

Online Privacy
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Privacy Nudges

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The slide features the NPTEL logo on the top left and the Indian Institute of Technology Hyderabad logo on the top right. The main title is "Lets study user behavior". Below it is a text box containing a quote: "The various strategies to protect people from phishing fall into three major categories: silently eliminating the threat, warning users about the threat, and training users not to fall for attacks. These categories of anti-phishing strategies mirror the three high-level approaches to usable security discussed in the literature: build systems that "just work" without requiring intervention on the part of users, make security intuitive and easy to use, and teach people how to perform security-critical functions [Cranor 2008].". Below the text box is a list of three categories: "Silently eliminate the threat / Regulation", "Warning / User interface solutions", and "Train the user". The first two categories are circled in red. A small video inset of Professor Ponnurangam Kumaraguru is visible on the right side of the slide.

Let us continue looking at the second part of the this week content that I was mentioning privacy nudges. It is a very important topic, because any technology, that you build any application, that you build, you are going to actually be actually providing it to the users, users are going to make some choices and how to, how well to build the interfaces, how well to build these nudges is an important question to actually think about. All of this falls under user behavior, studying user behavior.

So, one way to think about actually solutions, that you can build for users is actually this category I am sure there are other categories also that you can find. But this is one category, that was proposed in 2008, 2007. Which looks at first silently eliminating the threat, which is if you want to build any solution, for example email spam, just build a system, which is on the server and any email that comes the server detects that it is a spam or not and then sends it out. So, that is silently eliminating threat from the user point of view.

Equally regulation also have a regulation saying that anybody who any banks whose information gets breached, they have to do disclosure to the customers, send out an email, send out a letter

saying that the details were lost, or breached. In that case, the users are not even involved in the decision making, users are not in even involved in the process of the pipeline.

Second category of solutions is what mostly, that we look at as part of the nudges is this warning, or user interface solutions, I am sure you have used a lot of these solutions, which is any website that you go to, and there is a pop-up saying, that look this and this website is insecure do not go there. So, that is an interface solution, you can build a lot of these interface solutions.

And let us take you want to look at the ranking of a website, you go to a website and it actually provides you in the address bar saying look this is the ranking of this website, credibility of ranking of this website, across all the websites that are on the internet. There are many, many toolbars, that are available for doing many things, which are all actually the interface solutions.

The last one is train the users, if meaning I think in the last week, we talked about Facebook's content, that is there on their website about privacy, about educating users about how to share information, how to be more safe online, all of that, that is the train the user part. So, these are three kinds of ways, by which you can actually solve a problem, address a solution.

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Primarily in this category, we will actually look at warning, building, warning systems, or user interface solutions. What just take a second and think about what all online disclosures that we do? Disclosures here meaning let us take information sharing that we do. For example, I probably let us go over the list of that I probably may be doing list is, I share where I am at some

point I am giving a talk in this location, meeting this person here, meeting this alumni here, all of that information, that is my whereabouts that I am actually giving, probably with that I am also uploading my pictures.

So, that is also giving away my picture in the esports. I am sure you can think of pause for a second and think of all the disclosures, that you may be doing, not just the social media, you are also disclosing let us take your preferences on liking a page on Facebook, or going to a website and giving the browser history, also is probably the part of disclosure itself.

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Do we regret about any, have you regretted anything? So, the another way of asking this question is have you ever gone to Facebook and deleted a post, in the memories post that it shows up, 5 years before on this day, this is how this is what happened. And if you look at the picture, that it is showing and then you feel like nah, this picture really looks bad. So, let me just delete this post, or this is not something.

These kind of I mean you go look at your own profile and say that all these kind of posts I want to actually delete, remove all that. I am sure many of us have done it, I am sure I actually delete some post even immediately not necessarily after many years. Sometimes I actually delete my posts like in a short span of time, saying I do not want this post to be there, particularly in some platforms at least.

Have you regretted because of doing that post. There are also regrets, I am sure you have been tagged in pictures, which you do not want to be tagged, and which you do not want to show up on your profile, you probably want to remove that. Or you also disclose let us take from the earlier disclosure that I was speaking about, you disclose the location that you were and then people that you were in at some point in time, you do not want that information later to be available for somebody else.

I have had friends and students and relatives go through a lot of problems, because of these regrettable moments, that happens. And information gets shared on social media particularly. And then that comes backs and bites people.

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The image shows a presentation slide with a news article headline: "MI6 chief blows his cover as wife's Facebook account reveals family holidays, showbiz friends and links to David Irving". The article is by Jason Lewis and was last updated on July 5, 2009. The slide also features logos for NPTEL and the International Institute of Information Technology. A man in a red shirt is visible in the bottom right corner of the slide, likely the presenter.

There are many, many examples for regrettable actions, that has happened online. But here is one example that, that stands out for a lot of decision making at that point in time I guess. So, this was MI6, which is intelligence agency in UK the he was supposed to take the MI6 a chief role, but he did not take it, because the spouse posted some pictures on Facebook, which got public and the pictures that were posted were supposed to be not the pictures that he was people he were not supposed to be with, and that kind of got attention, and the chief job he could not take.

It is just one extreme, meaning I am sure you can think of relationships being broken, all relationships that you have on pictures, that you posted on Facebook shows up after your new relationship has started in the timeline that can be a problem.

