitation: Assistive Technology 2007; 2(4): 235 – 248.
- Gelderblom, G. J. & de Witte, L.P. The assessment of assistive technology outcomes, effects and costs. Technology and Disability 2002; 14*:* 91–94
- Jutai, J., and Day, H. Psychosocial Impact of Assistive Devices Scale (PIADS). Technology and Disability 2002; 14*:* 91–9.
- Carswell, A., McColl, M.A., Baptiste, S., Law, M., Polatajko, H., & Pollock, N. The Canadian occupational performance measure: a research and clinical literature review. Canadian Journal of Occupational Therapy 2004; 71: 210-222.

Questions?

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CASE EXAMPLE 2

Researcher-Industry Collaboration: Establishing and Maintaining Trusted Partnerships!

James A. Leahy
KT4TT Center, University at Buffalo
http://sphhp.buffalo.edu/cat/kt4tt.html

Kathleen Hanek
SP Ableware, a Division of SP
http://www.maddak.com/index.php

3:30 – 5:00 p.m.

August 23, 2016

ATIA Member Partnership Webinar

Knowledge Translation K T 4 T T Technology Transfer

University at Buffalo

NIDILRR National Institute on Disability, Independent Living, and Rehabilitation Research

Key Learning Objective

- Discuss and Outline Steps for a Successful Corporate/University Collaboration.
- Describe and Discuss a Case Example of Successful Researcher Industry Partnership – Morph Wheels http://morphwheels.com
    - Foldable 24” manual wheelchair wheel whose dimensions when folded are 32” x 12.5”.

Background

- Longstanding Maddak/KT4TT (T^2RERC) Collaboration
  - Co-sponsored Invention Competitions at AOTA
  - Licensed ADL products to Maddak ranging from toilet seats to drinking cups

Initiating a Collaboration

- How do you institute a collaboration with a company? In some cases it's through a referral, but in many cases, it's a cold call. Other presentations have covered the topic of ***Knowing What to Say***, ***How to Say It, and When to Say It*** when speaking with a company. Bottom line here – want to be perceived as a resource by the company. ***NEVER***, ***EVER*** say anything negative about the company or its products!!!!
- First step – Before the Call – Need to Become Knowledgeable of the Industry you are Approaching.
  - Know the Industry, the players, the product development cycles
    - Who are the companies? What are the trade shows? How do they introduce new products?
  - What are the mark-ups for products in this industry? 3:1, 4:1, 6:1 or higher (software)
  - Do they routinely license products?
  - Will they accept your NDA?
  - Will they only accept patented products?

Criteria for Vetting Potential Corporate Collaborators

Before you enter into an agreement with a Corporate partner, you need to do a little additional homework!

Criteria 1

- Has the potential Corporate Collaborator previously entered into external partnerships or funded R&D work by an outside entity?
  - If no, you are breaking new ground with the company and the internal corporate framework is not in place for a successful collaboration.
  - If yes, was the outcome successful? Were both parties pleased with the outcome?

Criteria for Vetting Potential Corporate Collaborators (cont.)

Criteria 2

- Is the potential corporate collaborator open to receiving and evaluating technology or inventions from outside the corporation?
  - If yes, what are their policies?
  - Total ownership of anything submitted?
- Will they sign your NDA agreement? Do they have one of their own?
  - If no, you may have difficulties working with the internal Corporate group – Not invented here syndrome.

Criteria for Vetting Potential Corporate Collaborators (cont.)

Criteria 3

- From the corporate standpoint, will you be working with a team or just 1 individual?
  - If 1 individual, you risk not knowing the corporate culture (only 1 person perspective); you risk that person leaving or being laid off; you risk timely communication failures;
  - If a team, you have multiple contacts (in case 1 leaves– project will continue), you have multiple perspectives – everything from marketing to engineering to new product introduction.

Criteria for Vetting Potential Corporate Collaborators (cont.)

Criteria 4

- Does the corporation have a firm timetable and objective in mind? What percentages of key personnel time do they see allocating to this project?
  - If no, internal personnel or other resource allocation to the project may be lacking.
  - If yes, you know your corporate partner is committing to making the project a success.

