

In this module, I'd like to present some information about Privacy, Discoverability, Openness, and Publicity. The first thing you might ask yourself is:

Slide 2: Why are these issues relevant to us?

Why are these issues relevant to us? And one of the reasons they are relevant is that often as computer scientists and engineers, we focus on the best technology, but many of us often forget about the social aspects of what we do. And as professionals that is incorrect, we should be thinking about the social aspects. And one of the errors that we often forget this privacy. And of course, if the systems that we're producing violate a user's privacy this may cause them not to want to use them, and therefore we need to take into considerations of privacy, personal integrity, and other social issues as we do our work, as we formulate our problems, and as we go about solving them. So, over the course of this talk, we are going to talk about discoverability - the ability to find information. Openness - having the information actually be open and available. And publicity - proactively trying to publicize the work that it is that you have done.

Slide 3: Purposes of this lecture

So, let's begin by taking a look at What's the purpose of this? Why am I giving this particular presentation? Well, one is I want to convey to you some of the information that you'll find useful in doing your own projects, both now and in the future. And to make sure that you're aware of some of the social issues that you need to consider. And, in some cases, these are legal and ethical reasons - so I don't want you to get in trouble because you've done something either illegal or unethical. But, I also want to encourage you to read critically. It's very important that you learn how to read critically. And you see that one of the things that I've done, and it's in this light blue type. Is to abstract what it is that you read. So, how can you take up a large body of material and reduce it to the essence of it - the key abstract concepts. And, of course, another reason for this particular module is to encourage you to make your own research results public, while respecting the privacy of individuals, protecting their personal integrity, protecting intellectual property, and other rights and of course finally to encourage you to be as visible as possible as a professional - you want to be known for the work that you do, and what do you want others to know "Aha! If I want to know about this - this is the person that I need to talk to, read what it is that written, etc.".

Slide 4: Swedish Constitution

So, if you look from a fundamental point of view in Sweden - Swedish law is based upon a constitution. And it has four fundamental parts: One The Law of the Instrument of Government. The Act of Succession. And two parts that are particularly concerned us The Freedom of the Press Act and the Fundamental Law on Freedom of Expression. Now, in the Swedish Constitution, we are told, "The fundamental laws take precedence over all other laws. This means that other laws may never conflict with the provisions of the fundamental laws." So, learning these fundamentals is truly fundamental because other laws must follow from them.

Slide 5: The Freedom of the Press Act (Sweden)

So, The Freedom of the Press Act actually is derived from the freedom of the press act "Tryckfrihetsordningen" in 1766, and it is one of the earliest Freedom of Information Acts in the world. And the fundamental idea is "offentlighetsprincipen" the principle of publicity - to have a free and open and democratic society, it was determined that it was very important that people should have the ability to freely access information. And therefore, it was very important that the press be free that we can publish things to inform others.

Slide 6: The Freedom of the Press Act (continued)

Now, in article one of chapter two - on official major public documents says, "Every Swedish citizen shall be entitled to have free access to official documents, in order to encourage the free exchange of opinion and the availability of comprehensive information." If you don't know about it, you can't say, "No. I object to this. we should instead be doing that." So, the idea is to make all of this information as readily available as possible.

Slide 7: The Freedom of the Press Act (continued) – 7 restricted areas

And, in Sweden, as we can see here, the only seven different types of information in official documents that can be restricted. Not surprisingly, the security of the Realm, national security, central fiscal policy, supervisory activities of a public authority, in the interest of preventing and prosecuting crimes, economic interest to public institutions, and the sixth -the protection of personal economics of the circumstances of private subjects, and the seventh - and only remaining reason that things can be restricted from being public - is the preservation of animal or plant species.

Slide 8: The Freedom of the Press Act (continued) – restrictions circumscribed

Now. What does that mean? That means that any of those things which are restricted, the actual restrictions have to be spelled out in a special act of the law. The government has to set who the authority is and the details for how that information is to be restricted (when it's restricted) and how it's to be made available.

