**2017 Online KT Conference:**

**Knowledge Translation Outcome Measurement**

Knowledge Translation for Technology Transfer: Tips and Tools for Communicating with Key Stakeholders

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Originally Recorded on October 30, 2017

YouTube Link: https://youtu.be/3VAYEoKGGG8

JOANN STARKS: Okay. Everyone, welcome back. Our next session this afternoon is from Jennifer Flagg who is co-principal investigator at the Center on Knowledge Translation for Technology Transfer, KT4TT, at the University at Buffalo, she will address KT for Technology Transfer: Tips and Tools for Communicating with Key Stakeholders, Jennifer are you ready to begin?

JENNIFER FLAGG: I am. Thank you, and thank you to KT and AIR to share this information on KT and tech transfer, TT, with the audience today. So, first, just a quick outline of what we'll be talking today. After a short introduction, I'll talk about key stakeholders who are involved in development and transfer. This provides the context for the remainder of the discussion by answering the question, with whom are we trying to communicate next we'll talk about two overarching frameworks that can be used to structure our development and transfer project and how those frameworks relate to communicating with key stakeholders. We'll touch about barriers to development and transfer and discuss a few resources that can help you overcome those barriers. We'll talk about milestones and metrics for development on transfer projects and how those relate to the previous material. Finally I'll wrap it up with a brief summary of takeaways and we should have a little time for Q&A but I will also be on the discussion session following this presentation.

All right, so a little bit about me. I am a co-PI with the center on knowledge translation. I've been in tech transfer for assistive technology in medical devices for about 17 years. You can learn more on our website, www.KT4TT.Buffalo.edu. I'm also the editor in chief of the Journal assistive technology and benefits which is published by the – if you’re not familiar with the publication, I encourage you to check out that website at www.ATI.org/ADOD. There you with download our previous issues. Everything is free of charge. We're an open access publication so if you're looking to meet NIDILRR's open access -- I encourage you to submit to our magazine.

So, about the center. The center on KT4TT is entering its fifth year of a five-year funding cycle. Prior to that our team operated as the rehab engineering research center on technology transfer. We conduct numerous development projects commercializing around 50 devices during the center's lifetime. So now, as we moved over to the role of the KT4TT we focus more on developing models, metrics, methods and tools for development and transfer with a goal of sharing them with others to improve their development and transfer outcomes.

So you'll notice many of the presentations are geared toward research projects and I'm here toll bring in the technology component. This is particularly geared toward NIDILRR developers who are engaged in technology. But to all inventors, whether you're in University, a small business, or maybe even community-based. The point is if you're generating a technological innovation that you intend to be used for others, this material is for you. So what is the purpose of this talk? NIDILRR's mission is to generate new knowledge and promote to individuals with disabilities to perform with their choice in community and expand capacity to provide full opportunities and accommodations for citizens with disabilities. So, what does the term new knowledge mean? Well, in a paper published in the journal implementation science by the PI of my center, Joe Lane and I, we characterize knowledge as being in three states. Conceptual discoveries that are generated through the application of research methods. Next, it can mean prototype inventions generated through development methods and finally, innovations, generated through production methods.

So here we're talking about the transition of knowledge from the invention state to the innovation state, and in this case, tech transfer is the process that moves the invention from a lab or University out into the marketplace where it can actually be obtained and used by consumers.

We do have to keep in mind that tech transfer involves more than the exchange of intellectual properties and in fact there are best practices we can take to maximize the chances of introducing a successful product to the marketplace. So, when we think about who the key stakeholders are, we have to think of all those individuals or groups who are intermediaries between our work and the consumer who are with the invention or product we're developing. First and foremost, in the context of NIDILRR projects of course we have to look at NIDILRR staff as a key stakeholder. As a NIDILRR grantee you'll be sharing your product with your project officer and perhaps looking to their guidance and advice based on their extensive knowledge and experience. Next, I think we can all agree it's of utmost importance to effectively communicate with peer reviewers.