Initiating a Collaboration- Phase 2

- **How to Succeed in Discussions with a Corporate Partner:**
  Communication – partnering/brokering role is of tantamount importance.
  - ***Follow Up***. Ask for a specific date and time for the next conversation.
  - ***Follow Up***. Make the call at that date and time. If progress is made, that's great. Either way – ask for a specific date and time for the next conversation.
  - ***Follow Up***. This is a contact sport. If you are asked for anything, deliver it on time. Work on Corporate Schedule, not an Academic Schedule.

Understanding a Manufacturer's Mindset What Affects the Decision?

- **Product Line Focus:**
  - Manufacturers may have many product lines, family/product categories
  - Typically they will have dedicated focus– inquire about what that focus is
    - A rejection to a product does not mean it is not a good product
    - Rejection is not personal, it is ALWAYS a business decision
- **Build a Relationship**
  - Understand the manufacturer's focus
  - Gear submissions towards focus
  - If possible work with manufacturer during the design process to make the transition to manufacturing easier

Understanding a Manufacturer's Mindset What Affects the Decision? (cont.)

- **Go to Market and Start Up Costs:**
  - Familiarize yourself with the terminology ROI (Return on Investment)
    - Corporate decisions are based on the projects projected ROI
      - What can affect ROI?
        - Market Size
        - Product Cost vs. Market Price
          - Distribution methods: Direct to Consumer; Business to Business
        - Prototyping and Tooling investments can be significant
          - Investment costs vary depending on manufacturing method, number of parts etc.
        - R&D budgets and personal resources often require both small and large projects
          - Does your project fit in the resource allocation for the year?

Understanding a Manufacturer's Mindset What Affects the Decision? (cont.)

Product Profitability Analysis

Assumptions

Product Cost	$50.00	
MSRP	$200.00	This represents a 4X Mark UP
Distributor Cost	$100.00	Typical 50% discount to distributor
Tax Rate	40%	Standard Rate
Royalty %	5.0%	This can vary on a case by case basis

Financial Analysis

Total Volume (Units)	900	
Total Gross Revenue ($)	$90,000.00	Units x Distributor Cost
Total Cost	$45,000.00	Units x Product Cost
Total Gross Margin	$45,000.00	Total Gross Revenue - Total Cost
Total Tax Amount	$18,000.00	Gross Margin x Tax Rate
Total Margin Post Tax	$27,000.00	Total Gross Margin - Tax Amount
Royalty	$4,500.00	Gross Revenue x Royalty%
NET PROFIT	**$22,500.00**	Post Tax Margin - Royalty
Total Gross Margin % Post Tax	**25.0%**	Net Profit/Total Gross Revenue

Understanding a Manufacturer's Mindset What Affects the Decision? (cont.)

- **Product Design Flexibility**
  - Can the design be updated to reach a broader market
  - Can the design be updated to reduce costs
  - Is the researcher/inventor flexible
    - Is there an emotional attachment to the product
- **Researcher/Inventor Expectations:**
  - Patent ownership
    - This is dictated by law not the company
  - Licensing/Royalty (ROI)
  - Product line extensions

Understanding a Manufacturer's Mindset What Affects the Decision? (cont.)

- **Project Justification (There's that ROI again)**
  - Project justification can be time consuming (very!)
  - Decision making can be easier if you have research data to back up product claims, target population market size, estimated costs etc.
    - Be realistic
    - Be as thorough as possible
    - You will gain points for pertinent/useful information!
      - Balance this with excluding "non-decision" making information
  - Justification is on-going throughout a projects
    - Things can change
    - Stage gate decisions can affect the outcome of the project

Understanding a Manufacturer's Mindset What Affects the Decision? (cont.)

- **Qualities of the successful partnership**
  - Cooperation:
    - Cooperation is important because the process is most successful when it is collaborative.
  - Flexibility
    - Flexibility is necessary since inventions often have to be tweaked or modified in order to increase their change of success.
  - Patience
    - Patience is critical because doing a good job can take time.
  - Respect
    - Each party brings a skill set to the table.
    - Playing off of each other's strength increases the chances for success.

