

Experience Design Framework for Securing Large Scale Information and Communication Systems

Azadeh Nematzadeh

Omar Sosa-Tzec

School of Informatics and Computing
Indiana University

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AGENDA

- 1. Security and Privacy Concerns**
- 2. Information and Communication Systems (ICSs) Concerns**
- 3. Complex Systems and ICSs**
- 4. Security and Privacy Framework**
- 5. Implications**
- 6. Conclusions**



1. Security and Privacy Concerns

Instagram

amazon

citibank

facebook®

*As designers, what and how
do we think about
security and privacy
of Information and
Communication Systems?*



People have **different**
privacy and security **concerns**

RESPONSIBILITY ON THE USERS' HANDS




Picture source: <http://bit.ly/1xFLspW>



[Banking](#) [Credit Cards](#) [Lending](#) [Investing](#)

First time user?

REGISTER

 **SIGN ON TO CITIBANK**

User ID

Password

☐ Remember my User ID

SIGN ON

Email or Phone

☐ Keep me logged in

Password

[Forgot your password?](#)

Sign Up

It's free and always will be.

First Name


Last Name


Your Email

Re-enter Email

New Password

Birthday

Month 

Day 

Year 

[Why do I need to provide my birthday?](#)

☐ Female ☐ Male

BETWEEN PUBLIC AND PRIVATE



Azadeh Nematzadeh

Timeline

About

Photos

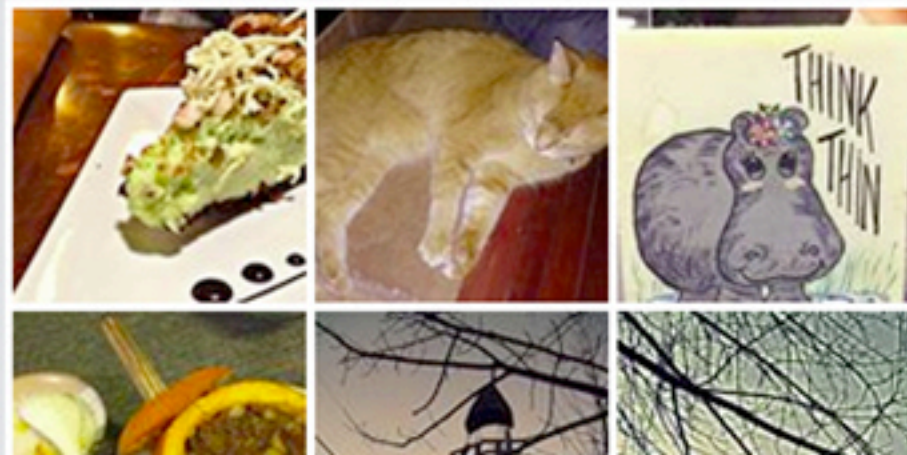
DO YOU KNOW AZADEH?

To see what she shares with friends, [send her a friend request.](#)

ABOUT

Worked at **Nokia Siemens Networks**

PHOTOS

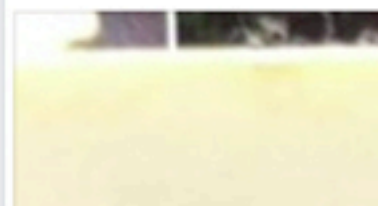


Azadeh Ne
December 21

Happy Yalda Night



Azadeh Ne
December 1,



Azadeh Nematzadeh

Timeline

About

Photos 700

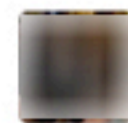
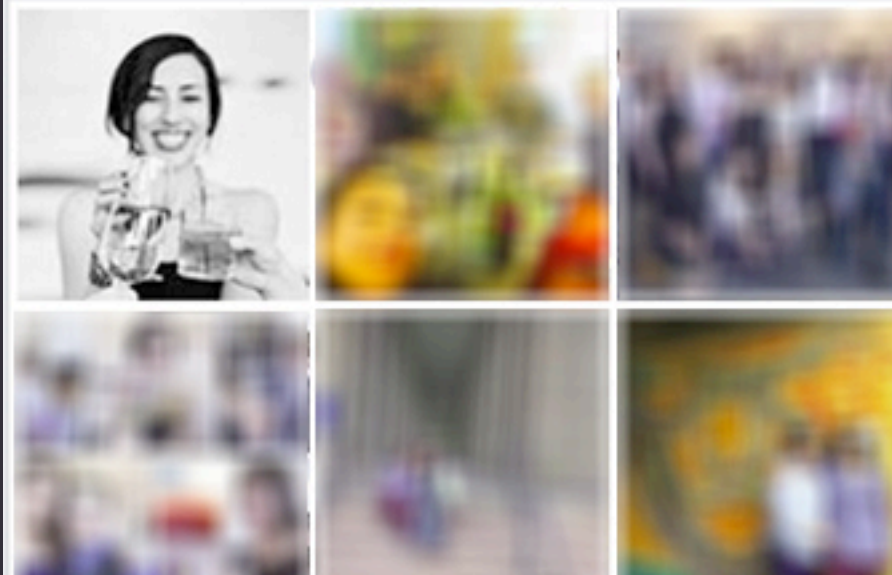
ABOUT

Worked at **Nokia Siemens Networks**

Studied Informatics at **Indiana University**

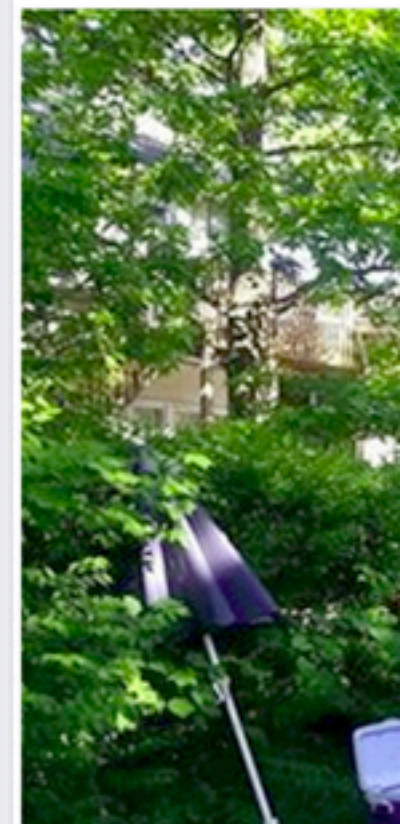
Lives in **Bloomington, Indiana**

PHOTOS · 700



May 31

First girl of the seas
and 4 other



The background of the slide is a deep red color. It features a complex, abstract network of thin, white lines that connect various points, creating a web-like structure. This pattern is most prominent in the top and bottom sections of the slide, framing the central text area. The lines vary in density and form, suggesting a dynamic and interconnected system.

Unknown and unpredictable security and privacy **threats and failures**

tumblr.