These are really the gatekeeper between your proposal and funding. Next, buyers, users throughout the development and transfer process.

So, of course, when we get to the end once we have a product in the market we'd be talking about communication related to selling a product using marketing strategies, but before that can occur, you want to communicate with this group throughout your development process to ensure that you're creating something of value and that they'll buy. Really, integrated KT. Next up, the tech transfer office. If you're in a University-based setting, you'll have to communicate with your tech transfer office at a few different points in time. The first, early communication can help to ensure that they're aware of your projects and your intended outputs and have a chance to consider how they'll contribute to the success of your project. Communication with the TTO comes back into play later on during development activities, perhaps when intellectual property questions come into play or when you're seeking a manufacturing or distribution partner.

And lastly, of course, to get to market we may need industry partners or we may need investors to help provide seed funding for our business. If you're planning to license your invention, you'd be looking for those industry partners and they'd want to see tailored communication from you in a format that resonates with their organization's needs and values. Similarly, if you were creating a spinoff company, you might be seeking investors. These could be family or friends or venture capitalists but in any case, they're going to be want to know how their financing will help transform your dreams into a reality that makes sense for them.

In each case, we might be communicating much of the same information but we often need to do so in different ways. Now we'll take a look at the overarching framework for structuring communications with each of these groups. As you may know, NIDILRR has recently created stages of development framework. They also have a stages of research framework, and this is the first one I'd like to discuss. So, in NIDILRR's words, the stages of development are first, proof of concept. Here, key technical challenges are resolved and the stage results establish that the product concept is feasible. In the proof of product stage, we've integrated, we have a fully integrated and working prototype that's meeting critical technical requirements. The stage results establish that the fully-integrated product is realizable. Last we have proof of adoption. This is where the product is substantially adopted by the target population and used for the intended purpose establishing that the product is beneficial.

So, why should you consider using the stages of development framework? Well, first, it gives us a useful framework for planning and implementing our development projects. Second, it would hip you to better communicate with NIDILRR staff and also with peer reviewers. By aligning all development projects under this common framework it just makes it easier to explain and understand where a particular development project stands and where it's intended to go during the funding cycle. So again, this gives product investigators, NIDILRR staff and peer reviewers a very clear picture of the expected product deliverables. Perhaps the most compelling argument is the simple fact that in some recent competitions NIDILRR has included a criteria which says that the applicant identifies and specifies the stage of development and activities at this stage. So this f this component was left out after it has been requested by NIDILRR, a peer reviewer may feel compelled to deduct points, something with don't want to see happen.

So you might be wondering which stages apply to your products and I've included a few links where you can check out these helpful resources produced by NIDILRR to help you answer that question.

So, the second overarching framework I'd like to share with you today is the Need to Knowledge model and it is variants. The Need to Knowledge model, otherwise known as its NtK is a step by step process model and it has a format which describes the research, development, and production processes for products that tend to generate commercial products, industry standards or clinical guidelines, laboratory instruments or fabrication tools and freeware applications or do it yourself instructions. So again, these are planning and implementation tools that can be used to ensure that all key product requirements are accounted for and that, of course, improves the chances of us getting to the point of introducing a successful product to the marketplace.

So, here, we have a little more detail about the NtK models in general. All of the variant models were constructed by piecing together best practices in development and transfer as defined by industry standards. So, for example, the commercial devices model is based on information contained in a series of handbooks and toolbooks produced by the internationally known authority in product development, the product development management association, PDMA. We use the information in those resources to start staging that introduce successful products and similar processes followed for the creation of each variant model inclusion the use of literature reviews, discussion with Subject Matter Experts an reviews by potential users.

Each of the model follows a stage gate design with step by step details and the stages and steps describe the critical activities needed to generate viable inventions and innovations while the gates offer opportunity to step back from the work, evaluating changing internal and external conditions and then use that information to make a logical decision to either proceed as planned, pivot, or halt the product entirely.