Case Example: Morph Wheels

- Foldable Wheel Concept previously reviewed by KT4TT via Invention Submission/Technical Assistance request from a University professor.
- In correspondence with inventor and his University TTO, KT4TT brought to their attention a patent out of England on the same concept that they would probably be infringing upon.
- University TTO agreed and the project was dropped.
- Few years later, Maddak became interested in the foldable wheel concept and licensed the patent.

Case Example: Morph Wheels (cont.)

- After Licensing the patent on the foldable wheel concept, Kathleen Hanek of Maddak contacted the KT4TT to discuss what assistance KT4TT could provide in product development.
- Project fit within KT4TT's Participant/Observer Product Development project.
- KT4TT recruited the NIDILRR funded RERC on Wheeled Mobility (WM) at Georgia Tech to assist with meeting wheelchair wheel testing and standard guidelines.
- KT4TT, Maddak and RERC on WM possessed a shared vision for designing innovative concepts to provide solutions to the everyday problems faced by manual w/c users.

Case Example: Morph Wheels (cont.)

- Communication among partners of paramount importance. Worked on Corporate schedule, not Academic schedule.
- Constant email and telephone conference calls to keep all informed on progress, challenges, etc.
- First and foremost – consumer involvement in all stages of new product development is critical. KT4TT scheduled Concept Definition (Alpha) focus groups on the topic area. Maddak attended the focus groups and demonstrated a first generation prototype to focus group participants.

Case Example: Morph Wheels (cont.)

- Maddak engineers and product designers took the needed product functions and features identified in the Alpha Focus groups and incorporated them into their design.
- Upon completion of the Alpha prototype, Beta Focus groups were scheduled and held for product refinement.
- Modifications groups to the pre-production prototype were made by Maddak engineers based on the consumer feedback from the Beta.
- Beneficial Design was enlisted to conduct the final product testing of the Morph Wheels prior to product introduction.

Morph Wheels (cont.)
Commercialization Process

- Initiated an aggressive PR and Marketing Campaign
  - Enlisted PR Firm
  - Brand Ambassadors
  - Advertised in key publications
  - Attended key shows and conferences
- Innovative collateral material
- Targeted key business customers
- Grass roots approach to end users
- Email blasts and social media

Morph Wheels (cont.) Commercialization Process Highlights and Recognition

- Popular Science Best of What's New
- Medtrade Spring New Product Pavilion Innovation Award
- London Design Museum's Product of the Year– Transportation Category
- Television Appearances
  - CNN Blueprint; Fox and Friends; My Fox – Boston; New England News Channel; KTLA; Telemundo; The Daily Buzz; Fox 4 – Kansas City.
- Newspaper and Magazine Articles
  - USA Today (2 times); Atlantic Magazine; Wall Street Journal; Quest Magazine; PN Magazine; Sports-n-Spokes.
- Radio and Internet
  - Gizmodo; MomRN; Disabled Life Media.

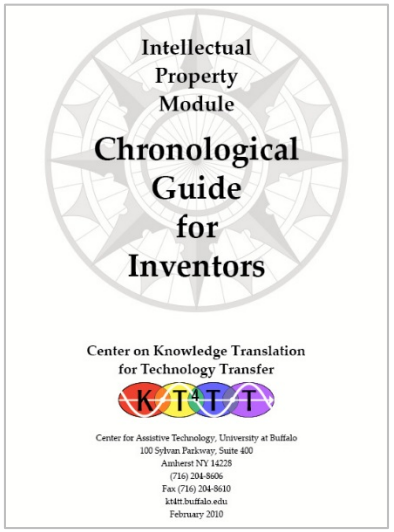
Summary – Lessons Learned

- Corporations are on tight product development schedules and do not have the flexibility to spend months negotiating agreements.
- If you are University based, having discussion with your University's TTO prior to any collaboration is extremely important. The University must have a defined Corporate Collaboration Model in place with template the legal agreements at the ready. Heavy internal bureaucratic lifting must be done prior to contact with a company.
- Academics must operate in a business mode and timeframe in all aspects of the project from initial agreements to completion of the project with delivery of a product to the marketplace.
- Mission of University is to benefit society. Mission of the corporation is to benefit shareholders.