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The slide features the NPTEL logo on the left and the International Institute of Information Technology logo on the right. The main text reads: "To help individuals avoid regrettable online disclosures". A presenter in a red shirt is visible in the bottom right corner of the slide frame.

Even your own friends list itself could be a problem in terms of these relationships. So, the goal is to help individuals avoid the regrettable moments, regrettable disclosures, that people do online, you want to avoid, you want to help users, avoid these kind of disclosures, that they make.

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The slide is titled "Motivation" and includes the NPTEL and International Institute of Information Technology logos. The text on the slide is as follows:

- Bounded rationality** (circled in red)
- Herbert Simon
- Biases / heuristics to affect online disclosure habits
- People losing jobs, relationships
- Behavioral economics
- Soft paternalistic interventions that nudge people
- Because of difficulty in configuring FB's policy, "context collapse" happens
- Sharing more than what they would like

A red bracket is drawn around the "Bounded rationality" and "Behavioral economics" sections. A presenter in a red shirt is visible in the bottom right corner of the slide frame.

So, here is some motivation for this problem of regrettable disclosures. Why you want to actually build technologies around it? If you are aware of Herbert Simon's work, so this is a work, that got him Nobel Prize. So, which is called Bounded rationality, people make choices even though

sometimes you can think, that people are irrational in the choices, that they are making. Almost all decisions choices, that people make is actually bounded by a region.

So, to say the decisions that PK would make is always bounded, set of choices that I will make is always bounded. For example, the set of kurtas, that I wear is probably always certain types, that is just one type of choices that I am making. But I am sure you can think of all other choices, that we make are always from a bounded set of choices, that we have, it is not like completely rational I make choices which are very, very different from what I have been making until now.

Biases heuristics even the heuristics is the choices, that we make online disclosures. For example there have been cases in the past, where people have posted about some political activities, politicians have gotten into trouble, that is part of a moment you think of actually doing something, saying something online, which comes back and bit you.

I have also seen people not getting jobs, because of actually the post, that they have done at some point in time. Somebody complained about a laptop, somebody complained about operating system at some point in time and when the interview was done, of course all companies today are actually looking at profiles giving a sense of when there are even companies, I mean this verification process has been old set of companies, old activity anytime you want to get a job, they do background check all of that.

But now, today companies are actually using those social services, social media posts, that you do also for analyzing who you are and what you are, I am sure some of you would have known recently even the US embassy in their application started asking for I think social media handles. In 2019 elections in India, the politicians when they filed the affidavit for contesting the elections had to actually fill out the social media details. So, the social media information is actually useful for making all these choices now.

So, behavioral economics is where the idea of this whole nudges and everything is coming. The small intervention to a user behavior can actually change the user behavior, I am sure for a second if you think about it, the not just that we get, when we were kid we used to play let us take with firecrackers, somebody comes and gives you a nudge saying look you are going to burn your finger, you are going to burn your relatives, or neighbors home, or all that. Some kind

of a nudge would actually help, I has been shown that it helps in making choices, changing the behavior actually what is changing behavior is the choices that we make.

So, context collapses are actually also a big concern. I earlier talked about us having multiple accounts in the same platform, that is also because you do not want to have this context collapse, you want to talk to for example in my case I want to talk to only the to polarity Hyderabad students for a post that I do, or I want to talk to send it only to her my relatives my friends from CMU.

The contexts are very different and context collapses happen context collapse the idea is that, I do a post and I was trying to do it for this particular context, but the post is actually showing up for everyone, where the context collapse is happening, that is the idea for context collapse.

So, that is these are the set of motivations, why you want to have some kind of a nudge, I am meaning these motivations are not necessarily for only privacy nudge, because I think all of this could be explained for any kind of nudge just that you could build, online particularly, I am going to use it only for the privacy nudge.

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What are nudges? I just gave you some examples of nudges, a pop-up showing, that you really want to go to the website, it is actually insecure, your parents stopping you from doing something.

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Nudges

Subtle yet persuasive cues (e.g. defaults)
B J Fogg, Stanford

Creates choice architecture

Encourages wanted behaviour and inhibits unwanted behaviour

Organizations / Governments use nudge techniques in many ways

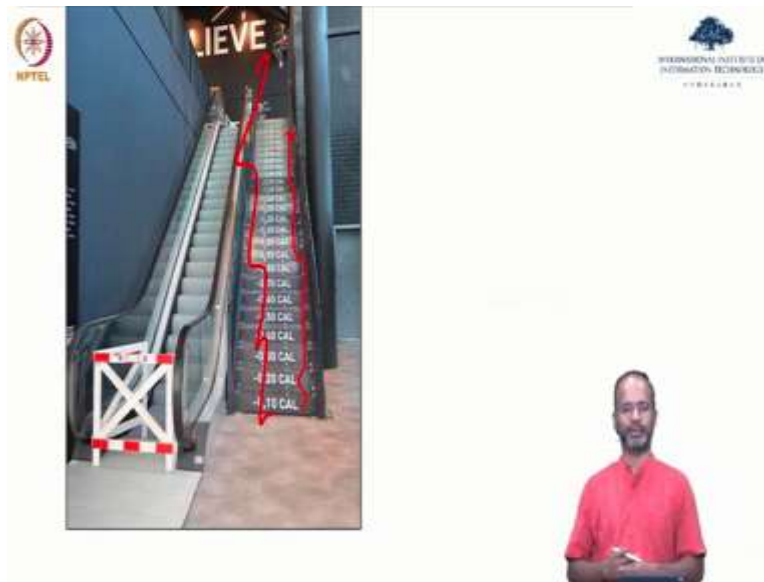
There is been a lot of work on nudges, here is a book about nudge, this professor from Stanford B J Fogg, has been doing a lot of this work around persuasive technologies, how to change user behavior, see technology has changed fast, technologies change extremely fast and particularly in the last decade, or two decades, the changes in technology has been phenomenal. But user behavior takes a little time.