WIKIPEDIA

SOUNDCLOUD

reddit

tum

PEDIA



SOUND

ddit

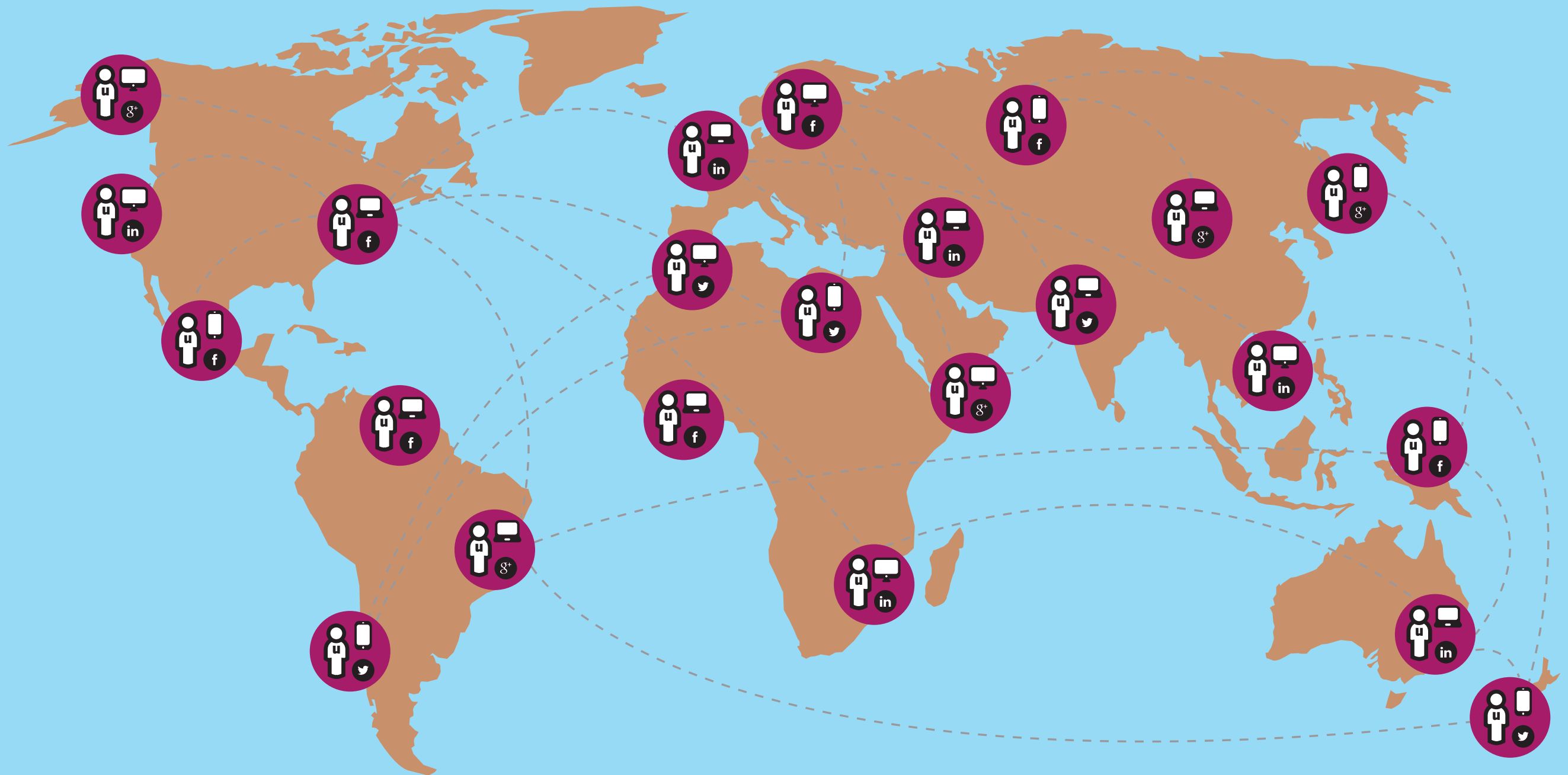


2. ICSs concerns



Heterogeneity of users

DIVERSE PEOPLE: A “WORLD” USING ICSSs





ICSs entail
multiple use scenarios

SAME SYSTEM, DIFFERENT USE



Justin Bieber @justinbieber · 2h

.@marlenebravo70 miss u too ;) #beliebers shots.me/p/j13possu #selfie



13K



16K



Doctors w/o Borders @MSF_USA · 7h

Want to work in the field with MSF? Join us for a free recruitment webinar on June 26 at 7pm EST. Register: bit.ly/1ioUNca



31



14



DIFFERENT SECURITY AND PRIVACY SCENARIOS

Security Settings

Login Notifications	Get notified
----------------------------	--------------

Login Approvals	Use your ph into your acc
------------------------	------------------------------

Code Generator	Use your Fa
-----------------------	-------------

App Passwords	Use special password on
----------------------	----------------------------

Trusted Contacts	Pick friends out.
-------------------------	----------------------

Trusted Browsers	Review whic
-------------------------	-------------

Where You're Logged In	Review and
-------------------------------	------------

Privacy Settings and Tools

Who can see my stuff?	Who can see y
------------------------------	---------------

	Review all you
--	----------------

	Limit the audie friends of friend
--	--------------------------------------

Who can contact me?	Who can send
----------------------------	--------------

	Whose messag
--	--------------

Who can look me up?	Who can look y provided?
----------------------------	-----------------------------

	Who can look y provided?
--	-----------------------------



Use scenarios **change** over time



The background of the slide features a complex, abstract network pattern. It consists of numerous small, interconnected nodes and lines, creating a web-like structure that spans the entire frame. The pattern is rendered in a light, golden-brown color against a dark, textured background. The lines vary in thickness, and the nodes are represented by small, irregular shapes, giving the overall effect a sense of dynamic connectivity and complexity.