Summary

- Visit the KT4TT web site for additional information, more examples and a chronological step by step guide for inventors. http://sphhp.buffalo.edu/cat/kt4tt.html

Thank you!



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CASE EXAMPLE 3

Researcher-Industry Collaboration: Realizing Evidence-Based and Sustainable Products!

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KT4TT Center University at Buffalo
http://sphhp.buffalo.edu/cat/kt4tt.html

David Arnott
Comforts of Home Companion Services/Black and Decker
http://www.comforts-of-home.net/

3:30 – 5:00 p.m.

August 23, 2016

ATIA Member

Partnership Webinar

Knowledge Translation KT4TT Technology Transfer

CAT

University at Buffalo

NIDILRR National Institute on Disability, Independent Living, and Rehabilitation Research

Key Learning Objective

- Describe 3 Key Benefits of Effective University-Industry Partnerships
- Case Example: Lids Off Jar Opener
  - Electrically powered automated jar opener; sold over 1 million units in its first year.

Background

- Longstanding Black and Decker / KT4TT (T^2RERC) Collaboration

Background (cont.)

- Corporations are seeking R&D partnerships with Universities.
- Tough economy has forced corporations to seek less expensive avenues for R&D.
- Corporations are seeking University partners with unique research capabilities or facilities.
- Historically there are differences between University research goals and Corporation research goals .

Background (cont.)

- At Universities – research outcome is important to researcher and institution.
- Research findings lead to publications which in turn lead to tenure and prestige for the researcher and the University.
- Research findings lead to new technology breakthroughs and patents and licenses which bring revenues to the University.
- However, Corporations look at how research will impact their financial bottom line.

Background (cont.)

- Research must either lead to the development of new profitable products or impact production processes thus providing a competitive advantage for the corporation.
- University based researchers have little knowledge and understanding of the market demands in a corporations industry niche.
- University based researchers lack the expertise needed to create products that work in the marketplace
- Conversely most Corporations have little insight into the existing academic bureaucracy at many universities.
- University/Corporate collaborations have always faced obstacles to joint product development projects.

KT4TT / T²RERC Perspective

- **Key Topics Must Be Considered/Addressed*Before* Approaching a Corporation for an R&D collaboration.**
- Corporations Don't have Months on End Available to Negotiate Agreements – Template agreements ***Must*** be drafted.
  - Confidentiality Agreement Decision and Discussion.
    - Affects Researcher Publication Dates;
    - Ability to Take Research Elsewhere if Need Be;
    - What is the Scope of the Confidentiality Agreement?
  - Intellectual Property Agreement Must be in place for resultant IP generated by collaboration. ***Who Owns What and for How Long?***
    - Licensing Terms, if appropriate, must be outlined (including exclusivity, royalties, duration of agreement, use of University's and researcher's name, etc.) Without an agreement in place conflicts will arise regarding ownership of the results.

KT4TT / T2RERC Perspective (cont.)

- **Key Topics Must Be Considered/Addressed*Before* Approaching a Corporation for an R&D collaboration.**
  - Finite Timeline for Project Duration
    - Defined Product Introduction Date;
    - Corporations typically have short product introductions cycles
    - Academic researchers typically operate in semesters or years and have not had time sensitive research deadlines.
    - Both partners have to know and understand each other's scheduling constraints.
  - Defined Scope of Work for All Parties Involved
  - Personnel, Financial, and Facility Resource Commitments for both Corporate and University Entities Need to be Outlined
    - Example – what university lab or research facilities will be used and during what time frame?

Black and Decker Perspective

Lids Off Jar Opener

- In 1999 Jen Davis, of Yale University, was a winning team leader at the BF Goodrich Collegiate Inventors Competition for her Twistmaster, automated jar opening device.
- T^{2}RERC (KT4TT) knew of the unmet need among older adults for such a device through work done by the RERC on Aging.
- T^{2}RERC contacted Ms. Davis and were informed that B&D owned the IP rights. In 1998 B&D had approached Yale after receiving suggestions for student projects to fund from a corporate suggestion box.
- T^{2}RERC then cold called Black and Decker to ascertain their plans for the Twistmaster.