So, that is where the crux of the problem is how do you get the user behavior to do right things I think we have also, I had also written it here, encourages wanted behavior and inhibits unwanted behavior, you also want the behavioral change in the direction.

So, nudges also helps you to create choice architecture. First I want to do this, next I want to do this, those kind of for example conversation that I have been having about recently on application for grad school, choice architecture, you want to decide on which school do you want to go to for the application, where to apply, which professor to work with, which department to work with.

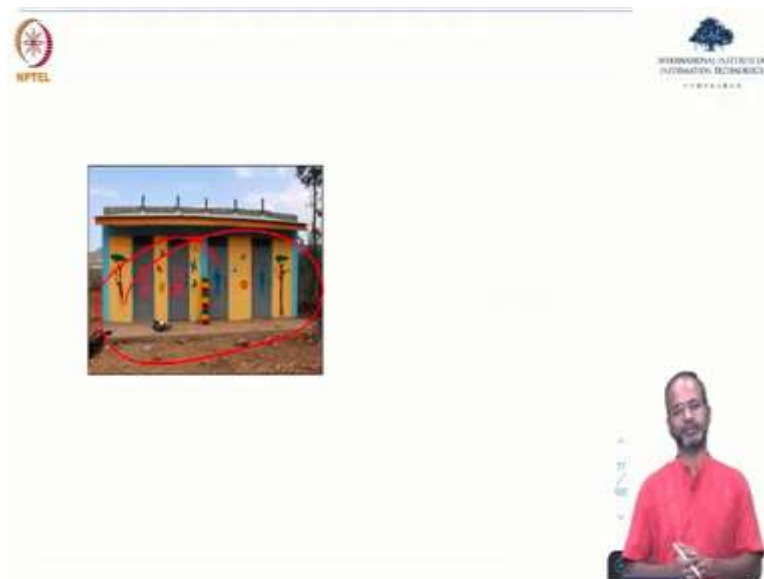
So, these are all choices again and there is an architecture in which and so similarly you can I mean even in the admissions process itself, you can think of some nudges. Somebody giving you an input of saying how to write an sop, which school to apply, why should you apply to this school, versus the other school. Nudges are phenomenally around all context, where the nudges help actually make choices.

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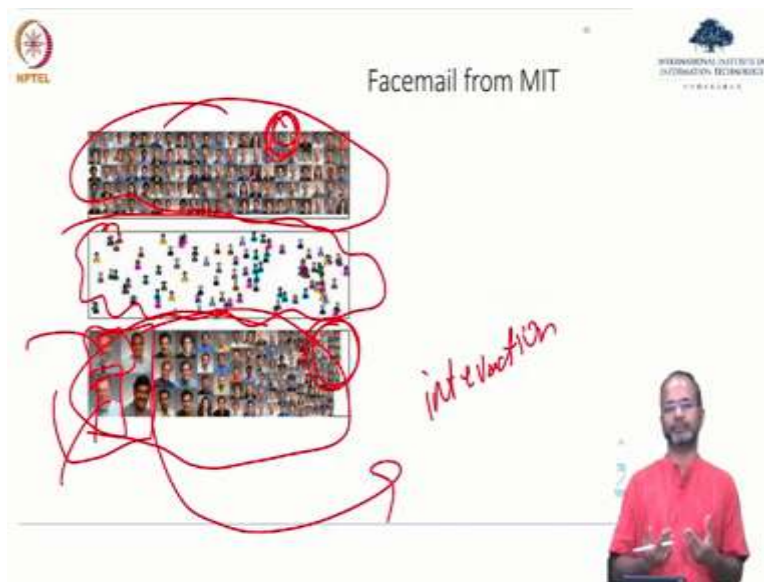
Let us look at some examples not from the online world, these examples are so if you look at this it is actually giving you the calories for taking the steps, small nudge, saying here is a calorie that you can actually burn, if you take steps.

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And then in this case, again a nudge for using the restrooms, which can probably attract people to use the restrooms properly.

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Here is another one, that is (())(15:05) online. This is Facemail from MIT, I am sure some of you may have been in this situation, but you may have heard about this situation, where people send out emails, when they wanted to only reply to a particular email, they will actually reply all where it where the email ends up going to the entire mailing list than just this sender whom he or she wanted to send the email to.

It is a common problem meaning if you are part of mailing list, you will realize that you got some emails from somebody who wanted to only reply to the sender. This is the problem that they were trying to attack they built like three different solutions, which is the first one is saying who all are on the mailing list. The second one the same profile information, but presented in a non- profile pictures. The third one is actually slightly interesting where they used the number of interactions, that you have with the particular person to increase the size of the profile picture.