Each model contains icons and these use to tools, supporting evidence drawn from the literature reviews, and case examples of each stage and practice. All of the variants begin with the same front-end activities. We've found these are universally applicable to all products though they do diverge after stage three. Also include guidance on using knowledge transfer, so these can be found at the end of stages three, six, and seven where you may wish to share information about a discovery, invention, or innovation with other stakeholders. In the model you'll look for a link to KT Tables and these list six stakeholder groups who are often involved in development and transfer. They include researchers, consumers, clinicians or practitioners, manufacturers, brokers, which are often the TTOs, tech transfer offices, and policy makers.

These KT Tables describe what to share with each knowledge user group, how to reach that group, and the anticipated KT outcomes. We've also included a variation on Ian Graham's knowledge to action model which is how the outputs generated through the stages models and steps can be used in your KT effort. So, now that we've discussed an overview of the NtK's model I'd like to do a little deeper dive into the commercial devices variant NtK. So as you'll see here, the models begin with problem and solution definition. So we're talking to various stakeholders, determining the inventor's role in the product, how the solution would be moved from the inventor to the marketplace, and before we're proceeding to stage 2, we want to be mindful of gate 1 where we might ask, is the problem and solution set novel? Is it feasible to implement? Will the output be useful to the target audience? And is there a clear path from the project output to the beneficiary stakeholders? So assuming positive responses are given to these questions, then we move on to stage two, scoping.

This is where the homework or few diligence is performed to better understand the market. How many people might need or buy my product? And also to understand the business potential? So, account product be manufactured at a cost that the consumer will bear? Again, at the completion of this stage, the investigator would be wise to question continuation of the project by asking if the proposed solution and path to output and outcome seem feasible given the new information that we've gathered in this stage. If a decision to continue is made, the next question revolves around the need to generate new knowledge or to use existing knowledge to move straight to development activities.

So, if new knowledge is needed, stage 3 would involve planning and executing a research project, eventually using the results to either advance development work internally or to share the results with others to inform their work. If new knowledge is not needed, then the project could proceed directly to development activity. But, in any case, we can't discount the first two stages, which should always be completed prior to engaging in any ROD project that's intended to result in a technology-based output. So once stage 3 has been completed, the gate question would then ask if the discoveries reaffirm the potential for the envisioned solution, and if not, we might reiterate, we might reallocate our resources to more promise s projects, but if so, then we move on to the development stage.

Stage 4 marks the beginning of the development stage. Here, this is where many planning activities occur. We're engaging with key stakeholders, we're trying to establish mutually beneficial partnerships with them, we're creating our business case, often using information gathered during the stage 2 scoping activities. Engineering implementation plans would be developed Andrew source requirements evaluated while product specifications are being gathered from stakeholders. So, this is where alpha focus groups might be conducted where we're identifying needed functions and features of a device. Based on the results of this stage, an appropriate gate question would be to consider if all elements of the business case have been fully vetted and validate, and should we implement the development plan?

Stage 5 is where the alpha prototypes would be built, bench tested, and refined to generate a more polished beta prototype. A gate question for this stage would be, does the beta prototype solve the problem and will it be feasible to deploy in the marketplace? If so, then we're going to continue to beta prototype testing. Stage 6, here additional testing and refinement occurs. This usually begins with testing with users in controlled conditions followed by some refinements so the device and then testing in real world conditions. So either at home or maybe a community setting. At the completion of this stage, the inventor is often ready to finalize invention claims so that a patent could be filed if it's needed. After completing stage 6, the gate question would be two-fold. One, is the investigator's role in the project complete? Often, this is where a handoff to a transfer partner might occur and in that case, it would be appropriate to use the knowledge translation opportunity that I mentioned earlier to communicate the value of the invention output to the transfer partner.