Lids Off Jar Opener (cont.)

- B&D stated they were not satisfied with the current device design and possessed a hesitant attitude towards the product as they believed the market for the product was unclear and undefined.
- In March 2000, the T^2RERC went about defining the need and delineating the market for an Automated Jar Opener through primary and secondary marketing.
- Marketing Data and price point information was presented to B&D who by October 2000 agreed to take on the project.
- Early in 2001, Alpha or Concept definition focus groups were run detailing 29 specific needed functions and features of an Automated jar opener along with specific consumer purchase intent and price point information. This information was presented to B&D product designers and their project team.

Lids Off Jar Opener (cont.)

- A functional prototype was fabricated by B&D along with 3 foam models all with different handle and activation button designs.
- Two Beta focus groups were held in late 2001 where participants performed a ranking by importance of the previously identified function and design features of the jar opener concept.
- Beta focus group participants chose the final overall jar opener shape, activation button location, size, and shape, type of handle and the bottom jaws unlock activator for the device.

Lids Off Jar Opener (cont.)

- Beta focus group participants also identified a selling price of $40 and that it would be well received as a gift item at Holiday time.
- Product was introduced and initially sold via the internet and then onto mainstream distribution channels (Wal-Mart, Target, etc.)
- T^{2}RERC assisted B&D Public Relations with everything from press releases, to contacting the USA Today for an article on the Jar Opener.

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Technology's helping hand

'Universal design' makes everyday objects easier to use, for everyone

By Jo-Sung Yoo
USA TODAY

Pound for pound, is there anything more fiendishly frustrating than trying to open the impenetrable pickle jar?

Universally comical to the point of being Seinfeld fodder — as a stubborn jar triggers a grunting, spastic "full-body flex" — this simplest of acts can be ego-crushingly difficult, even for the most able-bodied. For the elderly or disabled, it can be close to impossible.

A product co-developed by the Rehabilitation Engineering Research Center on Technology Transfer (T²RERC) at the State University of New York at Buffalo aims to end the problem. The Black & Decker Lids Off jar opener, resembling a coffee maker sans pot, opens jars with the push of a button.

Now on the market, the $50 jar opener is one of a growing number of consumer products to embrace universal design, a set of mantras espousing the idea that places and products should be accessible, ergonomic and intuitive. Though diverse in form and function, these designs are typified by uncluttered layouts with comfortable, intuitive controls requiring minimal effort to operate.

The seven principles of universal design were laid out at North Carolina State's Center for Universal Design in 1997, a year before it became a Rehabilitation Engineering Research Center. But the term was coined in the early '80s by architect Ron Mace, and advocates trace its roots as far back as the '70s, when the nascent civil rights movement spurred action within the disabled community.

The research centers — now totaling 22, with five focusing on universal design — began in 1998, funded by the National Institute on Disability and Rehabilitation Research, which helped implement 1990's Americans With Disabilities Act, which made it illegal to discriminate against the disabled.

Design comes of age

For some designers, universal design is an ideal that maximizes the utility and marketability of just about any given product. To others, it is an innate part of any well-thought-out design, only now given a label.

The rise of universal design comes in response to the greying of the baby boomers, the 77 million Americans born between 1946 and 1964 who represent 27.5% of the population. As they near retirement they, along with the one in five Americans suffering some level of disability, will require technologies that fit their needs.

The focus of accommodating design in the '60s and '70s was on architecture, responding to laws prohibiting physical barriers for the disabled. It continues to make headway in that regard but has since extended to everything from cars to consumer products, even packaging:

- The OXO Good Grips kitchen tools, with their plush handles, were developed for arthritis sufferers but have other applications and may be the benchmark for universal design.
- Damacell uses universal design to package hearing-aid batteries, which come attached to break-off tabs.
- Ford Motor Co. strapped its designers into the so-called "Third Age Suit" to simulate the physical restrictions of advanced age. Their mostly 30- to 40-year-old designers adjusted everything from seat height to knob size and placement in a number of cars, starting with the 1999 Focus.

