Episode #7: Human Language Technology (HT) Industry Jobs (LCL Audio)

URL: https://www.linguisticscareercast.com/podcast/episode-7-human-language-technology-hlt-industry-jobs/

Laurel Sutton: Hello, and welcome to another Linguistics Careercast, the podcast devoted to exploring careers for linguists outside academia. I'm your host, Laurel Sutton. This episode is an audio version of a virtual panel held at the Linguistics Career Launch in the summer of 2021. The moderator is Alexandra Johnston. Our guest is Kelsey Kraus, a linguist and data scientist currently employed at Cisco Systems. In this panel, Kelsey presents an overview of selected jobs in the HT industry (that’s human language technology), many of which make use of skills in NLP, data science, and coding. She covers how to find them and what employers are looking for and discusses skills and self-promotion, tips on structuring your resume, and how to promote your research. She also addresses the common questions about technical skills that are required or not for industry work. Topics include HT, LinkedIn, the hiring process, job search, and linguists in tech.

Alexandra Johnston: Welcome, everyone, to this session of the Linguistics Career Launch. My name is Alex Johnston, and our session today is called “Human Computer Interaction: Jobs and Industry Overview.” And our presenter today is Kelsey Kraus, and I will let her give a fuller introduction to herself. Thank you so much for being here, Kelsey.

Kelsey Kraus: I'm going to talk today a little bit about human language technology and industry, just kind of a brief jobs overview. I want to kind of say upfront that while I do work at Cisco, I am not representing Cisco in any official capacity today. I'm just here as a linguist in tech, and I want to share my experience that I've had going through this process with you all. So I'm going to do a brief intro of myself, and then we're going to jump into two kind of distinct sections, so first, what careers are like for linguists in tech, and then kind of what the process is to apply for these jobs.

First of all, I want to just introduce myself. So I was a transfer student at UC Santa Cruz. I did my bachelor's in linguistics and in German Studies. Once I graduated, I also was a Fulbright English teaching assistant in Germany, in Berlin, where I taught English in a high school there. And I finished my PhD in linguistics on kind of the pragmatic interpretation of discourse particles and prosody at UC Santa Cruz in 2018. So that means I've been about three and a half years in the industry, and I've also had a couple of pretty distinct jobs. So first of all, I was a consultant. I was a contractor at Adecco, but I was working at Google. There, I was working as a linguistic project manager on the speech team, so basically we were creating new text-to-speech voices for the Google Assistant. In particular, I created, or helped create, the Hindi-English code-switching Google Assistant voice, as well as a couple of voices in French, and in German. So that was a contract position and so after that, I moved on to a full-time position at Amazon, where I was a language engineer. I'm not sure how much introduction we've had to language technology stuff before, but language engineers, it's kind of the opposite side of the speech track, so whereas at Google, I was working on the production of the voice from the assistant, on this side I was working on the interpretation of that voice. So, there, I was, you know, helping to design and build test grammars to train new features for Alexa, specifically for Alexa Auto, so they were building a competitor to Google Maps. So, if you have an Alexa and you say something like, you know, "Alexa, what's the shortest distance between Santa Cruz and San Jose?" that's a feature that I helped implement, for better or worse. So if there any bugs, I'm not working there anymore; please don't send them to me. And so currently, I am working at Cisco, so I am part a Voice User Interface designer, and I also do some data science and data analysis. So I've now kind of worked in all realms, as the voice user interface part is, you know, once you have the assistant which can understand you and talk back to you, you also have to be able to create dialogues and conversations that are going to be natural. So, you know, whenever you have a conversation with Sir or Alexa or Google, there's an actual flow behind it, that you enter into some sort of dialogue state, and we're trying to make natural dialogues there. So there, you kind of work a bit more with designers and researchers to refine these voice interactions. And then on the more data science and analysis part of things, we're also looking at the natural language understanding quality. So we do look at feedback from users. We look and see in log data that we have, maybe a user had an interaction where it ended every single time with them saying "no" or "cancel" to the assistant, so then you can go back and look and see, “Oh, you know, maybe something was happening there that was against the user's expectations,” and you can go back and kind of go through and figure out how you can change those things. That's a little bit of an intro to me.