If the investigator's role would continue, then the key question becomes, will this prototype invention satisfy consumer needs in a way that matches the proposed business and is therefore significant in production?

Assuming this question is again answered with a yes, the final phase is the production phase, which begins with stage 7, production planning. So, here, materials and manufacturing processes are identified and coordinated. Distribution logistics would be considered, and marketing and sales plans would be finalized. This stage may end with a test market or trial sell of a product which then allows the company to refine and ramp up their back end processes smoothly. At the end of this stage, the gate activity would review the deployment plans to determine if the financial probations and logistical plans support continuation. If all considerations from stage 7 look promising, then the product is ready for a full scale launch in stage 8. So here we're initiating our rollout plan, monitoring thing it's once the product is in the market, providing product support and offering troubleshooting. Stage 8 then has a gate offering an opportunity for reflection on product deployments to determine if production should continue.

Finally, stage 9, post-launch review involves the continuation of production, monitoring and support, and also offers an opportunity to review performance against initial expect aces so that might involve determining if sales are met, or if customers are using or abandoning a project. We can use sales and survey data. Going further, conducting efficacy studies that explore deeper measures of satisfaction and quality of life improvements which could be attributed to the product.

Lastly, gate 9 again uses performance data and marketing information to inform future decisions about the introduction of new versions, or if it's time so simply pull the product from the market.

So, how does the Need to Knowledge model and the stages of development align? Well, unfortunately, it's not a clean one to one match, but I do have a few suggestions on how we can consider what activities, so what NtK stages and steps, best align with the stages of development and their anticipated outputs. So, here's one way to match them up. The proof of concept stage is looking for an investigator to demonstrate that the product concept is feasible. So, all of the work that we just talked about in stages one through five from the early scoping through the generation of an alpha prototype could be aligned with this stage of development. Similarly, how do we know if a product is realizable? Well, in the context of the Need to Knowledge model, that could involve prototype development and testing which would then prove that the concept can be reduced to practice as well as production planning which would move beyond technical feasibility to demonstrate that the product could indeed be manufactured, hopefully at a cost that the market will bear.

Finally, how do we determine that a product is beneficial? This could involve obtaining consumer feedback and possibly, again, conducting a formal efficacy study like the one we just talked about in stage 9 of the NtK. So, again, these are just suggestions to get you thinking before the type of work that might be involved in assuring that your proposed development activities would be realistic and logical in the eyes of air grant proposal reviewer and of course of maximum benefit to the stakeholders we're trying to serve.

So, the key takeaways for this part of the talk are just, in thinking about these frameworks, we might consider that both, we can use them to structure and plan our development projects. We can use them for identifying appropriate milestones. So, again, for example, which NtK stages best align with the stage of development you're proposing? For establishing performance metrics. So, again, we could benchmark progress against the NtK steps asking, have we completed these steps in a timely manner? And also for communicating with key stakeholders, which, in this case, might be the project team, it peer reviewer, NIDILRR staff and industry partners or investors.

Now that we've talked a little about these high level frameworks, let's say you've won an award. Now you're looking at implementing your investment projects and then eventually successfully communicating those outputs to other stakeholders. So, here's where we get into some of the nitty gritty details of TT and specifically look at barriers to outreach. So, first, we have insufficient allocation of resources. This often occurs at the proposal stage where projects simply do not budget enough time, money, or man power to complete the development effort. Without that support in place, we can't even generate our planned outputs, let alone share them with others. Lack of preliminary assessment. Again, an early stage error that could result in reinventing something that's currently or had previously been on the market. In a worst case scenario, the plans may even involve reinventing something that the investigator doesn't realize is already patented which could lead to potential problems with patent infringement down the line. Failure to build a business case. Another early stage omission that could cost a project. Much like the 30,000-dollar iBot, if no one can afford to buy your amazing solution to a probable, it will fail. And similarly, if you can't demonstrate to a potential partner, licensee, or even customer why they should invest in your project, it's likely to fail.