So, which is this person interactions, the sender has more interactions with these four people compared to this person. How does that help? Again, all of these three helps in decisions that you can make. Now, when you are sending the email, look I was going to only send it to PK, but it looks like it is showing there is so many profile pictures, it is it means that I am sending it so many people.

So, I should actually look at where am I ending the email to, all the three could be used for that. The third one helps you to think about who are you sending this email, are you sending the email to somebody whom you are interacting with more or less.

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So, in the context of privacy nudge, let us look at three nudges, that were built and some evaluations done around it. So, we will actually look at what are the nudges? How to do evaluation? What evaluation was done? Which one worked better? The first one is called privacy nudge, sorry picture nudge, everything is a privacy nudge here, picture nudge.

So, this is a Facebook post, a Facebook browser plugin, which extension, which actually helps to tell you like this is the public post, if you are going to do it on your if you were going to do that post, this is an extra information, that the extension is showing you, which is these people and anyone on the internet can see your post, because it is actually public.

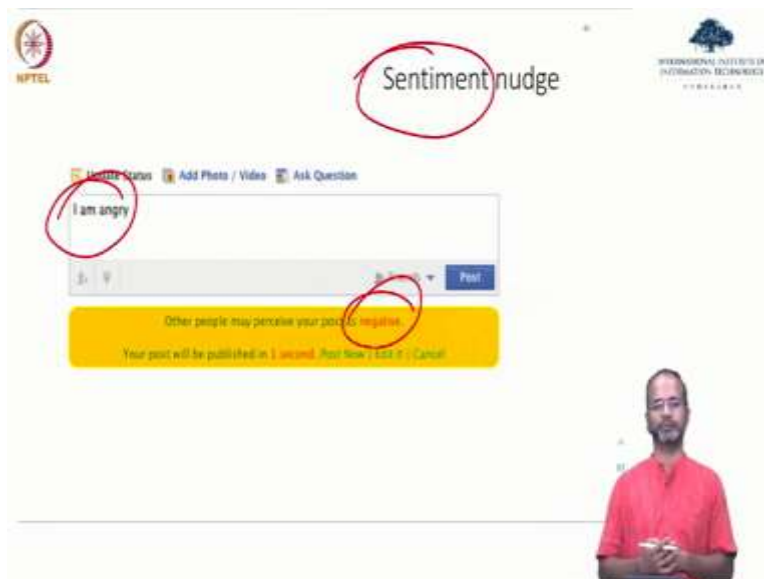
So, this is the picture nudge and it is also using the MIT Facemail idea, which is to show the profile pictures of people who would actually get the post, if and when you do the post, that is the picture nudge.

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Next is timer nudge, where the same post when you are trying to do, it is actually giving you will have 10 seconds to cancel after the post was done. And your post will be published in so many seconds. Many of the mail service today has this feature, that when you send an email you get like 10 seconds a few seconds, that you can go and undo the post. And in this case, it is also allowing you to give 10 seconds and if you want to post it right now just do the post, their post now. This is timer nudge.

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The last nudge is sentiment nudge, which is again this the moment that you want to share that information, that other people may perceive your post as negative. So, do you really want to send it, that is where this nudge helps, which is to provide that feedback saying something, that you are typing is probably negative, do you still want to post it.

Again, giving some examples from the past, there have been situations, where users have posted something and then got into trouble even to the extent of getting arrested, getting into a lot of trouble, because of the post that they did. Can you stop them from doing that? Or at least tell them, that they may get into trouble, if they do this post.

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The slide is titled "Methodology" and features the NPTEL logo on the left and the International Institute of Information Technology logo on the right. The main content is a bulleted list of methodology details. In the bottom right corner, there is a small video inset showing a man in a red shirt speaking.

- Chrome browser
- Exit survey, follow-up interviews
- IRB approved
- Recruitment
 - Craigslist, flyers, emails, etc.
- 21 participants who completed the field study and 13 participated in the interviews

Methodology, so what did they do with this? They created this nudges what did they do with this nudge, it is a chrome browser, extension users were asked to use this extension for a period of time and survey was done from their post study, post exit survey was done from them, asking them to fill some questions and the users were recruited through craigslist flyers, emails, today you can do social media all of that.

21 participants who completed the field study and 13 participant participated in the interview, which is they did the study and then they also spoke to them saying, oh how did you, did you know that this extension was there? Did this extension help you to make these choices better, all of that.

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NPTEL

Methodology

- Control stage
 - Data collection
 - Survey
- Treatment stage
 - Data collection
 - One nudge
- Final survey
- Follow-up interviews

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Later part of this, later part of the course we will actually look at we will take up this ethics studying privacy as part of ethics itself, to see how to do some of these studies, wait how do you draw the line of what information to collect and what information not to collect. But for now just think of it as a lab study, somebody is using this extension you are getting them to use the extension, keep track of what they are doing.

And then, when they got into the study, you collected some information, when they finished the study you got them to do some interviews and fill the form. So, that you can actually make some judgment on how the extension worked, how the nudges work. So, two categories, because I think you want to have always have this control group is to show that look without the extension how people would behave.

And then, in the treatment you have one nudge presented again multiple interesting studies could be done, whether if you were to present them with multiple nudges. But, this study actually talked about only one nudge. If I show you this particular nudge, let us take timer nudge, for a period of time does your user behavior change.

