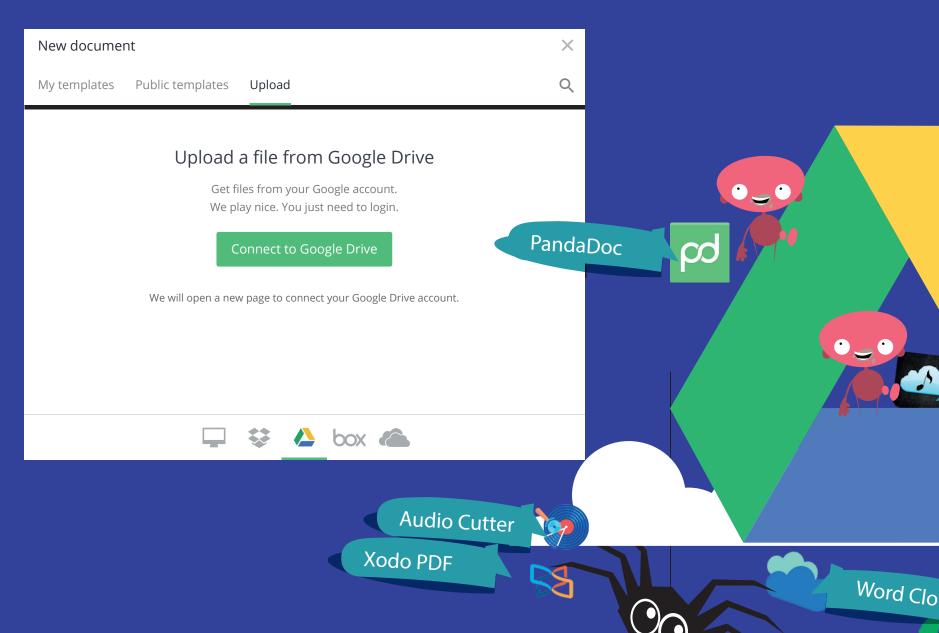
If You Can't Beat Them, Join Them: A Usability Approach to Interdependent Privacy in Cloud Apps

Cloud Apps are the new Desktop apps



Organizations use 10-20 times more cloud apps than their IT departments think.