Lack of intellectual property

TRENA BAUDER: This is an interesting barrier which isn't always present. Particularly in these industries, which many of the agencies R we're talking about relatively small group of potential users are buyers so when you contrast this to mass market providers that may appeal to hundreds or millions, it's easy to see why expensive intellectual property protection is not always necessary. Nonetheless, lacking it can cause a partner to question the idea of investing in the product when the idea may simply be copied by others.

Lastly, we have inadequate shopping of a technology. In this case, we're talking about a barrier very specific to communication. Without the right tools for outreach and without proper approach, it can be very difficult to gain buy in from a potential partner and often this activity may be left to a University's tech transfer office who has multiple projects to handle, many of which may be likely to produce larger returns for the University.

So what do we do about these potential barriers? First, when we think about insufficient allocation of resources, the problem may have been a lack of understanding regarding the necessary process for developing and transferring a device. The best place to attack this one is right at the proposal development stage. Here, we have a blank slate where we can allocate an appropriate amount of time and money to both development and transfer processes, and I'd recommend reviewing the Need to Knowledge models as you're beginning to flesh out your plan so you can be sure to account for all critical steps.

Next, overcoming barriers that could arise downstream by performing preliminary assessments early and often. The tech transfer planning template and industry profiles are a few tools of ours I'll talk about in just a couple slides, and these tools can help you to realistically gauge the size of the market, consider the needs and limitations of potential buyers of your device, and explore existing or potential competitors. Both of these resources offer many links to market research data sources, product listings, and methods for structuring an analysis of the marketing competition.

And you'll notice that I said this activity should be done early and often. What I mean is, of course, yes, explore the market prior to initiating a product but you should also revisit your assumptions during the development process. Markets change. Legislation changes, that could drive or kill a product purchase, and of course competition is always a moving target. So you'll have to maintain awareness of this as your timeline marches on.

Failure to build a business case is an obstacle that can be overcome using resources such as our primary research training module. Again, this is an example of the downstream barrier arising as a result of a failure to complete some early stage activity. So preparing the business case using the results of your scoping assessments would then prepare you to talk with potential partners and your tech transfer office about the value of your expected project output. And in fact, going back to a point made earlier by Chris McBride, the business case helps us to speak the same language as the folks who are dealing with an industry.

Next, barriers related to intellectual property. Again, these should be considered early on and the best first step if you're in a University would be to talk to your tech transfer office about options for protecting your intellectual property. It would also help to familiarize yourself with the protection options that are common to the industry segment you're working in. So would it be design patents or perhaps copy rights you're looking at? In the case of software, it may be a copyright.

In any place, NIDILRR's stage development can offer useful tips for your tech transfer. In this case, I think showing them what you're promising in your proposal, discussing NIDILRR's expectation based on that development would all be helpful to get you on a common footing. The NtK and TTPP also help you link to resources that discuss how and when intellectual property should be discussed and protected.

Finally, the the resources we mentioned before, the NtK, TTPT, and industry profiles, can help you craft and deliver a pointed message to collaborators that will help you avoid the inadequate shopping of technology. With the right tools such as a business case and value proposition, which may be part of a commercialization package, you'll find it’s much easier to get the attention of potential partners and to communicate your message.

All right, so now I've shared a bit about the barriers and potential carriers, so let's talk about these resources I've mentioned. First, I've r I'm very pleased to announce that we've just completed development of our technology transfer planning template, the TTPT, and you're actually the first group to hear that it can now be accessed on the KT website at www.KT4TT.Buffalo.edu. There, you'll find the link to the TTPT. This template was actually a result of my attendance at Melanie Barwitz course for the professional certificate. We were challenged to develop a KT plan for some project we were working on using her KT template. That spurred the idea that, geez, we need a similar template for technology transfer output. So what is the TTPT? It's an online planning tool for describing development projects. It asks simple questions, like what technical objectives are you planning to accomplish? What is your expected path to market? And who will use your product? And then it provides resources to help you answer those questions.