Information and Communication Systems **also change**



2004



2005



2006



2007



2008



2009



2010



2011

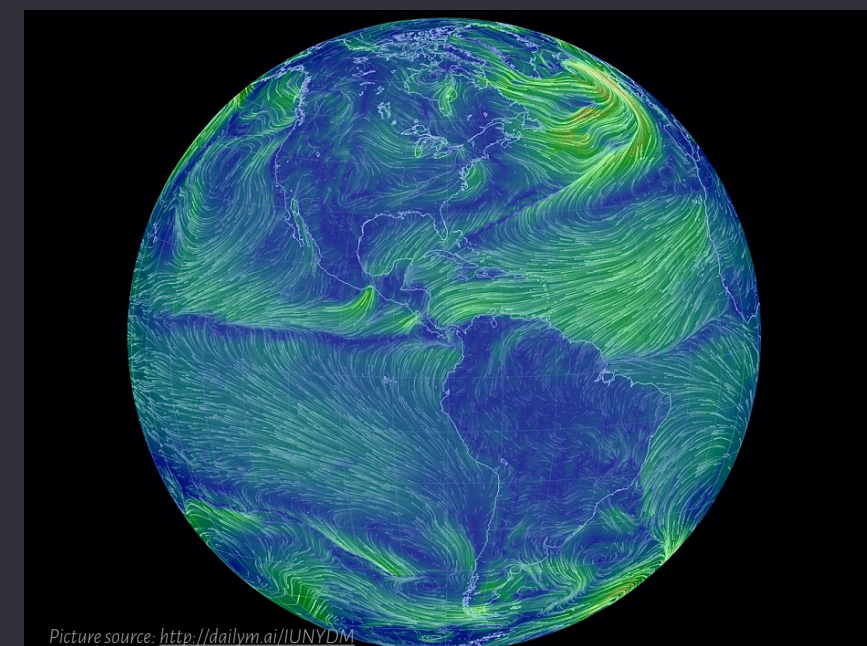


2012



3. Complex Systems and ICSs

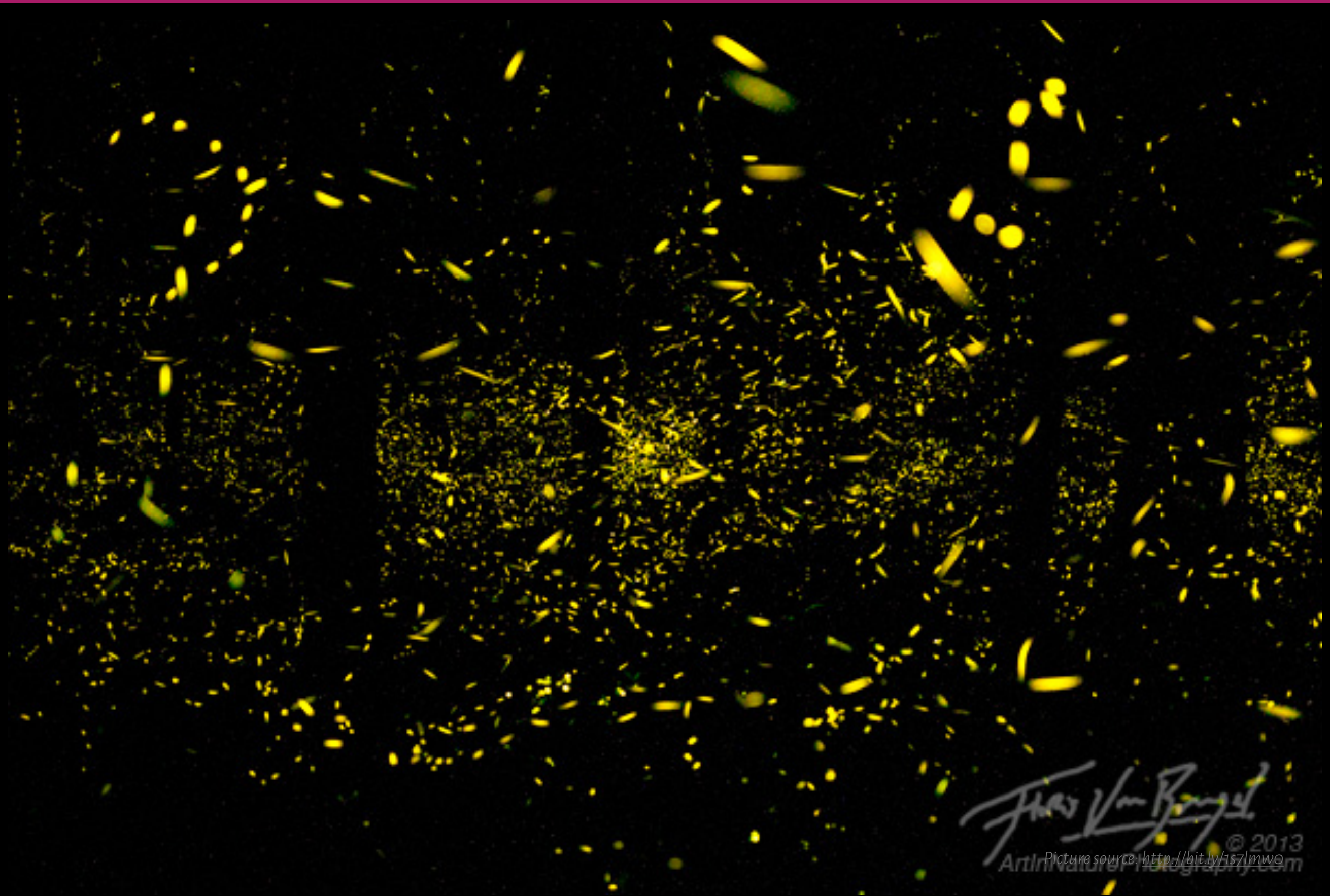
COMPLEX SYSTEMS



The background of the slide is a deep red color. It features a complex, abstract network pattern of thin, light red lines that connect various points, creating a web-like structure. This pattern is most prominent in the top and bottom sections of the slide, framing the central text area.

Aspects of security and privacy in
ICSs show the characteristics of
complex systems