We're going to now move into careers for linguists in tech, and I see here in the chat that they're going to have a panel on consulting and contracting a little bit, so this is good. This will be a little bit of an intro to what's to come in there. So I have this big disclaimer here because there is a difference between full-time employee jobs and tech vendor, vendor contractor positions as well. Some of the biggest differences between these things are full-time employees are, you know, the direct and permanent employees of a company. You're usually, you know, you have access to employer-sponsored benefits, so healthcare, equity, bonuses, promotions, things like that. You're usually salaried with paid time off, and there is relative job security. On the other hand, there is this divide between temps and vendors and contractors where a lot of the times you are working for an intermediary company or a staffing agency, but you're actually working with those direct full-time employees at the company. You're not usually performing the exact same tasks, though. These are usually fixed contracts, 3 to 6 months. For contractors, those can be extended up to two years. There's some differences between vendors. Vendors can actually be, their time frame for working is a little bit longer, and this is hourly, generally no PTO, but the contractor tech vendor category does offer a bit more flexibility in terms of working, a lot of the times from where you can work and things like that, although of course everything is shifting and changing in the last year.

I have kind of built this explanation or overview of these types of industry jobs into two continua. So these are my… My organization has these things, so, you know, don't go looking on Google or whatever to try to find these because they're mine. This is something that I have done to kind of help myself. Think about, “What is it that I'm actually looking for in a job?” So this first continuum is technically-oriented jobs, and what I mean by that is, what your employer needs or thinks they need in terms of specific quantitative or computational skills, and it's just a pretty basic, I've done it from less technical to fairly technical and we'll go through each of these here.

So, these less technical positions are things that, you know, they're all things that we have as linguists. Right? We have critical thinking skills, there's an emphasis on maybe technical writing or qualitative research. And these tend to be jobs that are a lot more user-focused or customer-focused. There's a specific end person that you're going to be working for and maybe working with. So curriculum designers, this is for this, this company in particular does curriculum for K-12 schools. There are things like linguistic project manager at Adecco. So, that's what I was doing when I was working at Google. So it was a bit less technical in the sense that I didn't need any scripting skills, and there was a lot of interacting between people and also projects, so these are going to be more people- and project-based jobs, a lot of the times.

Moving on to this moderately technical kind of in the middle portion, those are things where you're going to have a little bit more of that linguistic data analysis skill, where that's going to be more emphasized. You might need to know a little bit of coding, and definitely pattern recognition, which is something that we all have in common, something that we're all pretty good at. That's going to be something too that really puts you in a good position for these moderately technical jobs. Some job titles you might look for if you think that a moderately technical position is something that suits you well is something like an analytical linguist at Google, language engineer at Amazon or an associate or junior linguist at Adecco or Melon Technologies.

And then going on to the fairly technical aspect here. These focus a lot more on skills that maybe we might think are a bit more computer science-y or computational linguistics-adjacent or actually computational linguistics, so things like machine learning, natural language processing. You might need to do a lot of writing and reviewing code, and there's like a lot of quantitative research that's really expected of that.

I want to point out too that when you're searching for things, you really do need to look at… It's not just about the job title. It's about what's in the job description as well, because as you'll notice, Google, for example, their interpretation of what an analytical linguist does is much different from what an analytical linguist does at Spotify, and the same for the job title "language engineer" at Amazon versus Adecco. All of these things are, you know, out there and available, but unfortunately there's not a clear definition of what any of these things mean. I also wanted to point out too that these jobs that I have put in blue, these are all contractor positions. So, there's also not a clear distinction between whether or not a job is a contractor position and whether it's a full-time employee position based on the title alone. So what that means for us is that we really do have to focus on job descriptions and what it actually says in the details, but we'll get there in a second.

So, Aubrey, you ask, "Are most of these positions generally for PhD holders, or have you seen people with master's degrees as well in these positions?" It really just depends on the company and what they're looking for. I've seen a lot of masters degrees positions. Actually, probably most often people get jobs with masters degrees, especially at Amazon and maybe like Spotify. The fairly technical jobs actually tend to hire a lot of masters students, especially if you've specialized in computational linguistics or some sort of natural language processing, machine learning.