So, when it asks you about the size of the market, it's providing links to our industry profiles as well as to various disability statistics websites. Or when you're prompted to describe the competition, links are providedded to sample competing products charts which can then be used to document your findings as well as resources for locating the competition, suchs a links to the U.S. patent and trademark office and various technology listings.

So various output reports become available. Right now these include a commercialization plan, a technology transfer plan, and a summary report. Although we do have plans in the future to include a flow chart as well as a timeline.

So here we have a few more details about the resources embedded in the template. In terms of external resources, again, links to disability statistics sites, the USPTO, patent and trademark offices, and databases that contain information on companies. I've mentioned the industry profiles a couple times during this Webcast here and these documents cover a great deal of information on specific technology industry segment. So they're great resources if you're trying to document the state of the practice or learn more about where the gaps exist. The most recent edition, this includes three section. The first is called insights from industry, which shares insights from people with cognitive impairments and then the CEOs shared their comments about working with outside inventors, when to make that first contact, what you should have in hand, and where they feel additional developments are needed.

The second piece of that industry profile includes demographic resources which links to national surveys, data repositories, websites and other resources containing information on the demographics of that segment. And lastly, the company directory allows you to browse through a list of companies who manufacturer and retail products for those with cognitive impairments. This would be particularly helpful for locating suitable partners.

I did want to mention, actually, that industry profiles are also available on a few other industry segments. Each takes a different approach, but regardless they all contain information on available products, companies, demographic information and state of the practice. We've also included examples in the TTPT including a marketing report and a phase 2SBIR proposal to give you an idea of how this might be applied to creating those types of reports.

A few of the other resources include descriptions of over 50 tools for development and transfer that fall into the domains of business, engineering, and universal design and also a number of decides and handbooks dealing with intellectual property protection, a day by day chronological guide for inventors, some information on primary market research, evaluation, and this coming soon conducting competing product searches document is actually available now. So if you check out the website, in our resources page, you'll find that there.

So, quickly, I'll just describe the output reports. I mentioned that the first is a tech transfer plan. Now, all rehab engineering research centers are required to generate a tech transfer plan within their first year of funding so this would be perfect for that. It's aligning your input with the Need to Knowledge model steps which helps you to take stock of which a r what activities rebut completed, what's planned for the current cycle, and what might be missing.

Next is the SBIR output report. This aligns your input with the requirements for the phase II small business innovation research commercialization plan. So all agencies who offer small business innovation research require a commercialization plan as part of the Phase II proposals, so this would be perfect to input your information here, use the resources to answer the questions, and you'll have your resources available for proposal or communicating with partners or investors. Snoop lastly, the summary output report is structured in paragraph form using only high level information, so this is better for fleshing hot your development project ideas, when you're just beginning to craft your narratives for proposals, or to share some information with potential project partners.

Now we've talked about a few prosecutors, the tools we can use, let's tie this back into the theme of this conference, which is KT outcome measurements. Here we have a few examples of the NtK milestones and associated metrics that can be used to demonstrate each NIDILRR's stage of development. So first we could demonstrate feasibility through proof of concept stage activities which might involve the first four stages of the NtK model, and you might notice this is a change from the stages one through five that I described earlier in the presentation. And as I mentioned, it's not air clean one to one match here so there are actually many ways that the two frameworks could align. You but let's say your scoping activities demonstrated there was a viable market for the product concept, the research showed feasibility, and user feedback gathered in stage 4 also shows that there's potential interest for the product among consumers. In this case, the metrics might include achievement of proposed technical objective, identification of potentially viable path to market and/or market feasibility.