SELF-ORGANIZATION

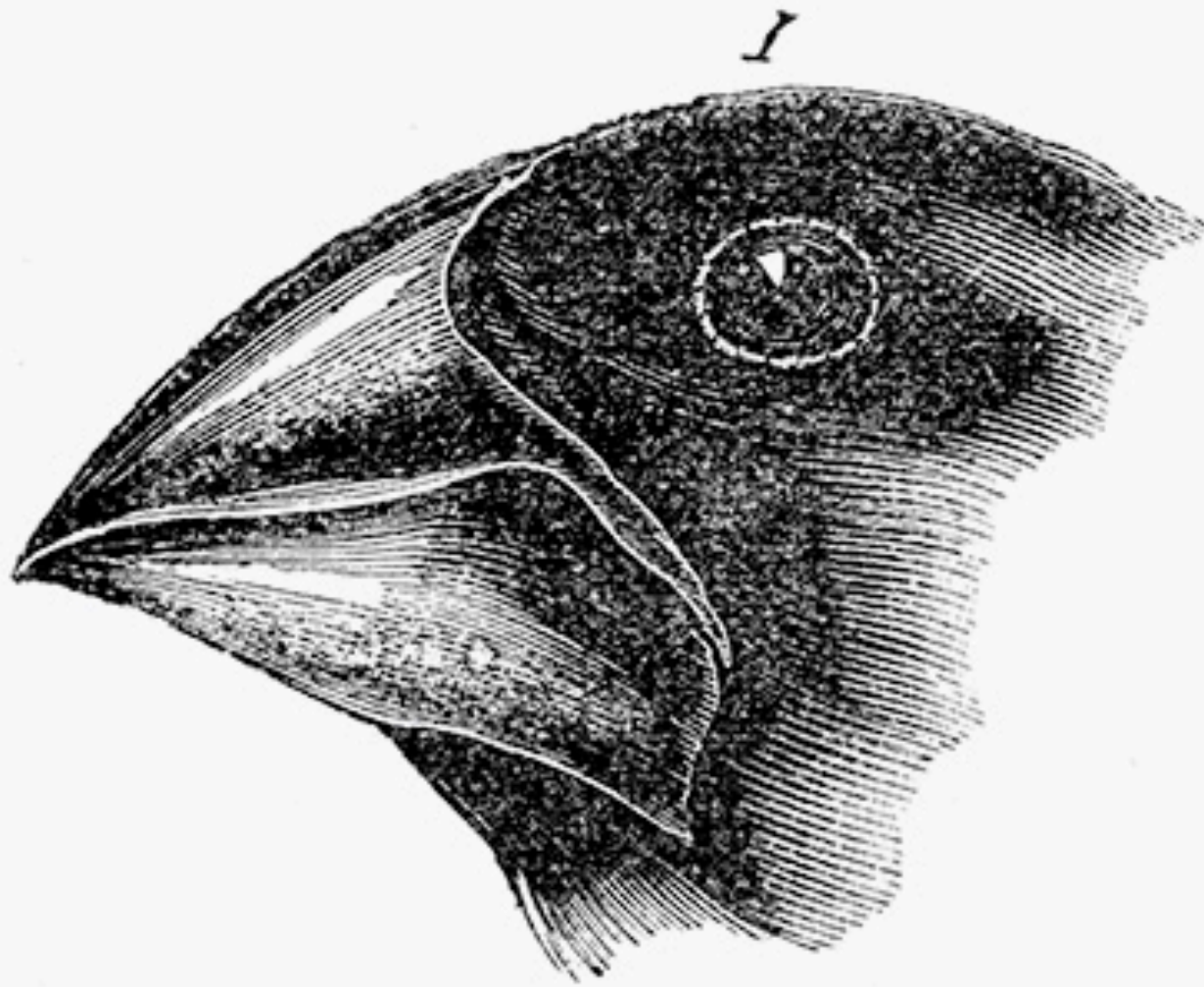


EMERGENCE

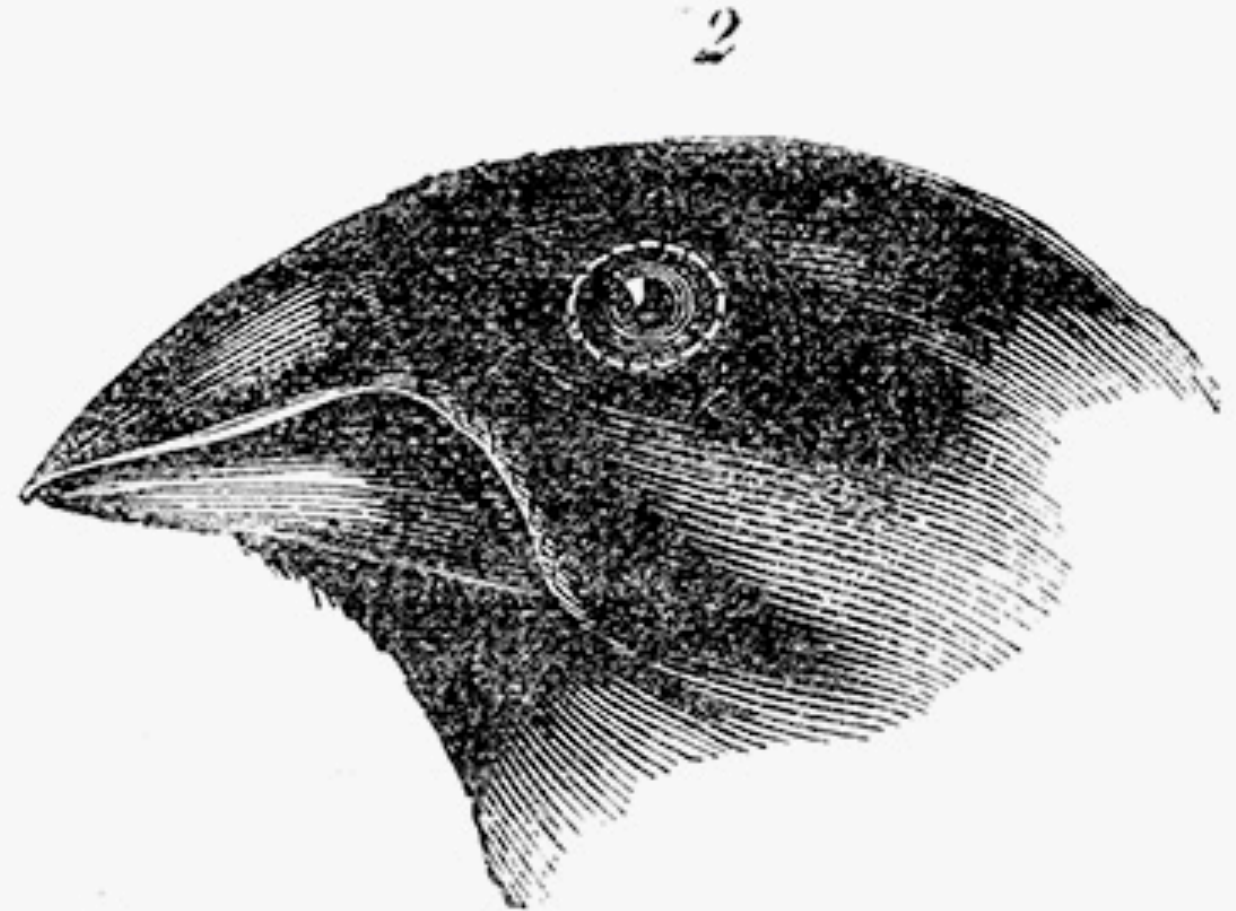


Picture source: <http://bit.ly/1kQ3X64>

EVOLUTION



1. *Geospiza magnirostris*.



2. *Geospiza fortis*.