Where differing applications meet

At its simplest, universal design in products is where consumer goods meet assistive technology, devices intended for use by the disabled. But it does not distinguish between populations. Says designer James Mueller, co-author of the seven principles: "It's the way we should be designing everything."

When selecting features for any given product, "you can get 80% of the features for a reasonable cost," says James Leahy, project administrator at T²RERC. "You start trying to get that extra 20% ... it's hard to make it totally accessible to everyone, the cost on the unit goes up tremendously."

In the past, companies figured, "we'll pay focus as much money, and we'll only reach another 2% to 3% of the population," says Joe Lane, project director of T²RERC. But as more people get pushed to the end of the bell curve, that percentage is quickly growing and brings with it an estimated $2.1 trillion in annual spending power.

In short, the minority isn't so minor anymore. And baby boomers have high expectations.

"By and large, they have watched technology accomplish things that their parents never expected it to do," Mueller says. "As they get older and their function changes, they expect products to simply respond."

The trick is to accommodate but not alienate.

"The last thing we want to do is design an 'old-person's car,'" says Fred Lupton, ergonomics supervisor at Ford.

Some designers support universal design's intent, but they warn against overzealous application.

"I think it's good for awareness, but if not examined carefully, it can be overly simplistic," says Steven Montgomery, who teaches advanced product design at the Art Center College of Design in Pasadena, Calif. "Not one solution has to fit everybody. ... You can afford customization with the way things are manufactured now."

Even advocates acknowledge that truly universal designs may be as impossible, if worthy, ideal.

"It's dangerous to say there's a design that works for everybody," Mueller says. "Even though it means 'design for everybody,' it doesn't mean 'one design for everybody.'"

Lids Off Jar Opener
Purpose: Black and Decker Lids Off jar opener saves you the trouble of fumbling with those impossible-to-open containers.

Principles of universal design

1. **Equitable use.** The design is useful and marketable to people with diverse abilities.
2. **Flexibility in use.** The design accommodates a wide range of individual preferences and abilities.
3. **Simple and intuitive use.** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level.
4. **Perceptible information.** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. **Tolerance for error.** The design minimizes hazards and the adverse consequences of accidental or unintended actions.
6. **Low physical effort.** The design can be used efficiently and comfortably and with a minimum of fatigue.
7. **Size and space for approach and use.** Appropriate size and space is provided for approach, reach, manipulation and use, regardless of user's body size, posture or mobility.

Source: The Center for Universal Design

Lids Off Jar Opener (cont.)

- Lids Off Jar Opener work led to additional projects in future years on a Toaster/Convection Oven and the Gizmo can opener.
- Communication among partners of paramount importance. Worked on Corporate schedule, not Academic schedule.
- Constant email and telephone conference calls to keep all informed on progress, challenges, etc.
- First and foremost – consumer involvement in all stages of new product development is critical.

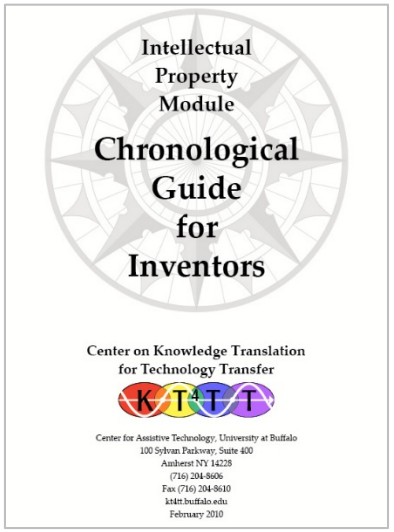
Summary

- Benefits of Effective University/Industry Partnerships
  - First, and foremost – delivering products needed by consumers in the marketplace. University Applied Research is focused on solving problems
  - Training of University students in not just Academic endeavors but in corporate business. In effect developing a highly skilled workforce for a globally competitive economy.
  - Corporations ability to leverage and use unique University research capabilities or facilities. Corporations are seeking much less expensive avenues for research and development.

Summary (cont.)

- Visit the KT4TT web site for additional information, more examples and a chronological step by step guide for inventors. http://sphhp.buffalo.edu/cat/kt4tt.html

Thank you!



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Questions & Discussion

Thank you!

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