average financial impact on a company as a result of a cloud-storage data breach

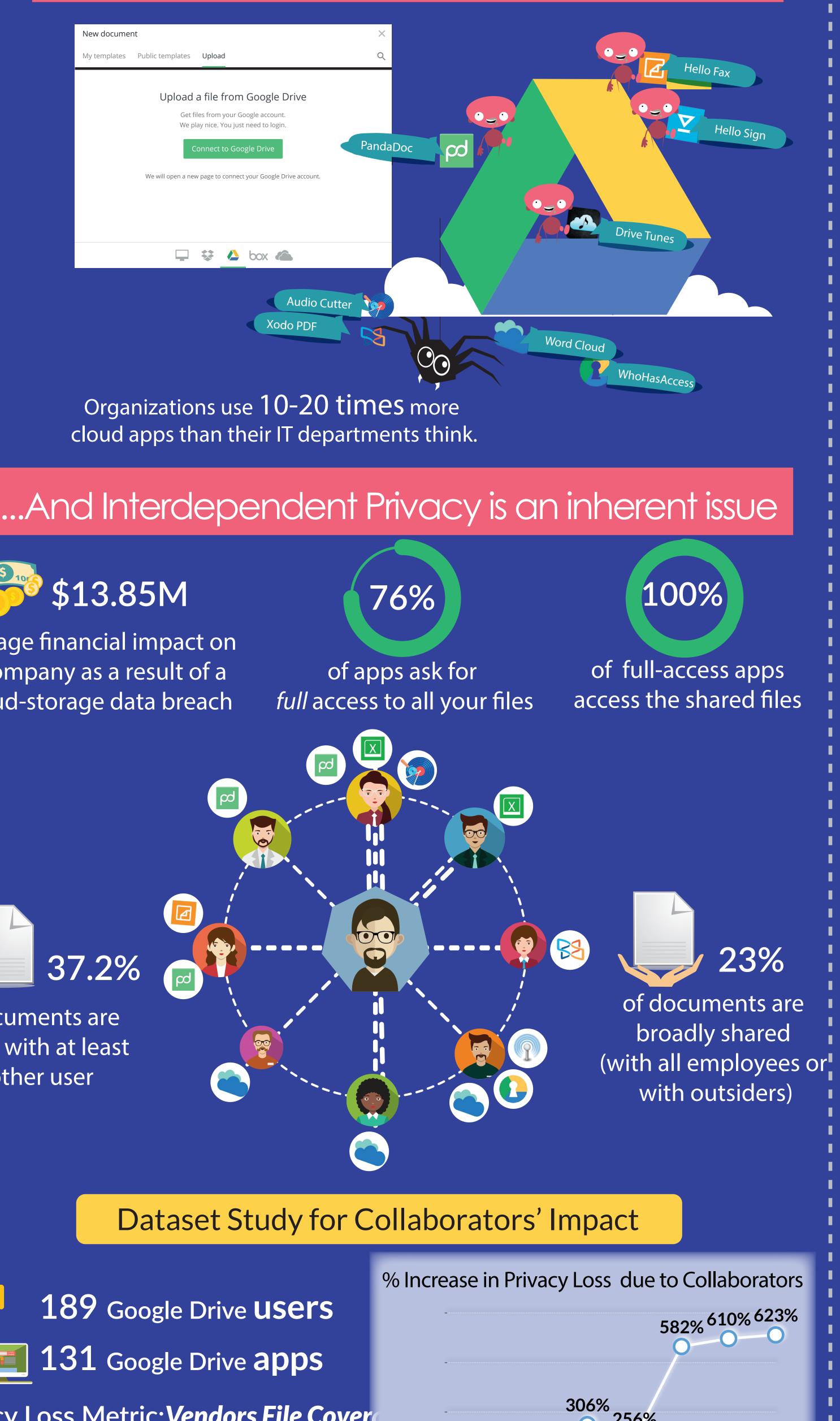
of documents are

shared with at least

1 other user



of apps ask for

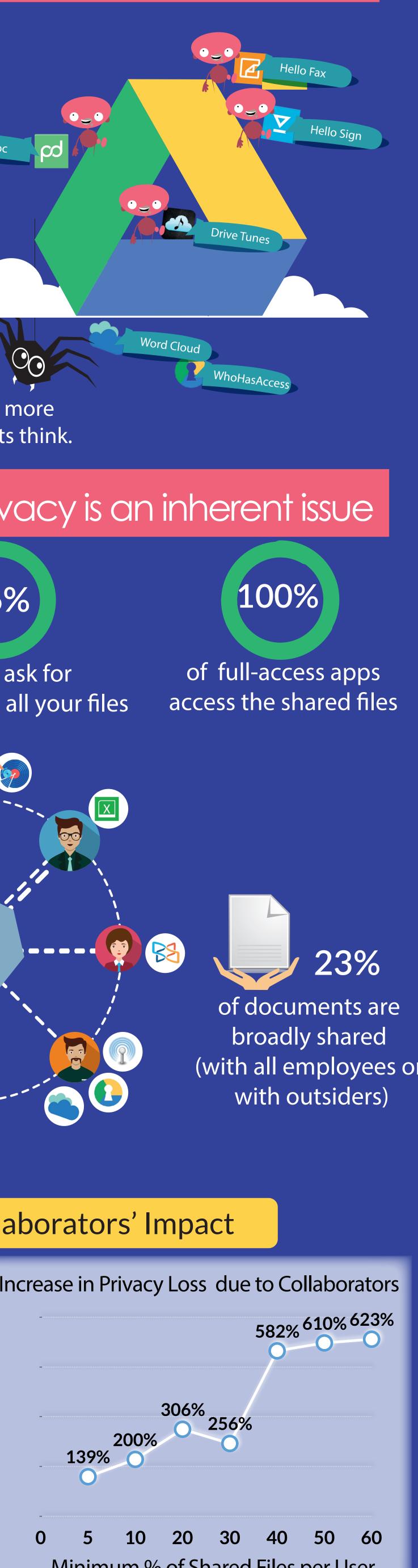