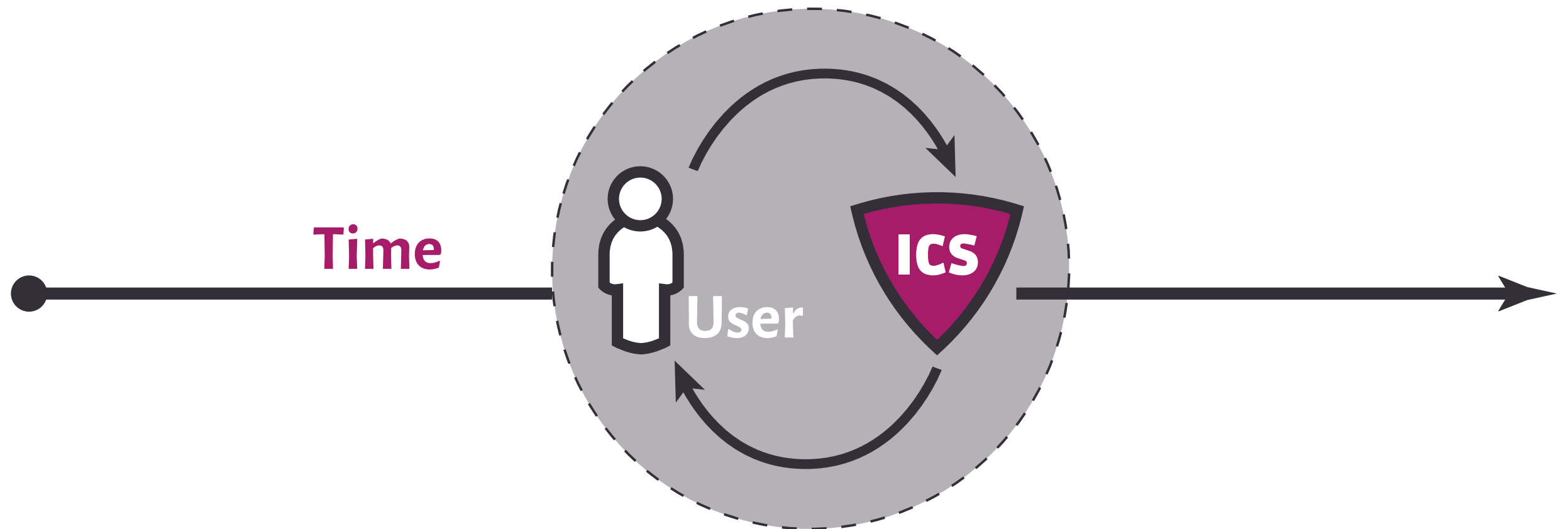
COEVOLUTION



Picture source: <http://bit.ly/1nxVy70>



As complex systems, ICSs entail
user-system coevolution



User-System Coevolution



4. Security and Privacy Framework

SECURITY AND PRIVACY CHALLENGES FOR EXPERIENCE DESIGN

Heterogeneity of users

User's privacy and security
concerns and behaviors

Multiple use scenarios

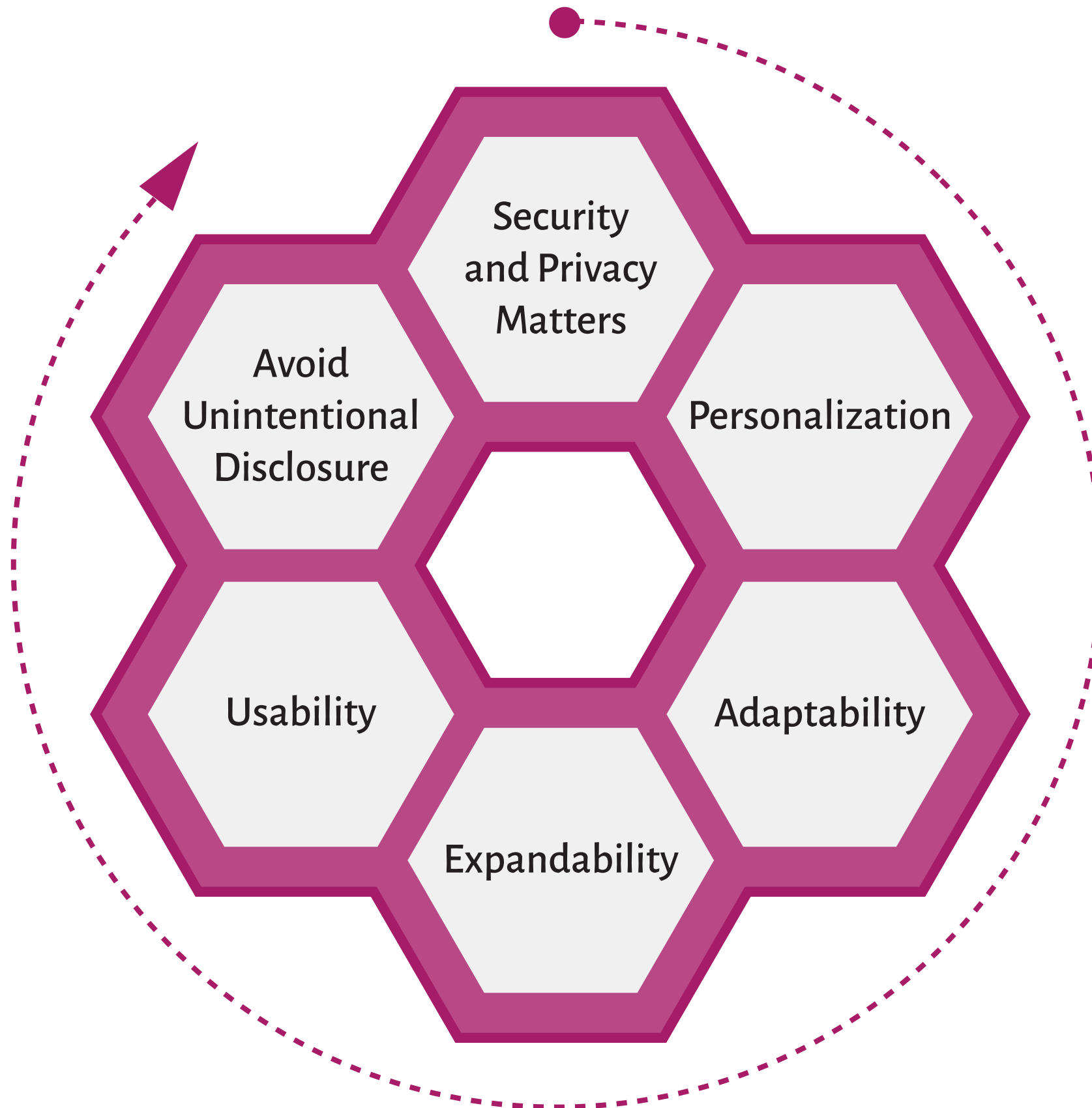
Evolvable use scenarios

Evolution on ICT infrastructure

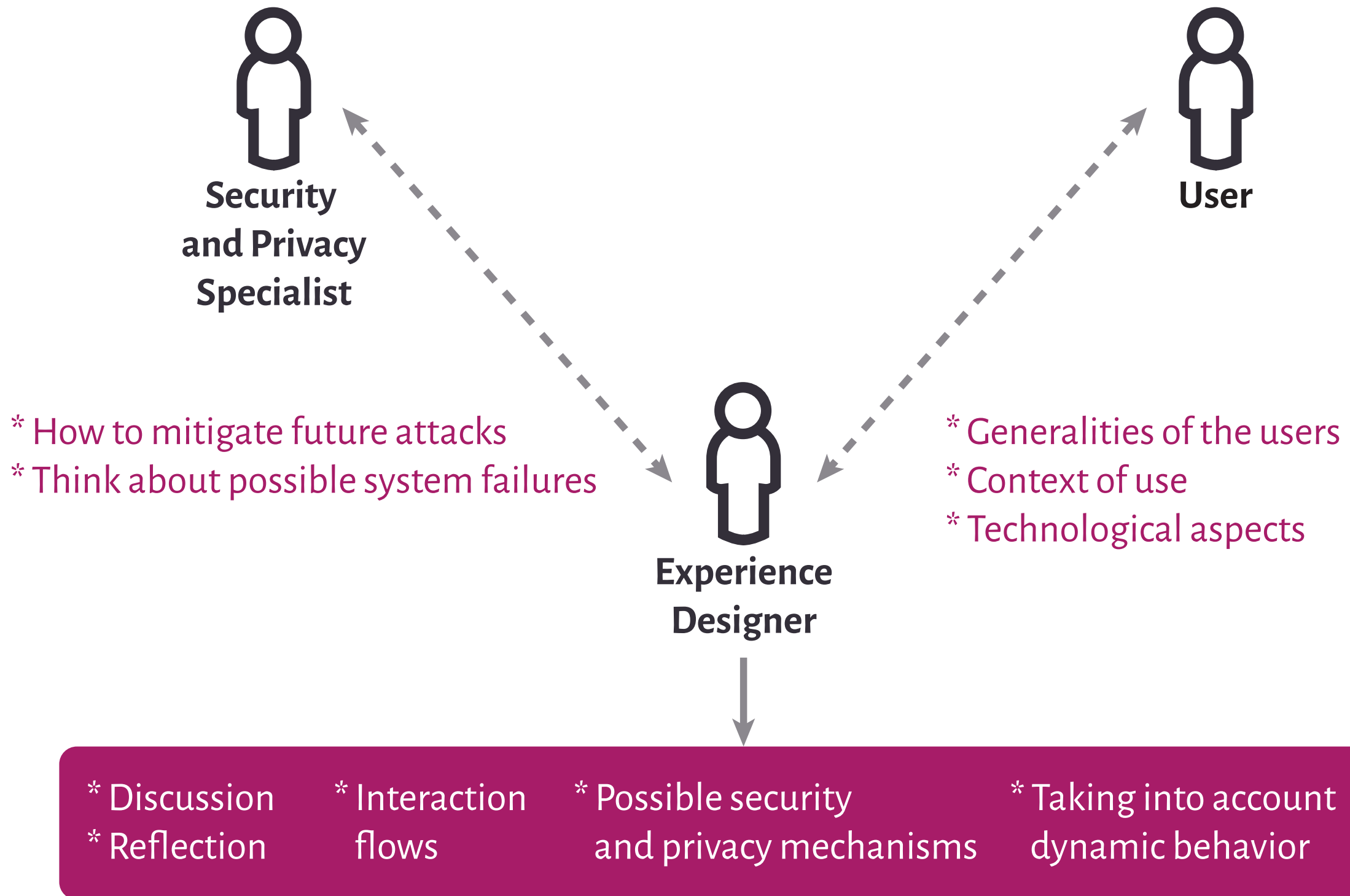
Complex System

```
graph LR; A[Heterogeneity of users] --- J(( )); B[User's privacy and security concerns and behaviors] --- J; C[Multiple use scenarios] --- J; D[Evolvable use scenarios] --- J; E[Evolution on ICT infrastructure] --- J; J --> F[Complex System];
```