Slide 9: EU context wrt “public” documents

Now, if we look at a more general context, the European Union in directive 2003/98/EC says, on the general principle "Member States shall ensure that, where the re-use of documents held by public sector bodies is allowed, these documents shall be re-usable for commercial or non-commercial purposes in accordance with the conditions set out in Chapters III and IV. [of this directive] Where possible, documents shall be made available through electronic means." This means, that if there is an electronic list, for instance, of the geographic coordinates of each base station that is maintained by a public authority - that information should not only be available but it should be available in digital form so that someone else,

for instance, could use of that to build a database to do something like making a location-aware service. They would just listen for the identities of the different base stations and say, "I can hear the several different base stations. Boom! I must be at this particular location (approximately). "

Slide 10: EU context wrt "public" documents

Now the EU goes on to further describe the public documents and says that the goal is, of course, we want people "to gain new ways of accessing and acquiring knowledge". This is about data mining and data science. Take that information that we already have. Part of the reason for this is to create new jobs, new companies are going to come along and say, "mmhm We are collecting this information about the number of cars that pass this point - so that we can have a congestion tax so we can discourage people from driving into this area - but if I have access to that information - I could build a service that with, for instance, adjust my parking prices that I have based upon the number of cars that are available so when there are lots of cars I could increase my prices when their few cars I might lower my prices perhaps encouraging people to come in there is available parking places, and the parking place plus the tax is going to be sufficient to motivate them to enter the city." There all kinds of public information that is collected, and the EU document says basically we want to try to make it available, particularly in many cases, to help people produce new wireless content services. So, I could get the information about the density of cars in a particular area on my wireless device, and that might guide me to change my behavior.

Slide 11: European Union Directive 2003/98/EC (continued)

The EU document goes on further, and it says that the time limit for replying to requests for reasonable information should be reasonable. So, I shouldn't get the data when it's too late to actually be useful to me. I should be able to get it in a timely fashion. And, of course, public sector documents should be made available in the preexisting format or language through appropriate means where possible. So, I should be able to get in a digital form - so that I can process it. I shouldn't have to get it on a piece of paper, OCR it, deal with the mistakes in the OCR, and then be able to do it - I should get it already in a digital form. Not only that, but the EU further and says not only should this information be available - the public agency should make indices so that I can actually go and find the information, so I know which documents or other information to ask for.

Slide 12: European Union Directive 2003/98/EC (continued)

And, of course, an element is making all the publicly available documents held by the public sector actually available. And if there are license terms associated with them - they should be fair and transparent. So they shouldn't discriminate - if I'm going to charge for this, then here's the price, and I shouldn't have exclusive agreements - so one entity can get the data and say, "Ooop! No, sorry we sold that data - no one else can have it.", because they wanted to encourage competition. But the directive says that they also need to protect personal data. There is also a need to protect intellectual property. And therefore, we have to be concerned

about other people's intellectual property that's actually used in the course of the public document and must not infringe upon their rights.

Slide 13: Swedish context wrt “public” documents

Now, in Sweden that European directive got translated into what is called the Public Sector Information law "Lag 2010:566" it says "to promote the development of an information market by facilitating re-use by individuals of documents supplied by the authorities on conditions that cannot be used to restrict competition." Interestingly enough, software in the form of programs are not documents in Sweden. And documents of education, research institutions, and culture institutions are not covered by this law. So, there the intellectual property [is the property] of their owners. And it doesn't apply to documents whose rights are owned by third parties. But one of the most interesting features is that the fees for documents cannot exceed the cost of collection, production, reproduction, and dissemination, and a reasonable return on investment. So, that means you can't just say, "Ah! The way I am going to prevent people from accessing this information is going to be to set a huge price on it, and no one will bother to ask for it". No, it's only allowed to have a small little mark up above the costs.

Slide 14: Finnish context wrt “public” documents

Now, in Finland, there is a somewhat different interpretation. In Finland, the Act on the Openness of Government Activities of 1999 spells out the authorities have to respond to requests for information; they must also provide and promote information openness. One of the fascinating things here is they really taken this idea indices to be fundamental. They really want to facilitate individuals and companies being able to find this information and use it. And they said the reason is they want "to promote openness and good practice on information management in government" I this, of course, "private individuals and corporations with an opportunity to monitor the exercise of public authority and the use of public resources, to freely form an opinion, to influence the exercise of public authority, and to protect their rights and interests."

Slide 15: The Freedom of the Press Act (continued)

Now, The Freedom of the Press Act in Sweden says, "Document is understood to mean any written or pictorial matter or recording which may be read listen to or otherwise comprehended only using technical aids.". So, that means nearly any kind of information that you can imagine that's been turned into some concrete form is a document. But a compilation of information taken strictly from recordings for automated data processing is not regarded as held by the authority if the compilation contains personal information. And the authority is not authorized by the law to make the compilation available. So, that means, the personal information, in this case, the information could refer back to a person, an individual - either directly or indirectly- is personal information. So, what do we gain from this? Well, we can summarize it in the bottom line there saying, "the format doesn't matter, but personal

information may be protected" So this compilation, if it includes personal information, it can be restricted from being given out because of the personal information that it contains.