189 Google Drive USERS 131 Google Drive apps

Privacy Loss Metric: Vendors File Cover

 $VFC_u(V) = \sum_{v \in V} \frac{F_{u,v}}{F_u}$ $Self-VFC_u = VFC_u(V_u)$

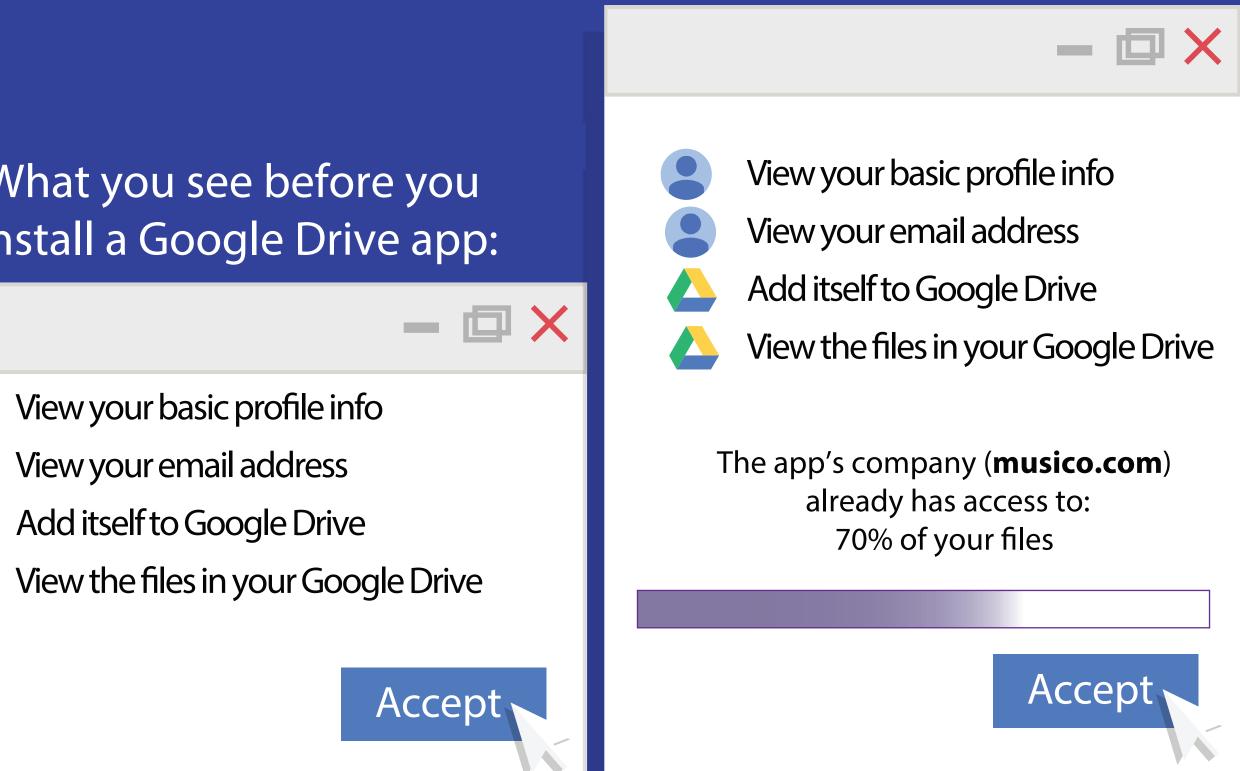
 $Collaborators-VFC_u = VFC_u(V_{C(u)})$