So let's move on to the second continuum. So here: this is more language-oriented jobs. So here, maybe you'll want some more linguistic or language expertise, or the employer will want a bit more linguistic or language expertise for these particular positions, so that here the continuum is from "not language-focused" to "very language-focused," and you'll notice too that there is some overlap on these two continua; it's not that these are completely separate. These are just ways, different ways of slicing up the pie. So for these not-language-focused jobs, these tend to track a bit more with those fairly technical jobs, so things like doing data analysis, Python scripting, model failure, a lot of the times they'll have titles like Research Scientist. There are a lot of these jobs that have a position of kind of being like a researcher, like just a regular researcher, but at a big company. Those can be pretty good positions for people with our skill set. So some of them are moderately language-focused positions, are actually the ones that usually have "linguist" or "language" or something in the title that we would recognize as being something that really fits our skill set. So, here, you know, you might need some subfield expertise, syntax, semantics, phonology, maybe some project management, maybe some language data analysis. So, for example, "moderately language-focused" could be something like, you know, you're analyzing failures for why the text-to-speech voice that you've just synthesized isn't sounding natural, and, you know, what you're doing is, you're doing linguistic pattern recognition. And maybe you notice that retroflex consonants aren't being produced with aspiration or not, if we're doing the, you know, Hindi-English code-switching voice. And that's something that, you know, maybe, if you didn't have that linguistics background, you wouldn't be able to hone in on that small piece of data, but with that language expertise or with that subfield expertise, being able to look at the phonologies and pull out these things, you are able to kind of, you know, understand what the problem is and where to go from there.

And then the last, the last circle here is the very-language-focused things, which, again, kind of track with the less technical jobs, but it’s not a complete overlap. So here there's a lot of… You know, the technical and creative writing stuff is is emphasized, but then there's also like actual language analytic expertise, so maybe you're a speaker of Bengali and you need — a particular company is looking for people who speak Bengali so that they can go in and annotate utterances. That's where, you know, that language expertise would be would be helpful.

Let's move on to kind of like the question that we've been kind of encountering that for the past couple of minutes, which is like, how do you actually look for these jobs? The most obvious thing, of course, is to go to the actual company that you are interested in and do these keyword searches on those company websites, so keyword search, you know, you think, “Okay, linguist, language," but there are all of these less obvious but still relevant things that linguists are working in. You know, maybe "speech data analyst" is something that this company thinks linguists do, and that's the term that they've decided on. At Apple, for example, there are a lot of linguists that are called oncologists, or taxonomists, instead of, you know, analytical linguist or computational linguist, so there's a lot of searching that you have to do, but once you kind of know what to search, these are things that they'll come. The jobs will come.

Another thing is to look for smaller companies or nonprofits, startups, and then also, you know, create a LinkedIn profile and set your job search preferences and create job alerts. And it's really, you know, as much as I kind of didn't want to create a LinkedIn account when I was first looking for jobs, it really, really helps, especially the more specific you get in terms of your skills, your skill sets that you have and the things that you say that you are an expert in, that you're interested in. That really helps kind of tailor those job alerts to to you and to your skill set.

Now I want to move on a little bit in the last couple minutes that I have before we open it up to questions about what the job application process really looks like, because, you know, for me, this was the scariest part, the part with the most unknowns, right? So, the one thing that I want to say is that there's no perfect formula for landing a job whatsoever, but what you want to do is focus on the things that are actually in your control. So that's what I'm going to be talking about in the next couple minutes is, like, job prep is about increasing your chances of being hired, and that is about focusing on the things that you can show to others, that you can show to others that you you've done. So, you know, getting your first job does take some work and also a bit of luck, but it will happen.

So, first of all, here is this hiring process overview. So the first thing you're going to do is, you're going to submit your resume. Maybe they require a cover letter. And this is really the part of the process that you control. You own this part of the process. Then, you know, there's also the hiring manager, which is the person that's going to receive your resume at some point. They usually make the final decision about your hire with the help of the rest of the team who you might interview with. They're going to be the most knowledgeable about the role, day to day. But in between the hiring manager and the rest of the team are the recruiters, and this is the wild card here, because unfortunately they are usually the least knowledgeable about the role, but they are also the gatekeeper to the role. So, it's the recruiter that you need to basically tailor... Well, you need to tailor your resume for the hiring manager and the rest of the team, but in a way that the recruiter can understand, and that they can then know to pass it along. So the next part of this is all going to be about how you can kind of optimize your chances there.