Now, for demonstrating that the product is realizable and demonstrating proof product development, NtK stages 4 through 6 might be relevant. So in this case, development activities may have resulted in the generation of an invention that is unique, feasible to produce and sell, and interest may have been expressed by a potential manufacturing partner. Metrics might include the integration of a working prototype, demonstrated consumer interest, commitment from a transfer partner, or the acquisition or transfer of intellectual property.

Lastly, in demonstrating that the product is beneficial, the NtK stages 8 and 9 would come into play. This is where the product has been launched, we've been monitoring it, we have some sales and market info on sales and use. Metrics here might include purchases or downloads, usage or abandonment, comparison with alternative products, or satisfaction statistics. You'll notice I've included a few references here and the first leads to one of the previously mentioned PowerPoint presentations on the stages of development provided by NIDILRR, and the second refers to a paper called, beyond technology transfer, quality impact from RND outcomes. This describes a series of three product quality efficacy conducted on AT devices and is available in volumes six through one of the journal of assistive technology.

So, with that, we've come to our summary. So, we can look back one more time here at the frameworks, models, and tools we can use to communicate with key stakeholders, new knowledge about our tech development projects and their outputs. So first, when communicating with NIDILRR and peer reviewers in a proposal, we can use the stages of development and the NtK model's stages and gate and detailed steps as a framework. This orients proposal readers to the current situation and plans for the project period. We can also compare project plans to the NtK stages and steps to ensure that all critical elements are included and needed resources are allocated appropriately. And finally, when the proposal evaluation criteria calls for it, of course, we must ensure that that the proposal refers to an appropriate stage of development for each development project.

After we've received funding, we can, again, use the NtK, this time as a checklist, though, for project activities, ticking off each step as it's completed. And in this case, we can demonstrate forward progress through the completion of each stage of development and NtK stage. Finally, and this should be a separate bullet, I apologize. We can share our project outputs with others, again, using guidance from the Need to Knowledge's model's KT tables.

When communicating with potential buyers and users or subscribers of the device, we can use potential knowledge to obtaining new input. The information we gather can be very helpful for ensuring the solution will meet consumer’s needs, again, an integrated knowledge approach here. For identifying the appropriate functions and features we should include in a device and of course for developing that business case that helps us communicate with project partners, investors, and potential licensing partners.

When communicating with the tech transfer office, we can use the Need to Knowledge model steps to identify gaps in expertise that the TTO may be able to fill. We can also share results from the NtK stage 2 scoping activities and the stage 4 business case to orient our tech transfer office in regards to the invention's market and the competition. Again, we have to keep in mind that tech transfer offices may not be familiar with our area of exploration so then it becomes our job to help educate them.

And finally, when communicating with industry partners or investors, we can use the Need to Knowledge model to demonstrate where an invention lies in the process and where additional support is needed, and we can also use the TTPT output reports to communicate those important details about our project plans and the anticipated invention or innovation output.

So with that, I have a few resources for you here. The fist is a guide to evaluation in the context of new product development. This resource offers methods, case studies, evaluation instruments and related resources. The next link is to the main page for our Need to Knowledge models, which include the KT tables. This will take you to the main page where you can get to all four variant models I described.

The third up is our link to technology transfer planning template. Please feel free to go in and use it. Like I say, this is sort of our soft launch today. We're just sharing the word now and looking for some user feedback so we can make our own refinements before we go on with a full scale launch. Link to industry profiles, again on cognition, vision, education, technology, and wheeled mobility. Primary market research training modules, this is specifically focused on groups and surveys and offers information on technology and tools if you're planning on conducting those. And the last is the chronological guide for inventors I mentioned which is a step by step how-to guide for new inventors. Listing of some references here. The first three are NIDILRR guidance on stages of research and development.

The last are a few of our publications which you may find helpful if you're engaging in these activities. We have my contact information, and I also have to give my disclaimer that the contents of this presentation were developed under the KT4TT grants as well as KTDRR. Please do not assume any endorsement by NIDILRR, ATL, AFF, or the federal government. I guess I will go back to the resources panel for anyone who wants to click the links and I think we have a few minutes for questions.