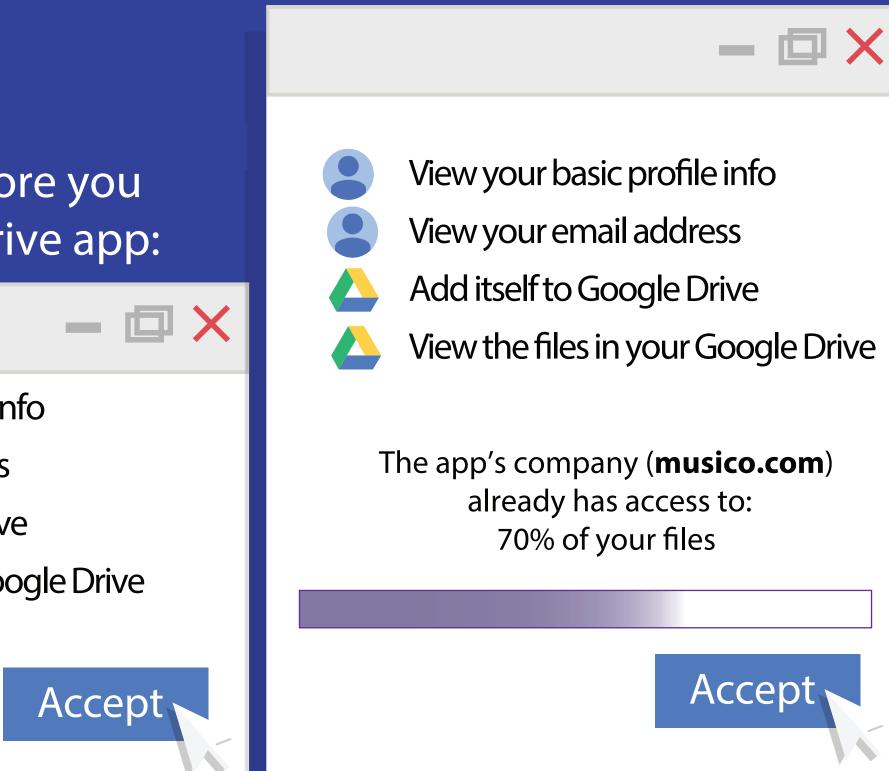
...But Usable Privacy Can Help Mitigate This