I've kind of summarized it in "three keys to job search success." So first is, define yourself clearly. Second is, invest in some tech skills. And then the third is, network, even if it feels bad.

So first, "define yourself clearly." You want to craft a resume and a profile. I'm going to just kind of talk through this a little bit, not super in depth. Mostly what I want to say is the things to emphasize. So skills, you want to break these into parts, which is a really important piece of advice I got early on. So, break it into things like your technical skills, skills that you have in the kind of projects that you've done, and then maybe your language skills. Secondly, it's kind of counterintuitive because we're used to writing CVs, where, you know, you really emphasize, "I worked with this person at this university and we did these projects," You really actually want to de-emphasize your education. A lot of the resumes that I've seen, you know, they'll have like two lines: where they got their BA, where they got their PhD or where they got their MA, maybe three, two to three lines, and that's it, there's really no other information about that, Which, which for someone coming from academia, you think, “Well, why wouldn't you want to know?” And then any supplemental skills or trainings or certificates, projects you've done. Use the rest of that space that you might have put emphasizing the education portion, use that to highlight your skills. So, research skills, project management, data collection, all of these things that we do as linguists that we might not think of as project management or data collection or things like that, you want to highlight those things. And then, very quickly, I want to talk about tailoring your resume to a job posting. So, in a lot of the resumes that I've looked at in the past couple of years, there's a little profile blurb at the top. It says something like where you graduated from, what your expertise is in, what you're looking for. This piece of advice does mean that you might need multiple copies of your resume. You have to tailor your resume for the job posting, for the recruiter, who's looking at the language of the job posting and looking for those skills that are in the job posting. So I'm not going to, you know, read through this again. You can look at this later, but just notice that like, if the language of the job posting says that they are looking for people who know how to improve acoustic and phonology models, you put "speech and acoustic patterns" in your resume profile. You put things like "experimental design," which can match up with things like "train and build models." So really looking at how the job has put together what they want in a candidate can really help you have the most success with getting to that recruiter, which means getting to the next level for interviews. Another thing you want to do is situate yourself as who you are. This may not work for everyone, but I got a piece of advice recently that said, since a lot of the job postings aren't looking for specifically a linguist, what you want to do is position yourself as a researcher, as a data scientist, first and foremost as something familiar, and then bring in those linguistic skills on top as something that sets you apart from other candidates and in the job pool. So why are you the one to hire? Why do you the one that should get this position? I think thinking about it in this way is easier for recruiters and easier for hiring managers, because linguists are kind of few and far between in a lot of companies. And so, you know, just saying that you are this thing but you're also a linguist on top of it, might make you stand out that much more.

Second key is "Invest in tech skills." If you don't have some basic data manipulation skills or know a little bit about speech and language processing, or if you're interested, do some coding courses or boot camps. There's some good free ones out there, too. Definitely invest in in things like that. And then also kind of as a corollary, know that the skills that you do have already are transferable and know how you can frame it. The third key is, network, even if it feels bad. These are links to two LinkedIn profiles. I've gotten okay from them. They're okay to be used, so you can go there and you can look at them. Some of the things to really note about their profiles are the level of description that they provide in their previous jobs. They also provide things like their licenses and their certifications, so, you know, they took little UX courses and they put that in there, or they've took project management courses, and they put the certificate that you get in there. And hiring managers and team members that you're going to be working with, they're probably going to look you up on LinkedIn, and they're going to see these things and they're going to say, “Okay, this person is serious. They've done these courses. They have these skills. They've been endorsed for these particular things.” And then, again, reach out to those contacts, those friends, acquaintances, friends of friends. Do the informational interview. That might be a U.S.-specific thing, but it sounds like from my experience, looking for jobs in the U.S., everybody that I've reached out to has been totally willing to do, you know, 20-minute in-person chat or over Zoom. No big deal. And really the worst case scenario is that they don't respond, and there's really not much to lose. Most people are really happy to help, actually. And the best case, they can hand your resume right to a recruiter, which is really the best-case scenario. Thank you so much, and we can do questions now.