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The slide is titled "Evaluation" and features the NPTEL logo on the left and the logo of the International Institute of Information Technology on the right. A list of four evaluation metrics is displayed in the center:

- Number of changes in inline privacy settings
- Number of cancelled or edited posts
- Posts frequency
- Topic sensitivity

A red hand-drawn bracket groups the last three items: "Number of cancelled or edited posts", "Posts frequency", and "Topic sensitivity". A presenter in a red shirt is visible in the bottom right corner of the slide.

So, you also want to make sure that the evaluation is good, again later we will look at user studies evaluation everything. But for now evaluations are ways by which you find out in this case number of changes in the privacy settings, the nudge is showing, let me just go change my privacy setting, or let me not do the post, number of cancelled, or edited post, or let me change the because the sentiment is saying negative, let me change the content in the post itself.

Post frequency, meaning earlier I mean in the control group people are posting 35 posts per a month, whereas in the extension, or in the experimental setup, they are only posting let us take 10, is it because of the nudge. Topic sensitivity, understanding that what topic are they posting. So, that is the evaluation metric, you can think of other evaluation metrics also, but this one these four helps in these four is what the users actually did. The administrators for the study did to collect information.

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ID	Sex	Age	Days in Control	Days in Treatment	Nudges Shown	Posts in Control	Posts in Treatment
P-1	F	29	11	12	4	8	21
P-2	F	27	10	11	6	6	6
P-3	F	26	12	13	5	10	10
P-4	M	25	14	15	7	12	15
P-5	F	28	13	14	8	14	18
P-6	M	24	11	12	5	9	11
P-7	F	27	12	13	6	11	14
P-8	M	26	10	11	4	7	9
P-9	F	28	11	12	5	8	10
P-10	M	25	12	13	6	9	11
P-11	F	27	13	14	7	10	12
P-12	M	26	11	12	5	8	10
P-13	F	28	12	13	6	9	11
P-14	M	25	13	14	7	10	12
P-15	F	27	11	12	5	8	10
P-16	M	26	12	13	6	9	11
P-17	F	28	13	14	7	10	12
P-18	M	25	11	12	5	8	10
P-19	F	27	12	13	6	9	11
P-20	M	26	13	14	7	10	12
P-21	F	28	11	12	5	8	10
P-22	M	25	12	13	6	9	11
P-23	F	27	13	14	7	10	12
P-24	M	26	11	12	5	8	10
P-25	F	28	12	13	6	9	11
P-26	M	25	13	14	7	10	12
P-27	F	27	11	12	5	8	10
P-28	M	26	12	13	6	9	11
P-29	F	28	13	14	7	10	12
P-30	M	25	11	12	5	8	10
P-31	F	27	12	13	6	9	11
P-32	M	26	13	14	7	10	12
P-33	F	28	11	12	5	8	10
P-34	M	25	12	13	6	9	11
P-35	F	27	13	14	7	10	12
P-36	M	26	11	12	5	8	10
P-37	F	28	12	13	6	9	11
P-38	M	25	13	14	7	10	12
P-39	F	27	11	12	5	8	10
P-40	M	26	12	13	6	9	11
P-41	F	28	13	14	7	10	12
P-42	M	25	11	12	5	8	10
P-43	F	27	12	13	6	9	11
P-44	M	26	13	14	7	10	12
P-45	F	28	11	12	5	8	10
P-46	M	25	12	13	6	9	11
P-47	F	27	13	14	7	10	12
P-48	M	26	11	12	5	8	10
P-49	F	28	12	13	6	9	11
P-50	M	25	13	14	7	10	12

So, one way to represent the data is this, which is all the participants here and gender, age, days in the control, nudges shown, posts in the control, posts in the treatment. So, this is days in the control, how many days were they in the control group? How many nudges did they get to see? Nudges shown is here, nudges that they saw, posts in control, number of force that they did in the control setting, posts in the treatment, total number of posts that they did when they were nudges were shown.

So, if you look at participant 1 female 29 years number of days in the control and days in the treatment, 11 days in the control and 12 days in the treatment, number of nudges shown within this 12 days of treatment, 4 nudges were shown to the user, number of force the user was trying to do 8 posts in the control time, which is in the 11 days, 18 posts person the treatment is 21. So, you can see how users change their behavior.

And then in this one, because this is sentiment, this is also showing you positive, negative, how many posts were positive, for example if you were to read this this one it says 23 posts were in positive and 10 posts were in negative. Identified when the user was trying to type, it was identified that 10 posts were negative. So, that helps to get a sense of the entire study all the data I mean actually all the data that they may have collected is probably in this one table.