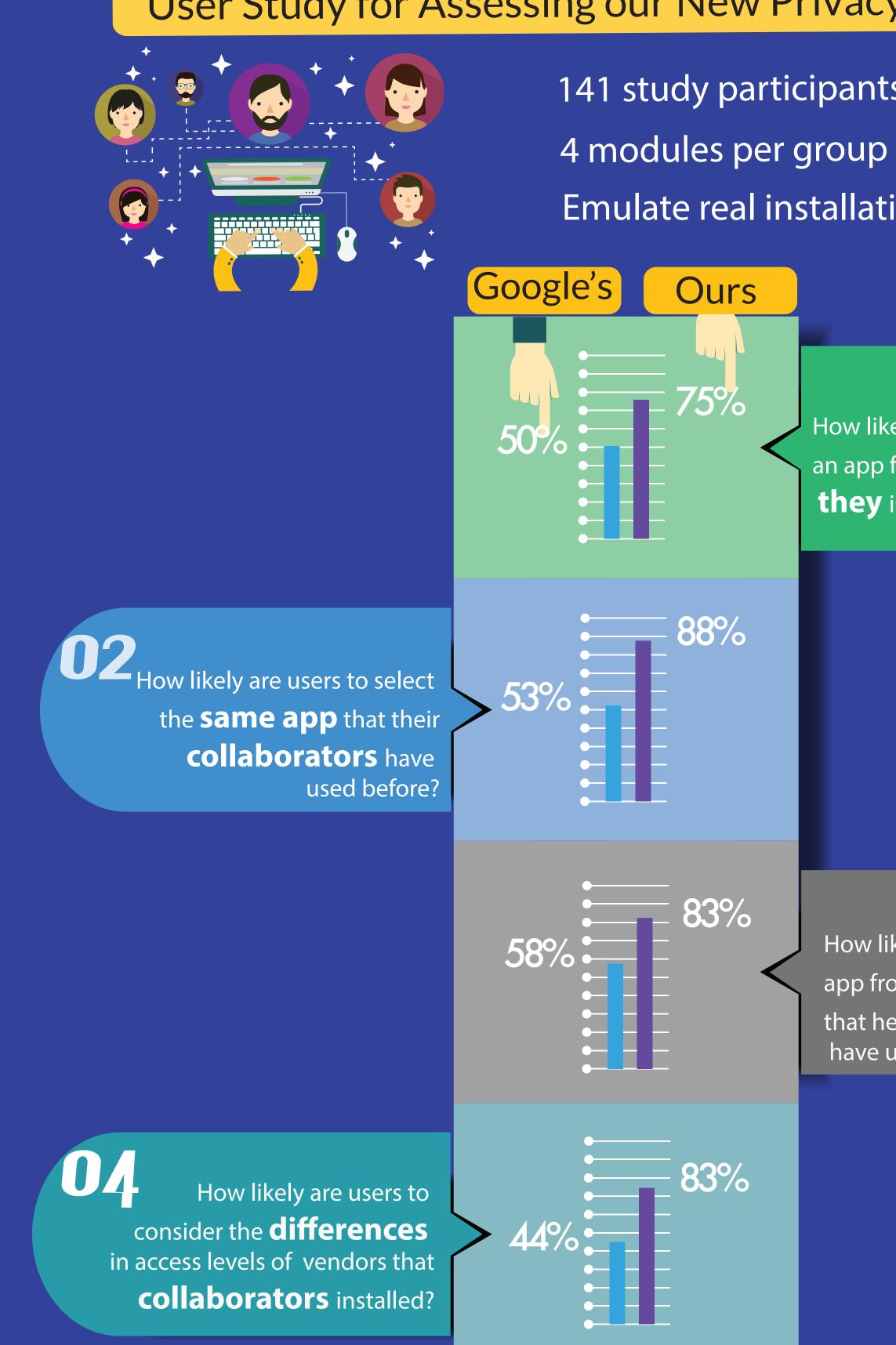
Minimum % of Shared Files per User

What you see before you install a Google Drive app:



- View your basic profile info
- View your email address
- View the files in your Google Drive







How we can relay the problem of interdependence:

User Study for Assessing our New Privacy Indicator

141 study participants in 2 groups Emulate real installation tasks

> How likely are users to select an app from the **same vendor** they installed from before?

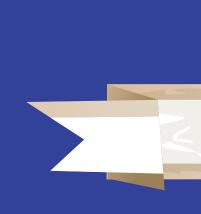
03 How likely are users to select an app from the **same vendor** that her **collaborators** have used before?

With Scale, Interface Changes Pay Off

Simulations with Large Individual and Team Networks Connected graph with 18,000 users and 138,000 edges, with a similar distribution Network to our real Google Drive dataset Real-world graph with 41,000 collaborators and Network 199,980 edges from Microsoft Academic Graph **Teams' Collaboration** 16,400 collaborators split over 1700 teams identified using strongly connected components Network in Microsoft Academic Graph

Inflated Google Drive

Authors' Collaboration





How much does the **privacy loss decrease if team members** only account for other members' decisions ?

Teams' Collaboration Network

Users modeled by our study

Users who always take the optimal decision

Hamza Harkous Karl Aberer ACM CODASPY'17



Individuals' Networks

How much does the **privacy loss decrease?**

Inflated Google Drive Network		Authors' Collaboration Network	
Users modeled by our study	41%	28%	
Users who always take the optimal decision	70%	40%	

Teams' Networks