Slide 16: The Freedom of the Press Act (continued)

Interestingly enough, a letter or other communications sent to a government agency in their role as a public official is deemed to be an official document. That means, for instance, email sent to me at KTH is by and large public. It says that the legislative entities, in this case, the Riksdag and other assemblies are not exempt from this. The rule applies to them. And interestingly enough, physical mail received by a public authority is also subject to being archived, cataloged, etc. So most physical mail to the government is public.

Side 17: The Freedom of the Press Act (continued)

In article seven, it goes on to define when the document becomes public. And this is very important because a document really only becomes a public document when it becomes an official document. So working drafts, working papers, etc. are not official documents. So there is no obligation by authorities to produce this information, but when it is a final document, for instance, your master's thesis - when the examiner has signed off on it, and it has become official - at that point, it is now an official public document.

Slide 18: The Freedom of the Press Act (continued)

That leads to article number nine, which defines this working document exception. There's also article ten that says just because a public authority has a copy of it doesn't make it a public /authority/[document] - if the whole reason for holding it is simply for storage.

Slide 19: The Freedom of the Press Act (continued)

There are also some exempt documents: things that are being held for safekeeping, for forwarding, etc.

Slide 20: The Freedom of the Press Act (continued)

An official document to which the public has access shall be made available on request forthwith. That means that actually, it is one of the few things where the government has an obligation to respond to in a very timely manner - to produce a copy of this public document. It can be a transcript or copy of the document, and if we summarize it, "the request for transcripts or copies of all official documents should be dealt with promptly".

Slide 21: The Freedom of the Press Act (continued)

Now, if you go and ask for an official document, you don't have to disclose who you are, except in so far as there may be a need to do judge whether there's an obstacle for the release of the document. So, for example, there might be a situation where there's a protection order -

where someone who has committed abuse of another person couldn't receive information about them - even though it was a public document - that would lead to the risk to the individual, therefore that they could be denied being given the document - even though it's a public document.

Slide 22: The Freedom of the Press Act (continued)

You have a right to appeal if the request is denied, and you have the right to know the grounds for the denial.

Slide 23: The Freedom of the Press Act (continued)

Interestingly enough, if the government does have the document but, for example, in the case of the divorce between the Church of Sweden and the government records are transferred from one to the other - the right to access them still continues - even though there is now a private body holding those documents.

Slide 24: The Freedom of the Press Act (continued)

Now, does that mean that everything just keeps accreting - the archive keeps growing? No, it actually spells out that it is possible to dispose of documents, but there has to be a procedure and a defined procedure for getting rid of them. So it is possible to say, "Yes, things older than this period of time, things considering amounts less than this, etc. after this period of time - they're going to be disposed of."

Slide 25: Does this only concern government produced documents?

So, does this is the only concern public document?

Slide 26: Sarbanes-Oxley [Sarbanes-Oxley2002], Health Insurance Portability and Accountability Act (HIPAA) [HIPAA], FRA-lagen [SFS2008:717], ...

Well, if we take a look around the world, for example, in the US there is a Sarbanes-Oxley law that came into effect in 2002 - this says in fact that businesses have to retain certain data. Why? Because they may need to be audited afterward to see did they correctly deal with things, were corporate officials providing information to some parties and not others, thus giving some parties an advantage. We also have HIPPA - the Health Insurance Portability and Accounting Act, which specifies that everyone who accesses a patient record, medical record, we have to keep track of who accessed it and why did they access it. Do they have the authority to access it, etc? In the case of telecom operators, we have the requirement, in many cases, that the call detail records have to be retained. Or ISPs in many countries are required to keep the URLs each subscriber puts into a search engine and sends out via their network. In Sweden, we also have the FRA-lagen specifying how those ISPs or telecom operators have to provide information to the government - in this case, the agency FRA - for

use whatever information is passing across the border the board of Sweden for dealing with terrorism and other such activities.