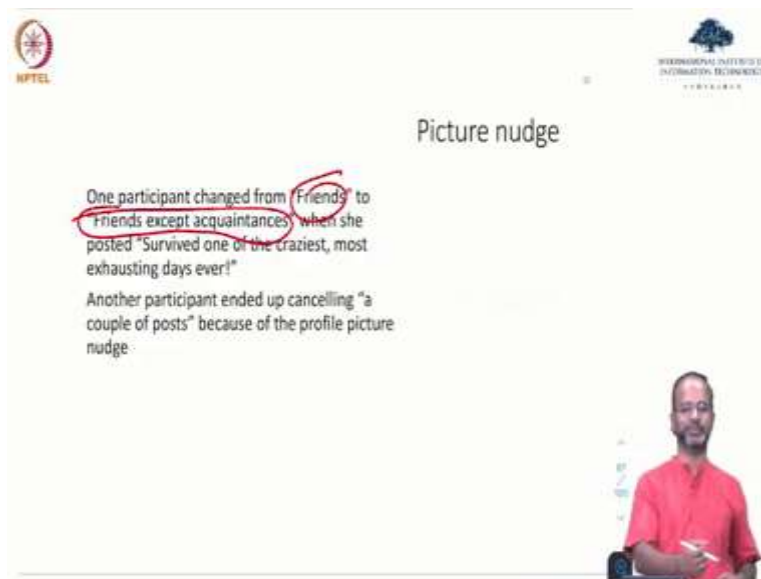
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The slide features the NPTEL logo on the left and the International Institute of Information Technology, Hyderabad logo on the right. The title 'Results' is centered at the top. Below the title, two lines of text are listed: 'Some participants just forgot about the plugin' and 'Some participants remembered about the plugin'. A small number '30' is visible in the top right corner of the slide area. A presenter in a red shirt is positioned in the bottom right corner of the frame.

Some results that they drew, some participants just forgot about the plugin and that is the kind of behavior you really want, because once the users are immersed in their behavior and you are able to collect data about the user behavior, that you want, I think that is the best thing that you can get. Some participants remember the plugin.

So, therefore what happens is? The plugin is there and then there is a chance that they are behaving, because it is not a natural behavior, because they know that they are part of the study and they are actually know that the plugin is there. So, the behavior kind of changes. This phenomenon is very well known, which is even if there is the administrator who is supposedly doing the study conducting the studies around, the user behavior is very different, when they when you remove the administrator from the study physically.

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The slide features the NPTEL logo on the top left and the International Institute of Information Technology Hyderabad logo on the top right. The title 'Picture nudge' is centered at the top. The main text on the slide is as follows:

One participant changed from Friends to Friends except acquaintances when she posted "Survived one of the craziest, most exhausting days ever!"

Another participant ended up cancelling "a couple of posts" because of the profile picture nudge.

A presenter in a red shirt is visible in the bottom right corner of the slide.

So, here are some outcomes from each of the nudges, some one participant changed from friends to friends except acquaintances, when she posted survived one of the craziest most exhausting days ever. It just shows that, the user is actually controlling, sending that information to a less set of people. Another participant ended up cancelling a couple of posts, because of the profile picture nudge, I mean this the Facemail effect and showing that who is sending out I really do not want this user to see.

This is also please keep in mind these nudges are also designed for people, users who have these kind of content, that they generate, which is for different sets of people, for example people like me I do not even look at any of these, I make all posts public, my profile is public, all posts are public. So, therefore, it is for the people who it is for the set of users who want to have the content generated for sets, for example family, friends, CMU friends, typically Delhi friends, typically Hyderabad students, all of that. I used to do all of this like for 7-8, years before, but now I made now I my choice are everything is public.

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The slide features the NPTEL logo on the left and the International Institute of Information Technology logo on the right. The title 'Timer nudge' is centered at the top. The main text reads: 'One participant mentioned "at times annoying and at time handy"', 'Wait for timer to expire or hit "post now"', 'Make it more public when it was "venting" type', 'Another participant said, made me think about the posts', and 'Cancelled a few because of thinking'. A presenter in a red shirt is visible at the bottom right of the slide.

A timer nudge, one participant mentioned at times annoying and at times handy. So, definitely I mean you have to wait for 10 seconds in case, if you want to do the post immediately, you have to go click again that post now button, wait for timer to expire, or hit post now, make it more public, when it was mentioned type. So, it is kind of again user behavior change.

Now, the participant said made me think about the post cancelled a few posts, because of thinking, which is what the administrators of the study really want.

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The slide features the NPTEL logo on the left and the International Institute of Information Technology logo on the right. The title 'Sentiment nudge' is centered at the top. The main text reads: 'Nudge was missing the context', 'Error in finding the sentiment', 'Many participants cancelled their posts because of the nudge', and 'Post frequency reduced for sensitive information, 13 → 7'. Handwritten red notes include 'Happy to give the 5', 'Going to meet x day', and 'Dinami Maza ayege!'. A presenter in a red shirt is visible at the bottom right of the slide.

Sentiment study, nudge was missing the context. So, this one is more nothing to do with privacy, but this is more of the general national language processing area itself. It is extremely hard to find the positive and negative sentiment of the post, to be precise actually there is a lot of a lot of content, that we generate particularly even if you think about it, you must be generating a lot of code mix data also, not necessarily only happy, to give this lecture, this could be one of the posts, or it could be like going to meet x during Diwali, maza ayega.

So, now the context of, so what is the sentiment that I can get out of this? So, it is very hard to find the sentiment and that is the problem, that is highlighted here. Many participants cancel their post, because the nudge, because of the nudge. Post frequency reduced for sensitive information from 13 to 7.

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The slide features the NPTEL logo on the left and the International Institute of Information Technology logo on the right. The main title is 'Technical complaints'. Below the title, two bullet points are listed: 'Facebook page lag' and 'Posts not getting through or delayed posting'. A presenter in a red shirt is visible in the bottom right corner of the slide.

Some technical glitches I think I wanted to highlight these things, just for you to have in mind, if and when you do these kind of studies, you want to make sure that you avoid some of them, because it was an extension at that point in time and it was making a request to Facebook and do all of these analysis. There was a lag and post not getting through, or delayed posting. Because of the, because of the way that they must have set up the browser extension, it was getting delayed, it was taking some time all of that.