JOANN STARKS: Yes, we do. Thank you very much, Jennifer. That was a very interesting overview of so many of the activities that your project has been working on over some time. And I want to thank Jessica Chaiken for sharing the link to the technology transfer planning template. So, let's see if we do have any questions. I have one question that was submitted. How can you effectively overcome barriers to change among stakeholders and how to effectively apply tools for tracking implementation?

JENNIFER FLAGG: Could you repeat the first part again? The change part?

JOANN STARKS: Yes, how to effectively overcome barriers to change among stakeholders?

JENNIFER FLAGG: Well, that's a great question. I think the answer is really just keeping our finger on the pulse of whatever industry we're working in, right? I mean, in the context of technology development, we're always attending trade shows and conferences to see what's coming down the pipeline. We're talking with manufacturers to see what consumers are asking for. Of course with all of the technology development we're seeing these days, it's not only a moving target but it's a very fast moving target so I think just staying involved and having these conversations with key stakeholders continuously is the key. And then there was a second part of it with implementation?

JOANN STARKS: Yeah, the second part was how to effectively apply tools for tracking implementation. And this was related to enabling successful outcomes and to learn about effective strategies for measuring both change and impact.

JENNIFER FLAGG: Oh, great question. Well, pre and post surveys could be helpful, right? To see what people were doing before they had received your product and then evaluating begun after. I think that can be difficult, though, because we don't always have a very clear picture of who will be picking up our product to use it. In these studies I mentioned that is in assistive technology outcomes and benefits, they did a lot of comparison with products that people had previously been using, so that was one way to demonstrate that there was an actual impact achieved from the use of the product.

JOANN STARKS: Thank you very much. We have another question for you. Do you think this process would look different for different industries or economic sectors?

JENNIFER FLAGG: Great question. You know, to an extent, it would, only because we've included certain resources in the model that are specific to assistive technology and to medical devices. But, what we're finding is that these challenges persist in all industries. And in fact, we're in discussions right now with a gentleman from the department of transportation who is using our models for work in the DoT. So, really, of it comes from the fact that the initial model on commercial devices was developed using guidance from an international organization that wasn't focused on a particular industry. So, they really are very broad and overarching. Although, like I say, the resources that we provided are very specific to AT and medical technology.

JOANN STARKS: Great. Thank you very much. We have another question from Kathleen. Pointing out aspects specific to assistive technology is a great example of how this model applies specifically to disability domains. I guess that was really more of a comment than a question.

JENNIFER FLAGG: Great. Well, good. I'm glad that's helpful. And I think, like I say with the tech transfer planning model, I think that could be used by any industry, but the majority of the resources I provided are focused on our contacts which always has been assistive technology, rehab technology and medical devices. So again, very focused on disability but we are providing some links to, for example, the company databases, those cover all companies in the U.S.

JOANN STARKS: Okay. Well let's see if anybody else has a question for you, Jennifer. We'll wait just a second. We are a couple minutes ahead but we can wait and see if we have another question. If not, we can go ahead and get ready for our interactive discussion so let's see if anybody else does have a question that they would like to ask you. I see Peg Nosek is getting ready to type something. It sometimes takes a few minutes to come through in our chat box. We'll see if peg's question will come in in time. In the meantime, I just want to thank you for making your presentation, sharing all these tools with us, and it was a great list of resources and links that you've provided.

I think all of that will be really helpful and just, I want to thank you for that and also thank you for agreeing to stay on for the interactive discussion session that will be coming up next. We will have our other previous presenters, Chris McBride and Ron Saunders will also be with us and several people have volunteered to be reactors. Okay. I'm not seeing peg's question come through so I'm going to go ahead and wrap up this question. Again, thank you, Jennifer. Thank you to our other presenters.