Slide 27: Personal Data Act (PUL): 29 April 1998

Now another law that you need to be aware of as a researcher in Sweden is called the Personal Data Act (PUL). It was introduced in April of nineteen ninety-eight, and the purpose of this act was to protect people from the violation of their personal integrity when people are processing their data. So the act, not surprisingly, specifies what processing of personal data means and what personal data means. Personal data, in this case is all kinds of information that directly or indirectly may refer to a natural person who is alive. Once you are dead, it's not personal data anymore. And the processing can include all the different kinds of things that you might think of about processing.

Slide 28: PUL §5: Processing of personal data subject to the act

So, section five of PUL talks about what he is processing or processable personal data, and it basically means that we have done some processing, for instance, to form a structured collection of information - so that now can be searched or a compilation of information according to some criteria - everyone who raised more than (you know= two hundred kilograms or something like that. All of those certain instances of processing.

Slide 29: PUL §6: Exemption of private processing of personal data

Now, there is an exception for personal record keeping. So, it's okay - that I'm allowed to have in my pocket my list of (yes) phone numbers or email addresses. They are not public documents. That is also not a matter of processing the data - even if I put it into my computer - because those activities are of a personal or private nature. So keeping private records is okay.

Slide 30: PUL §7: Relationship to freedom of the press and freedom of expression

Now, the fundamental law The Freedom of Expression and The Law for Freedom of the Press take precedence. So, that means there are actually situations where certain parts of PUL don't have to be followed- because of journalistic purposes or artistic or literary expression. So that may mean that a journalist who may access data that would normally be protected by PUL because it's important to report that criminal activity may be taking place or that a law hasn't been applied as it perhaps should be.

Slide 31: PUL §8: Relationship to the principle of public access to official documents

Now, personal data can be within public documents. So that means, of course, we have to, in many cases, extract them from the public documents and not release that when there a request for the public document.

Slide 32: PUL §9: Fundamental requirements for processing of personal data

Now, section nine of PUL talks about the fundamental requirements for the processing of personal data. So, if you are responsible for a system that is going to process personal data, you have to ensure - first of all - that whatever that processing is- it must be lawful. You can do something which is against the law. You have to protect the data. So, that means you have to process it in the correct manner and in keeping with good practice. And data can only be /protected first/ collected for a specific purpose, and it can only be used in keeping with that purpose. And this causes us some tension as researchers - because sometimes data is collected for one purpose and people have agreed to provide the data for that purpose. But now someone else comes along and says, "but I could use that data for something else - Can I use that data?" And the answer is no - because it's not in keeping with why the data was originally provided. You have to make sure that the personal data isn't processed for any purpose that's incompatible with that for which the information was collected. So, yes - I have got this data in my database, but now I can't let you do a query against that for this thing, which is not associated with why the data was collected. You also have to make sure that the data was adequate and relevant. And no more data than is necessary is collected. That means it's actually illegal to collect data that is unnecessary. You have to ensure that the data is, of course, correct and, if necessary, that it is up to date. And you, of course, have to make sure that it is blocked or erased or corrected if the data is incorrect. The individual has the right to ensure that it be corrected. And, of course, personal data should not be kept for any longer than is necessary for the purpose for which the data was collected.

Slide 33: PUL §9 requirements - continued

Now there are some exceptions for this. For example, it may be the case that we need to save personal data for historical, statistical, or scientific purposes - that is not incompatible with their purpose the data was collected for. If it's incompatible with the purpose, the data was collected for, and then we can only keep it for those reasons. Now, if we take a look at this whole set of things in section nine - what it means is there has to be an _extraordinary_ reason to overcome the vital interest of an individual person. So if it is my data in the database, I should be able to control it, unless there's some very vital reason for the society that that data needs to be retained. If I want to delete it, I should be able to have it deleted. That means that it's actually important to forget. Now many of us, whenever we design systems, don't include the idea of forgetting. It just keeps accreting and accreting, and that is not in keeping with PUL.

Slide 34: PUL §10: When processing of personal data is permitted

So, when is the processing of personal data permitted. Well, section ten of PUL describes that. And not surprisingly, we have the ability to process the data what we have to do it to perform a contract, where we have a legal obligation, where the vital interests of the registered person have to be protected (I'm run over, they find the body in the street, they may need to find out am I allergic to penicillin - in which case, they may be able to go in and look at my personal data to establish that stuff before they decide to inject penicillin into me, etc.), when the task supports the public interest, or the exercise of official authority and where there is a legitimate interest. So the controller of this data has to weigh the importance between the protection of the violation of the personal integrity of the person with the interest for releasing that information.