Alexandra Johnston: So one question was about timeline, because timeline in the industries that support these kinds of positions is very different from academia, which is very different from federal job hiring, so what's the timeline if you graduate, for example, in summer 2022, what would be a good time to start submitting applications?

Kelsey Kraus: That's a really good question. Unfortunately, it kind of depends on the company. But I would say probably three to four months before you want to have the position, start applying for the position. Of course you're probably not going to hear back from everybody that you apply to, and some people are faster than others. So, a couple of just anecdotal experiences. So contractors tend to get back to you much quicker. They tend to have a higher immediate need, so getting a contract position is probably the quickest way to get into this. There's some debate as to whether getting a contracting position will then be able to launch you into a full-time position if that's what you're looking for, but we'll put that aside. For Amazon, they're actually really quick. So when I interviewed for Amazon, I submitted my resume at the end of November. I got a call back in December, and then interviewed the first week of January, and started the second week of February. So that was really a little, like all things told, between when I applied and when I got the job was just a little bit under three months, and then started a little bit later than that. I have also heard of people at Google, where their job process has gone on for six, seven months because they kind of hire for the role, and if there's no role filled but you've gotten the role, then you can kind of just be in this limbo phase until that role opens up again.

Alexandra Johnston: Thanks for talking about the variation in timeline. One thing I want to differentiate is sort of your active job search time and everything that precedes that, and really what you want to be doing starting now is investing time in building out your network, which is what is going to pay off later when you are in the active phase of applying for your jobs, because what networking does and what informational interviewing does, that is your research project, and that will help you hone the areas, the sectors, and the types of jobs that may be a good fit for you. So what you want to avoid doing is, end of fall semester, beginning of spring semester before you graduate, you want to avoid, suddenly starting then and, “What am I going to do? What's a good fit for me?” Invest time now, during this month, this is what we're here for, in building out your network and learning about different positions, learning about different levels of positions, day to day life. That's what's going to pay off later when you search for announcements. You'll have that knowledge in the back of your brain about what organizations you want to target, what sectors are the right fit, who can look over your resume for you, so you're in the right place to start now looking for those jobs. One question further back that was duplicated about what tech skills should we learn, and where should we start?

Kelsey Kraus: I think that that really depends on what kind of job you're looking for. So if you're looking for a position that is in the natural language understanding, natural language processing realm, a really good place to start is actually Jurassic and Martin's *Speech and Language Processing* book. It gives a really great overview written by linguist, so in language that we understand, of just what goes into building a voice assistant, basically, building speech processing models, building language processing models. From there, then, they do have,some exercises and like assignments that you can assign yourself, and from there you can kind of see like, “Oh, you know, are my Python skills good enough that I can just manipulate the things that are here for my own needs, or do I need to do a little bit more focused study on how to manipulate things in Python?” A really good thing is just like knowing your way around the command line in your vision for the kind of job that you want in the future. And then just basic familiarity with Excel data analysis. So, you know, can you can you look at a bunch of numbers and make sure whether things are statistically significant? One thing that people are really interested in right now is inter-annotator agreement. So there's a lot of annotation that goes on and from different annotators, and so how can you be sure that we're getting good data from these annotators that you might know or that you might just have gotten through Mechanical Turk? So, those kind of things are good, just as jumping off points.

Alexandra Johnston: Kelsey, when you just raised this term that's new to me of "inter-annotator agreement," and that [unclear 29:27] the type of work, this is an area which I think would relate to people who study applied linguistics and who focus on inter-rater reliability.

Kelsey Kraus: Absolutely, yep.

Alexandra Johnston: Transferable skill, and that's an example of language you would want to adopt. You would want to look for that, and you would want to adopt it in your own materials. Don't necessarily talk about yourself as having experienced in inter-rater reliability. Draw that connection [unclear 29:55].

Kelsey Kraus: Exactly.