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NPTEL

Exit survey

"Had time to think about what I posted and whether or not I really wanted to be represented in that way"

Participants had a positive perception about the timers

Slack
gmail
microsoft

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDRABAD

Exit service super critical is because you wanted to if one of the important key factor for an exit survey is, that you want the users to know what you did in the study, what were you trying to study and tell them that this is the reason why we collected this information all of that. I had time to think about, what I posted and whether or not I really wanted to be represented in that way.

So, the nudges is kind of nudging the user saying do you really want to do this post. Participants had a positive perception about the timers, I mean I think this timer thing was not there in many of the email services, let us take even couple of years, today I see not just mail I see that in slack, I see that in Gmail, I see that in Microsoft, every everywhere you can see this so do not post now post it later, or post now and then in few seconds you get a chance to do undo the email also.

I probably have done that so many times, because you send the email to somebody, which you did not intend to, most of the times in this reply all, reply, or you forget somebody to copy you wanted to copy this email in addition to whoever is marked in the email and you kind of send it. So, these kind of situations help, that undo button helps you to avoid these things.

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Takeaways & Limitations

Stop & think
Content feedback
Pay attention to the audience

Missing other browsers
Biases in results because of Chrome browser

APWG

What are the general takeaways from these nudges? Study, stop and think. There was a APWG also started doing this idea of stop and think before you go to a website, before you click on a link, the campaigning around stop and think is also something what is going on. Content feedback you are getting feedback from the system for the post that you are doing, pay attention to the audience, while designing these kind of solutions, pay attention to who is the user, who you are designing it for.

The limitations are this was done only as a chrome browser extension. So, if you are using let us take brave now, or if you are using safari now, this would not work. And then if you are on Facebook, or anything none of these nudges would work. Biases in results because of chrome browser, the results may have been biased, because of the kind of users that are there who use only chrome.

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The slide features the NPTEL logo on the top left and the Indian Institute of Information Technology Kharagpur logo on the top right. The main content is a document titled "Privacy Nudges for Social Media: An Exploratory Facebook Study" by Yang Wang, Pedro Clemente-Laura, Nishu Goel, Shantanu Chatterjee, Alessandro Acquisti, and Liane Hash-Cohen. The authors are affiliated with Toronto University, Carleton University, and the University of Pittsburgh. The abstract discusses how nudges can be used to help users make better privacy decisions on social media. A red circle is drawn around the title of the document.

I would be curious to know how many of you use what are the browsers, that all of you use, post it in the mailing list, if there is anything other than safari brave, these browsers post it and then we can see, if there is any interesting diversity of browsers, that we all of us use. This is the paper, this is the paper that I have been speaking until now, which is privacy nudges.

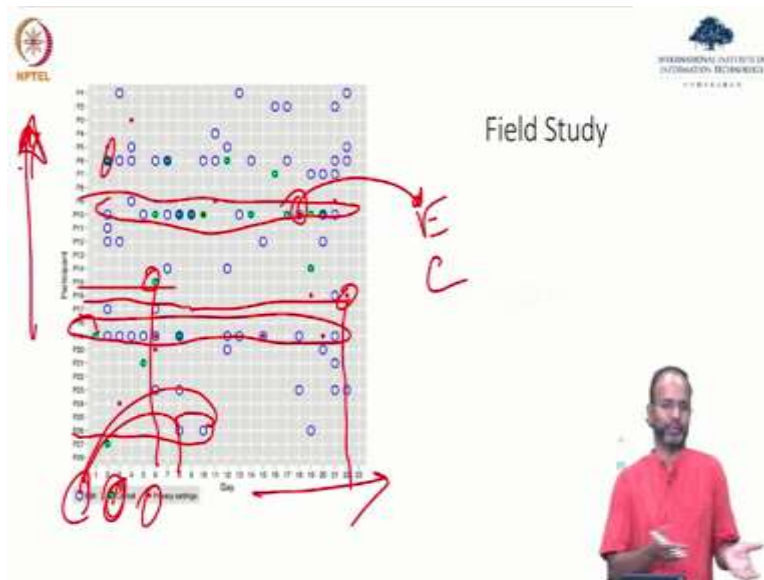
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The slide features the NPTEL logo on the top left and the Indian Institute of Information Technology Kharagpur logo on the top right. The main content is a document titled "A Field Trial of Privacy Nudges for Facebook" by Yang Wang, Pedro Clemente-Laura, Alessandro Acquisti, Liane Hash-Cohen, Shantanu Chatterjee, and Thomas H. Davenport. The authors are affiliated with Toronto University, Carleton University, and the University of Pittsburgh. The abstract discusses a field trial of privacy nudges on Facebook. A red circle is drawn around the title of the document.

And they actually went and did a field trial also, not just only the lab study that I just now mentioned, but actually looking at taking it to the real world and trying to see how they can

actually deploy it. I am not going to go through this in detail, but this is the paper, feel free to take a look at it.