Slide 35: PUL §11: Direct Marketing

Now, section eleven of the law describes the direct market, and it says that as a person I have the right to be able to say, "No, I don't wish to make this data available to anyone for the purpose of direct marketing" and they must /reflect/ respect that decision.

Slide 36: PUL §12: Revocation of consent

I can also revoke my consent. I can say, "yes, you're allowed to keep those records," but now I can go back and say, "No, you can't keep those records anymore" But I can't block everything - but I can block quite a few things.

Slide 37: PUL §13: Prohibition of processing of *sensitive personal data*

Now, section thirteen of the law describes what is called *_sensitive personal data_* and this is data about race or ethnic origin, political opinions, religious/philosophic beliefs, and membership in a trade union, and also includes things, such as health information or a person's sexual orientation or sex life. So, these are considered sensitive personal data. And the act goes on to describe how this sensitive personal data can be processed and who can process it.

Slide 38: PUL §14: Exemptions from the prohibition of processing of *sensitive personal data*

Now, there is some small set of exemptions for how it can be processed, how it can be publicized, etc. But the key features are, of course, that again the controller who is responsible for this data has to ensure that the data is processed in a correct manner following the interest of the person and with respecting the legal aim.

Slide 39: PUL §16: Necessary processing

So, for example, there are certain necessary provisions - so, for example, in employment law, it may be necessary to actually disclose information, but the person has consented to the

release of this personal information. So, I want to be employed by this company; therefore I consented to say, "yes, you're allowed to have access to this information that otherwise wouldn't be available to you" That is possible because it is in my interest, I want to have that job.

Slide 40: PUL §17: Non-profit organizations

Now, there's an interesting exemption in section seventeen for non-profit organizations. So non-profits can actually keep information about their members that might otherwise be sensitive. And the reason is because the member of the organization has _explicitly_ consented to this.

Slide 41: PUL §18: Health and hospital care

Section eighteen talks about health care and hospital care. And anyone working in this industry has a professional duty to maintain the confidentiality of this data. So there are healthcare exceptions.

Slide 42: PUL §19: Research and statistics

Researchers and statisticians also have an obligation. So if we're going to conduct research, we have to make sure that the research is approved by an ethics committee to make sure that we don't do something that's going to be in violation of the personal integrity. And, of course, we are covered under various rules of secrecy and confidentiality in dealing with that information.

Slide 43: PUL continued

Sections twenty and twenty-one go on about further exemptions and official legal offenses where only public authorities can keep that information.

Slide 44: PUL §22: Processing of personal identity numbers

Section twenty-two says there are special rules about the processing of personal identifiers. That is why it is very, very important here at KTH that you don't give out your personal ID except in those situations when you really need to, such as, when you provided to get your KTH identifier - once you have that you should be using your KTH identifier - not be using your personal identifier.

Slide 45: Information to the registered person

The person whose information has been collected or is stored or is being processed has the right to be able to get that information, and they have the right to rectify it, etc.

Slide 46: Security in processing

Now, the controller of this data has to make sure that they are appropriately protecting the data when they are processing it. That means they have to consider the technical possibilities of protecting it, what it cost to implement the measures, if there any special risk about processing the personal data, and they have to consider explicitly how sensitive the data is . as they decide upon their means for securing, storing, and processing that data.

Slide 47: Transfer of personal data to a third country

Not surprisingly, section thirty-three, thirty-four, and thirty-five discuss the matter of transferring personal data to third parties. And that is a particular concern for those of us in ICT with the increasing use of cloud computing. So you need to make sure that you know where your data is actually being process - so you don't inadvertently move this personal data outside of an area where it's allowed to be kept. In some cases, there are treaties regarding this, with so-called safe havens but you need to be aware of it because otherwise, you may (in fact) violate the law when you move the data into the cloud.

Slide 48: PUL continued

There are lots of other things in PUL describing penalties, damages, appeals, etc. But I leave that to your further reading. But you've seen some of the highlights of it, and you've seen this effort that I made to try to abstract it - to identify the particular sentences in each of these things that are particularly relevant to us. And you should be doing that as you read any document.

Slide 49: Open by default

So one of the things that you have hopefully gathered from this - is at least here within Sweden it's very important that public documents (in fact) the public and that they are made available. So increasingly, lots of people are approaching their research activities in terms of having them open by default. They want open-source software, they want open-source hardware, and therefore not surprisingly, there are people who are considering how is it they should go about promoting your own work.