Alexandra Johnston: Kelsey, if you don't mind There's a question getting a lot of traction in the chat. "What about if a job says they require five years of experience in the field, but you meet all other requirements? I just saw this for language engineer job at Amazon. How much do they care about work experience if you have a strong linguistic background or a PhD?”

Kelsey Kraus: They should just apply anyway. That is my advice. Just apply anyway. A lot of these companies, they say that they want five years of experience but in a lot of cases — you know, Alexa has only been around since 2014, so you'd have to have been working on Alexa since 2016 to have five years of experience in that position. So those are pretty flexible, usually, and also, you know, you have… If you're in a MA program, a PhD program, count those years as experience. Those are years of linguistic experience. You are a linguistic professional. Count those years. There's one thing I want to address. So Christina in the chat asks, "Was there really only one interview for Amazon?" No, there was one phone interview, and then there was a whole day of five interviews. That was in person. So it was pretty rigorous, but the turnaround time for Amazon scheduling those interviews was pretty, pretty small.

Alexandra Johnston: Yes. you're back. Thank you.

Wei Lai: Oh, hi. I'm wondering about switches between jobs, like if you did a contractor job, and then you want to switch to something better, but then you're afraid of offending people at your original position, how do you deal with that, and when do you let people know that you're going to do the switching?

Kelsey Kraus: So I think specifically between contractor positions and full-time positions, I think people are really understanding, especially in my experience, because they know that you're a contractor, this is a limited time that you're going to be spending. They have to know that you're going to be looking for other opportunities while you're doing that. And so when I transitioned from being a contractor to being a full-time employee, I think I gave maybe two weeks’ notice but then ended up… There was a project that I was kind of passionate about and really wanted to see to the end, so I ended up going for three weeks. It was not as hard as you would have thought it would be, Then switching between full-time roles, in my experience, it was a bit difficult. You know, of course the position that you're at doesn't want to see you go, but it really is dependent on what you see for yourself as something that's going to be what you want, and when I was at Amazon, I realized, “You know, this is not really the position that I want. It's not the thing that is working for me right now,” and, you know, when I had that conversation with my manager at that time, he was sad to see me go. He wanted to try to get me to stay but ultimately, you know, realized that it was the best decision for me, and I still do have good relationships with all the people that I've worked with at Amazon. You know, you don't want to burn the bridge, obviously, but I think people are really understanding about that.

Charlotte: So I wanted to ask a question that was asked in the chat by Wei, was the question of citizenship. We started a Slack channel to have international people talk amongst each other to talk about visa processes, and so I think a lot of us would like to know, are there constraints in terms of citizenship and work permits in tech? I'm on a student visa right now, and I can get an OPT visa after that, but then if I want to continue, I would have to have like an H-1B, or something like that. And so if you know anything about the recruitment of people who are not citizens.

Kelsey Kraus: I think that that that's a really great point to bring up, and I think that, at least from co-workers that I've had, it's not an easy process, but if you're the right fit for the position and they're the person that they want, those employers are going to do whatever they can in their power to help you out with that. You know, that doesn't necessarily mean that visa and immigration services are going to be… That's not going to be any easier than it is, you know, but the company, at least, if they're hiring you, they have your back on that. And I do know a couple of people who transitioned off of an OPT visa onto an H-1B. There were a couple hiccups. It was pretty stressful for her for a couple of weeks but it did work, and she's still employed, and it's totally fine.

Alexandra Johnston: I want to thank our presenter Kelsey Kraus. Thank you so much for being with us today.

Kelsey Kraus: Thank you for having me. It was great to talk to you all, and if you have any questions, feel free to reach out to me, add me on LinkedIn. Find me wherever. Send me an email. I'm super willing to talk to people to help more linguists get into tech.

Laurel Sutton: Linguistics Career Launch 2021 was a one-month intensive program intended to familiarize linguistics students and faculty with career options beyond academia, in business, tech, government, and nonprofit organizations. Videos of all our recorded sessions are available on our YouTube channel. LCL 2021 was organized by Nancy Frishberg, Alexandra Johnston, Emily Pace, Susan Steele, and Laurel Sutton. You can get in touch at linguisticscareerlaunch@gmail.com.