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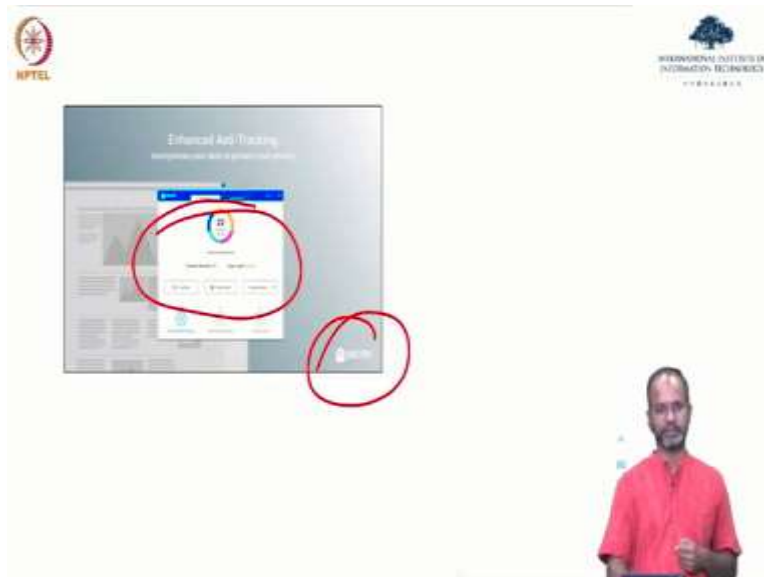
Only one graph from that paper again, one graph to tell many things that has happened in the study will help. This is the results, let us go through what the graph is. So, this one is a day 23 days, this one is a participant, three things that they are highlighting, one is the edit, cancel, and privacy settings, which is a post that I was trying to do I edited the post, because not showed up, I cancelled the post. And I actually went back and changed my privacy settings, or actually did something in the privacy setting.

So, let us take some users, this is user 26, on day 8, edited the post on day 10, again edited the post. This one, let us take this is user 15, on user 15, on day 6 cancel the post. Let us take some only red here 22 day, participant 16, just went and changed the privacy setting. I am sure you can go through it well.

Some more interesting ones are these, which have to sort of say action, in this case, in this case if you see days 18 participant 10 did both editing the post and canceling the post. And it looks like participant 10 was super active, if you look at all the actions. And similarly participant 19. So, which is multiple actions done on the same day, because they were, because of the extension they could actually look at all the users, what all action they are doing and that was captured. And therefore they could draw this graph.

Just to show that people are actually changing their behavior and having a control group helps to argue that look, without the nudges people were not doing anything, any edits, any cancellations, or any privacy setting view.

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So, I wanted to show two examples now which is helping these kind of privacy, information, nudges, all of that. This is ghost tree. So, using anonymize, so to say protection of your data while doing some things online, randomized perturbation of the idea. Again, we will spend a lot of time in details about anonymization later. But this connects to again this nudges that you can provide for the users to make better choices. If you are just even here that is also a nudge.

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Here is a more interesting nudge from light beam. So, this is actually showing you the details of what are the sites that you are connected to in a network graph. And then you can roll into details about, which site you are giving what information all of that again context of privacy, these are privacy tools, ghost tree and light beam, helps to understand how your data is being shared and in the context of nudges it is also providing you information about interactions that you have.

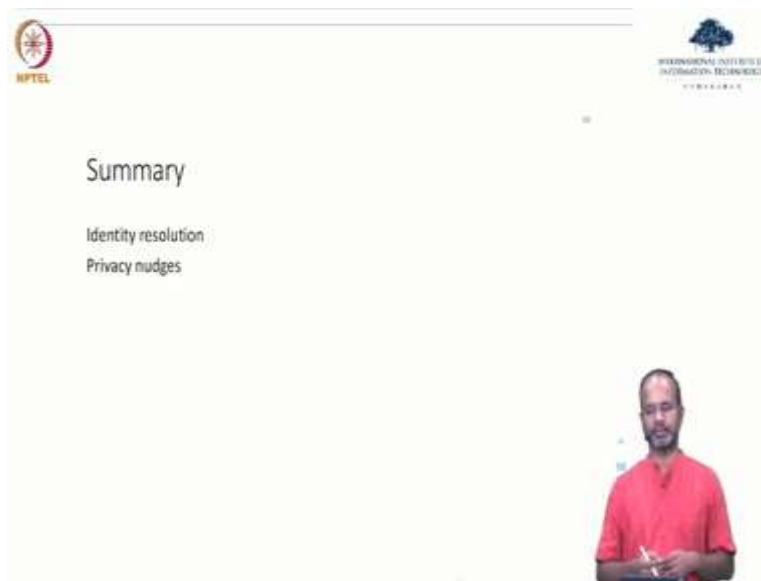
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Activity for this week, this part I think the even the first part I gave you an activity. This part is find instances of this regrettable disclosures, think about it, look for regrets, that have happened

that are publicly available, news articles, post all that. If you were to think about more ways to nudge users about privacy, what and how would it be?

What do I want you to submit? Submit is in the mailing list, so to say is instances of regrettable disclosures, that you find, when you like the MI example that I gave are there other examples, that you can find, where these information posted online has actually come back and burned some users.

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Summary for this week is the first part of the week, first part of the content that we saw, we saw identity resolution. And now we saw privacy nudges. The second part we saw is privacy nudges. These are two important and very interesting topics in privacy. So, take a look at the content, if you have any questions, again feel free to add it to the mailing list, we will be happy to answer the questions and take it forward. Thanks again for listening to this lecture.