Slide 50: Promoting ones work

So, Dennis Meredith, in this book called "Explaining Research: How to reach key audiences to advance your work", discusses how you can actively promote your work - getting more people to know about your work. But he points out that actively promoting your work is actually going to take extra work - you have to go to the effort of doing it - it doesn't magically happen.

Slide 51: Explaining your research is a professional responsibility and frequently a necessity

Now, explaining your research is part of your professional responsibilities, and that is frequently a necessity. And therefore you need to think about "okay. What do I need to do?" Well, if I am an academic researcher, that typically means I need to publish it. Because publishing is crucial for being recruited, getting promoted, getting tenure, getting more funding for more research, etc. For industrial researchers, promoting your results is often critically important for getting employed, being promoted, and (yes) getting funding for more research. The reason is that, of course, by getting your work known - your ideas get evaluated by your peers, and you have the chance to influence what your peers do and what others do. And, of course, it's really essential that you make your effort to publish your work, to publicize it, to achieve success - both in your research and in your career. Why? In research, we want other people to know you're working on, so when they find relevant results, then they say, "Oh yeah! That guy Maguire, I know he was working on something related to this - why don't I send him a copy of a preprint of the paper before it's come out in the journal so he can know about it and build on this" or "yes, I know this person, who has a related result to it - mine don't seem to match her results - so let me talk to her and let's see if perhaps we should do a joint project together so that we can understand why each of us got different results when we thought that we were trying to measure the same thing". So, it's very, very important for your research. It is also important for your career. Being known for the work that you do means it is more likely when someone says, "Oh!, I'm looking for someone to hire - an expert to testify in this court case regarding this" - your name comes to their lips - because of it - (yes) you're the expert on this. Or because you're going to have a company that is going to say, "Yes! I want you to come and work for us because you know exactly what it is that we're trying to do, you have the expertise, you have the experience, come work for us" - hopefully, at a large salary or whatever.

Slide 52: What is the purpose of your writing, web page, blog, video, ... ?

So what is the purpose of your writing, producing web pages, blogs, videos, etc.? We need to think about: What is your goal? What do you want the outcome to be? Do you want visibility? Do you want citations? etc. So you need to think in terms of a synergy- as a strategy - it's the combined impact of all your communications that's going to matter. And that combined impact is much greater than the sum of the individual parts, so it is worth thinking very carefully about what is your overall strategy for publicizing what it is.

Slide 53: Who is your audience? Who are your audiences?

But if you think about that - that means you need to understand: Who is your audience? Who are you trying to influence? Or maybe there are some audiences that you're trying to influence. So I might be trying to influence my peers or my colleagues or potential contributors. People are going to put money into what I want to do or collaborate by jointly working with me or coming to work with me as a potential student. I might also be thinking

about a boss or an administrator or funding agency or foundation that I want to get money from. Or a private donor that I want to get money from.

In many cases, we might be concerned about the legislature - both for funding and for regulations. Is it an area I want more regulations. And if so, what should they be. Is it an area, I think the regulation should be relaxed in and why? What's the importance of my work with regard to those changes? First, you need to think about your friends and your enemies. And as they say, "your friends are happy to give you feedback, your enemies are going to give you feedback whether you want it or not", and, of course, in many settings, it is very important to be thinking of the general public. So as a university, one of our obligations and the so-called "tredje uppgiften" -the third assignment, is to communicate information to the public because the public is paying for the university - we want the public to be informed, and we want them to talk to their legislators, both to provide additional funding and to be able to say, "Oh! Yes, we believe that this should be done" or "no, we believe these sorts of things shouldn't be done".

Slide 54: When writing – always think of your audience

So when writing, you always need to think about your audience. You want to think about what you want to communicate about your research, and you want to explain your research, you want to engage your reader, you want them to be excited and interested, you want them to read more, you want to say, "Oh yeah! I'm waiting for the next paper to come out". You want to educate your readers. That means you have to provide the appropriate background so they can understand why it is that you've done it and why it's relevant and significant to them. Well, the last three of these are pretty hard when you have a lay audience- persons outside your immediate area. And, so it's very important that you don't assume that you're writing for one of your peers at all of the times. Many of my students have gone to work for a company located just across the street from me, and one of the problems is that most of the documents they find there are experts /written/ writing something for other experts. The result is there only a handful of people who can understand these documents - they have very little impact. So you need to think about how do you convey your results to people who are not experts in your field.

Slide 55: What does your audience already know? What do they want to know?

So that means you need to think about: What does your audience already know? And what do they want to know? Why do they want to know this? And so you're trying to find a balance between too much - giving them lots of information that they really don't need or giving them too little - so they don't have enough information to actually be able to understand what it is that you're trying to present. So, keep in mind your purposes and goals and what the audience needs to know.

Slide 56: What is the appropriate tone?

That means you need to choose the appropriate tone: is it formal, or is it informal? If the document is informal, then, of course, the tone should be informal; but for most of you, a very large portion of the documents you're going to write will be formal documents. That means you would need to avoid writing in the first person, you need to avoid contractions and slang, and you need to cite your sources in order to support your arguments. However, if you're writing for the popular press, you might not give all the details of all of your sources - you might give instead a list of sources in the back of your publication where the reader can go and find further information. So it doesn't look like an academic article, but (in fact) become much more readable for a larger popular audience.

Slide 57: Further resources

So further information can be found at <http://explainingresearch.com/> <http://researchexplainer.com/>, the website http://explainingresearch.com/working-with-pios_360.html working with public information officers - how do you get the information out to the people who are going to provide that PR for you - will all be good sources for you learning how do you manage to help publicize your work. So, one of the groups that you may need to interact with are journalists. So, learning how to communicate with journalists is very important.

Slide 58: Promoting ones work – communicating with journalists

And in Nancy Baron's book entitled "Escape from the Ivory Tower: A Guide to Making Your Science Matter", in the fourth section of the book, she entitles it "becoming an agent of change" you want to be proactive. Now, the particular focus of this book is environmental science, but this applies to lots of other areas. You want to be proactive, you want to be going to the press, you want to have your contacts that you can go to, and say "Hey! Here's this really interesting result. I think it's very important for society. Would you like to do an article about it? I'll help you get in contact with other people who can contribute."

Slide 59: Making problems open & giving prizes

In addition, we start to see another change that's taking place. There quite a lot of organizations that are saying, "this thing that I used to keep very, very confidential and proprietary - Why don't I make it available to other people - because they can help me.". So one of the efforts to do this is challenge.gov another is grand challenges in the global health sector. The whole idea is making it open - getting other sets of eyes looking at it, and perhaps providing you value that you wouldn't have been able to find. So, Adrienne Burke's article called "Science & Prizes: How open innovation networks can help solve scientific puzzles" - has looked at this phenomena of increasingly opening up the data that you used to keep secret.

Slide 60: Creative Common Licenses

Now one of the ways that people are opening up information so that others can use it is through Creative Commons licenses. And we can see here a range from the most open at the top to least open at the bottom - the different logos that are used. And so we see here the CCO public domain dedication that says, "I'm putting this in the public domain do whatever you want with it" to the next level down "attribution" "I'm making this available but if you use that I want to be cited" or "Share-Alike" - in this case, I want to be known for it - and I expect you if you use it to share it in the same way that I have with others. It is possible to say, "I want to be known for it but you can't make derivatives of it" or "I want to be known for doing it, but you can't use it for commercial purposes" or "you can use it for commercial purposes, and you have to share it", or the most restrictive and the least open in the Creative Commons licenses, "I want to be known for it you can't make money for it - you cannot have a commercial use, and you cannot create derivatives from it."

Slide 61: Conclusions

So, the conclusions of this module are: open, public, and official - is only getting more open - and more and more information is becoming available; therefore, it means privacy is becoming more circumscribed - so we have to be very careful about privacy, but it also means (yes) you have to work hard to make the things you want to keep private- stay private. And there are means, of course, that you can do that - but it's going to take work. But, of course, once information is public - it will probably not be forgotten - someone will have stored it somewhere. Now, Scott McNealy, when he was CEO of Sun Microsystems in nineteen ninety-nine, stated, "You Have Zero Privacy Anyway. Get Over It". And there are a lot of questions about: Is that really true? Will it become more or less true? And what choices can you make in your life they will realize that or perhaps prevent it? But in any case, if you wish to keep information private - you're going to have to work at it. And as professionals, you're going to have to make sure that you don't make information public that shouldn't be made public - but at the same time, you also want to make things as widely publicly available as possible - while still protecting personal privacy and integrity. So I wish you great success in getting yourself well known.

Slide 62: References

There are lots of references that you can read about it. Best of success in being known for what it is that you do and helping others build upon what it is that you've done.