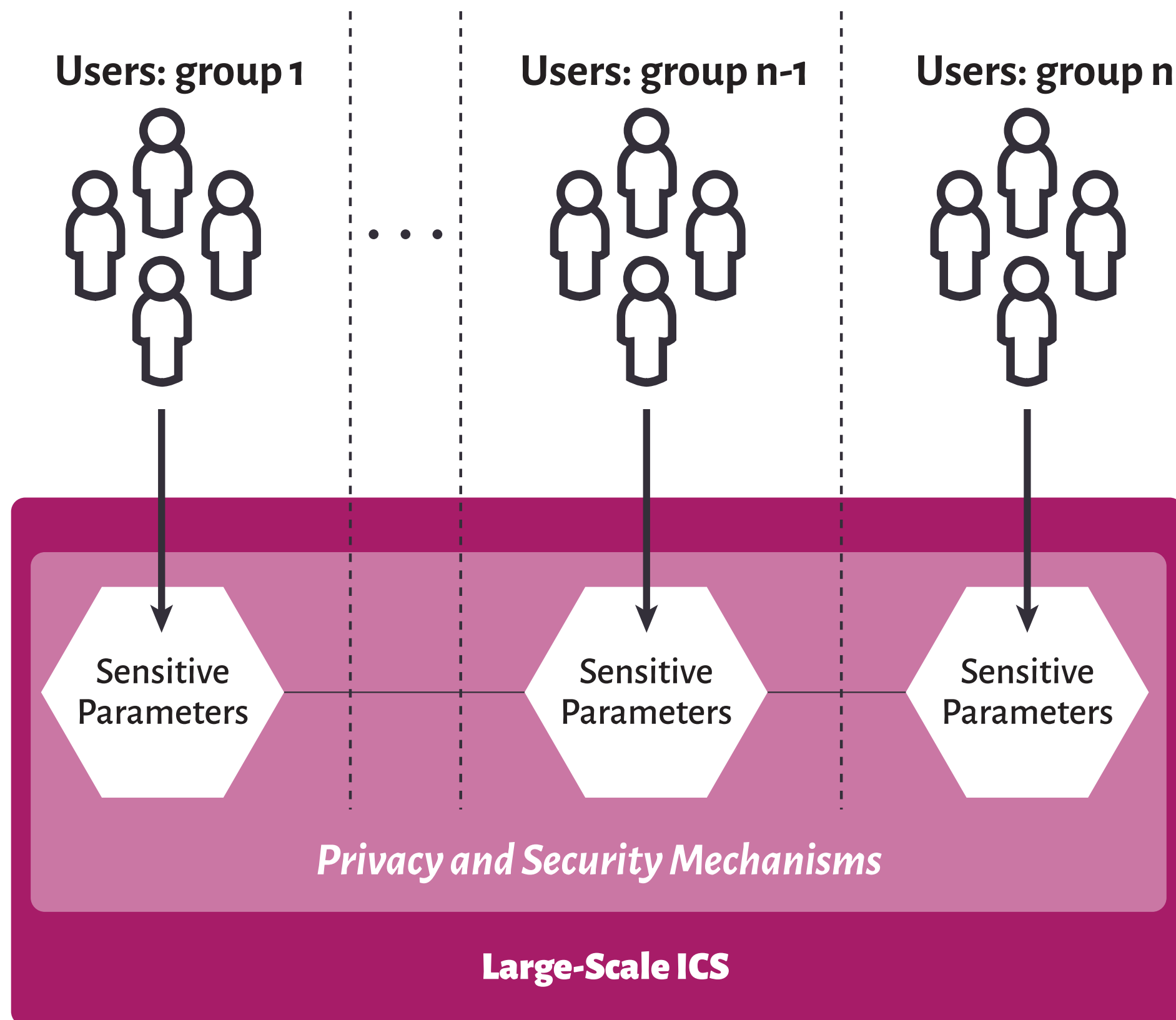

FRAMEWORK



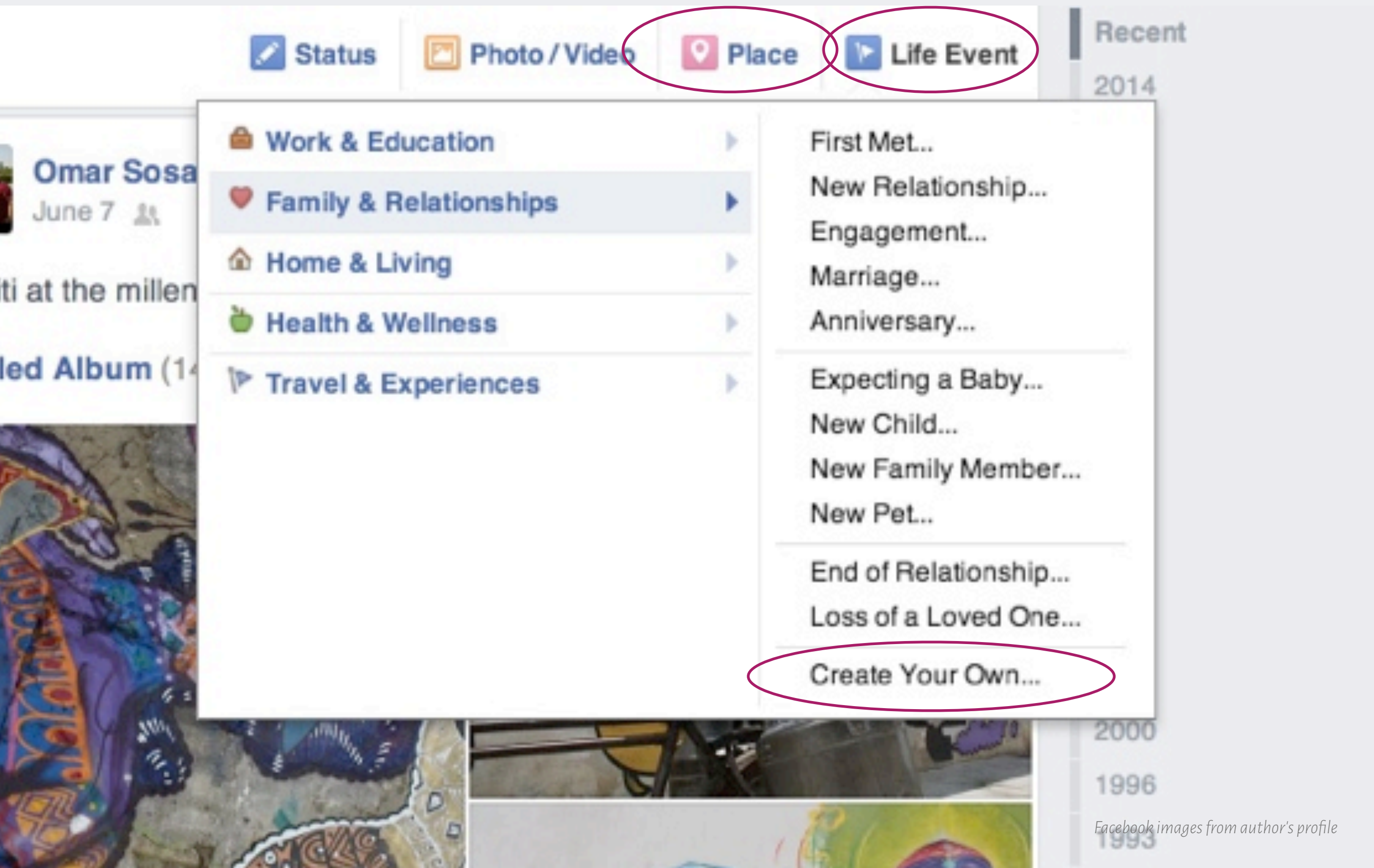
SECURITY AND PRIVACY MATTERS



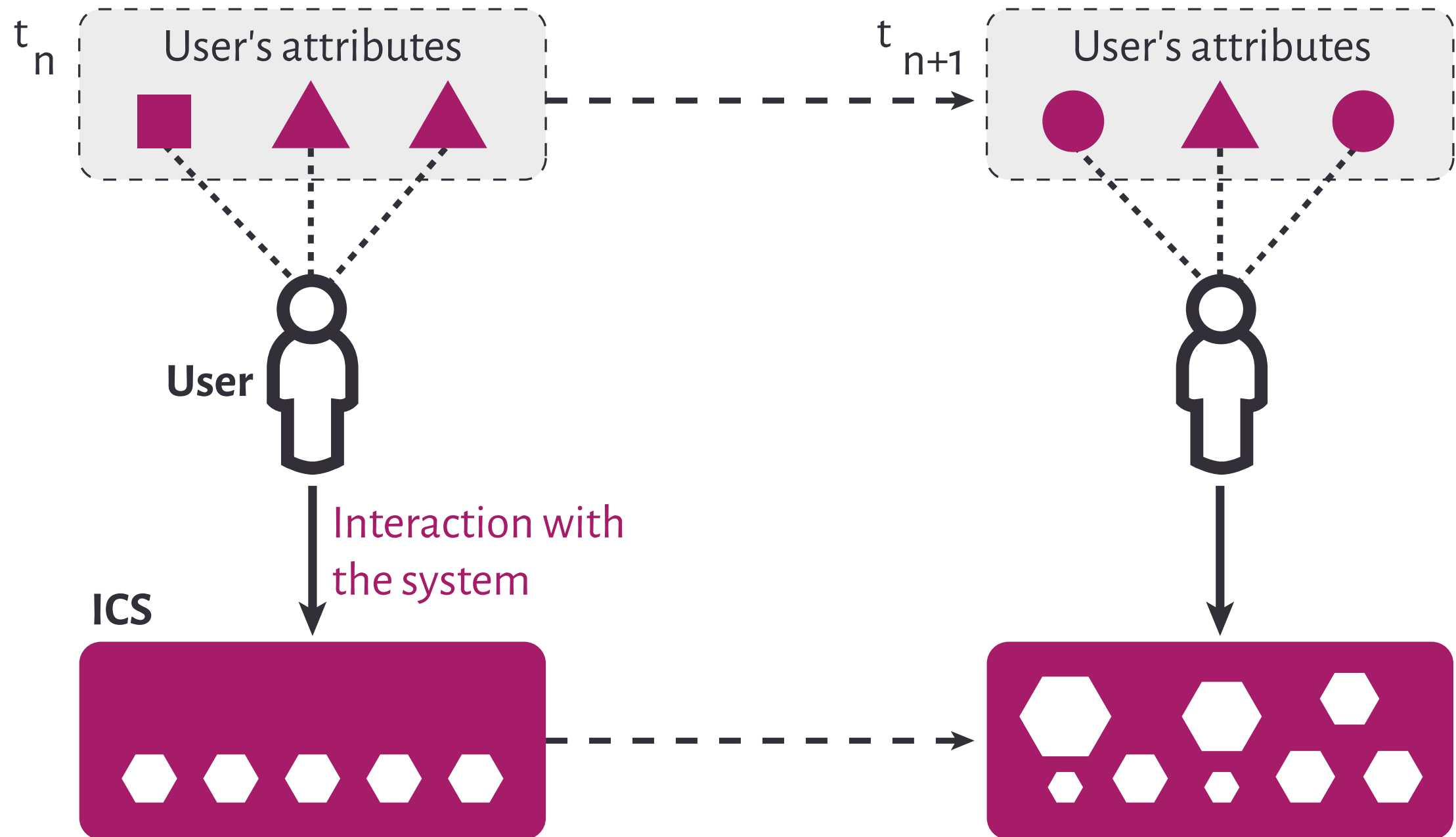
PERSONALIZATION



PERSONALIZATION



ADAPTABILITY, EXPANDABILITY AND USABILITY



ADAPTABILITY, EXPANDABILITY AND USABILITY

Tell Us What You Think

1 of 15

How much do you agree with this statement?
I wouldn't want to miss this post.

Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree

Roy needs your help!

Join your friends in FarmVille, the world's biggest farming game! Grow hundreds of crops, trees, and animals! More added every day

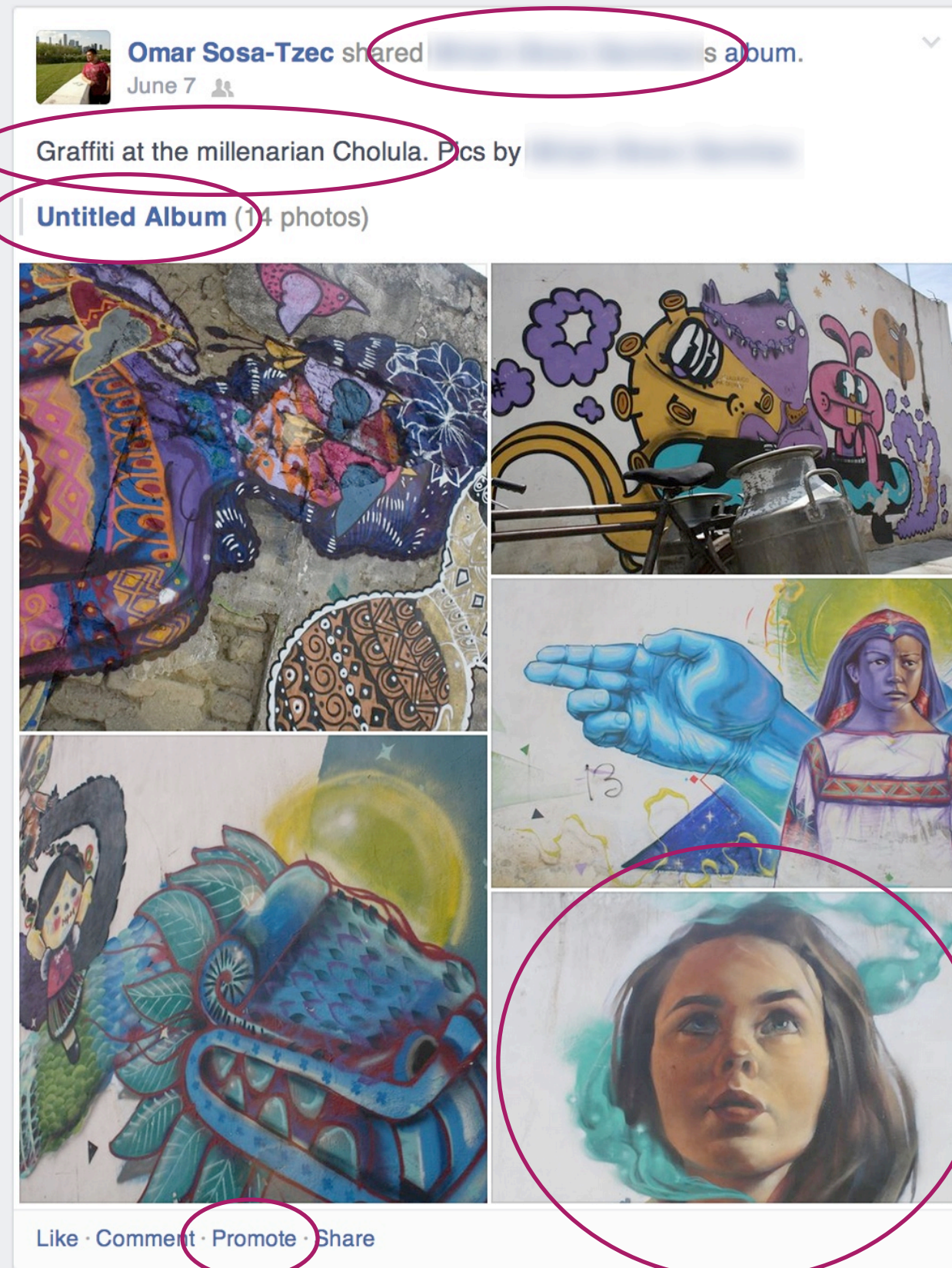
NEEDS HELP SELLING THEIR RUBBER DUCKIE SET....

Like · Comment · Share · Help Now!

Write a comment...

Facebook images from author's profile

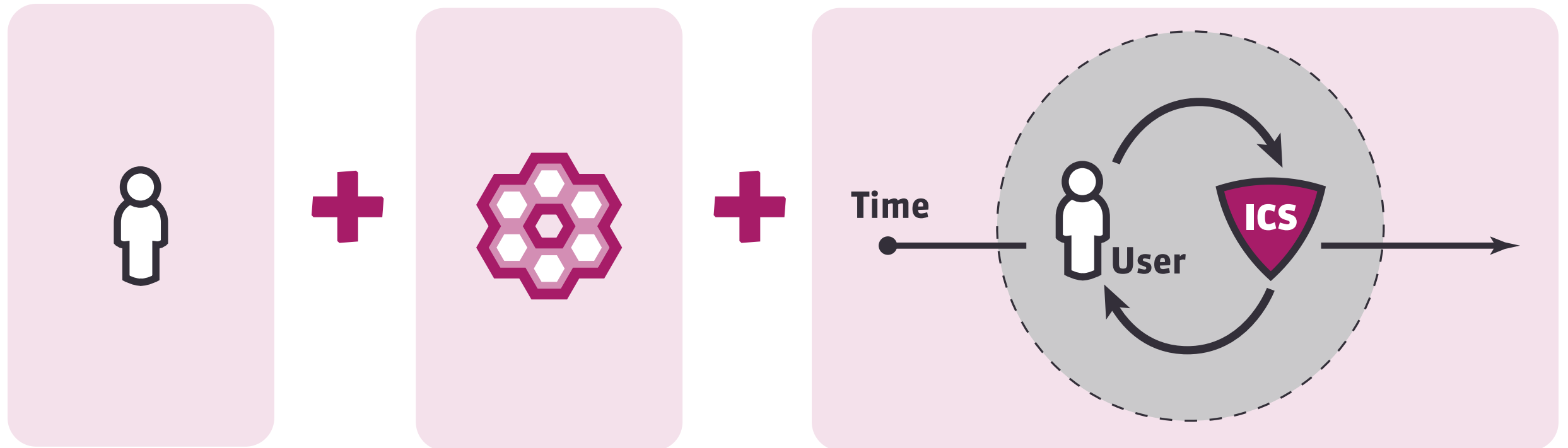
UNINTENTIONAL DISCLOSURE



The background of the slide is a complex, abstract wireframe mesh. It consists of numerous interconnected lines forming a series of triangles and polygons, creating a three-dimensional, crystalline or molecular-like structure. The lines are thin and grey, set against a plain white background. The overall effect is one of intricate geometric complexity.

5. Implications

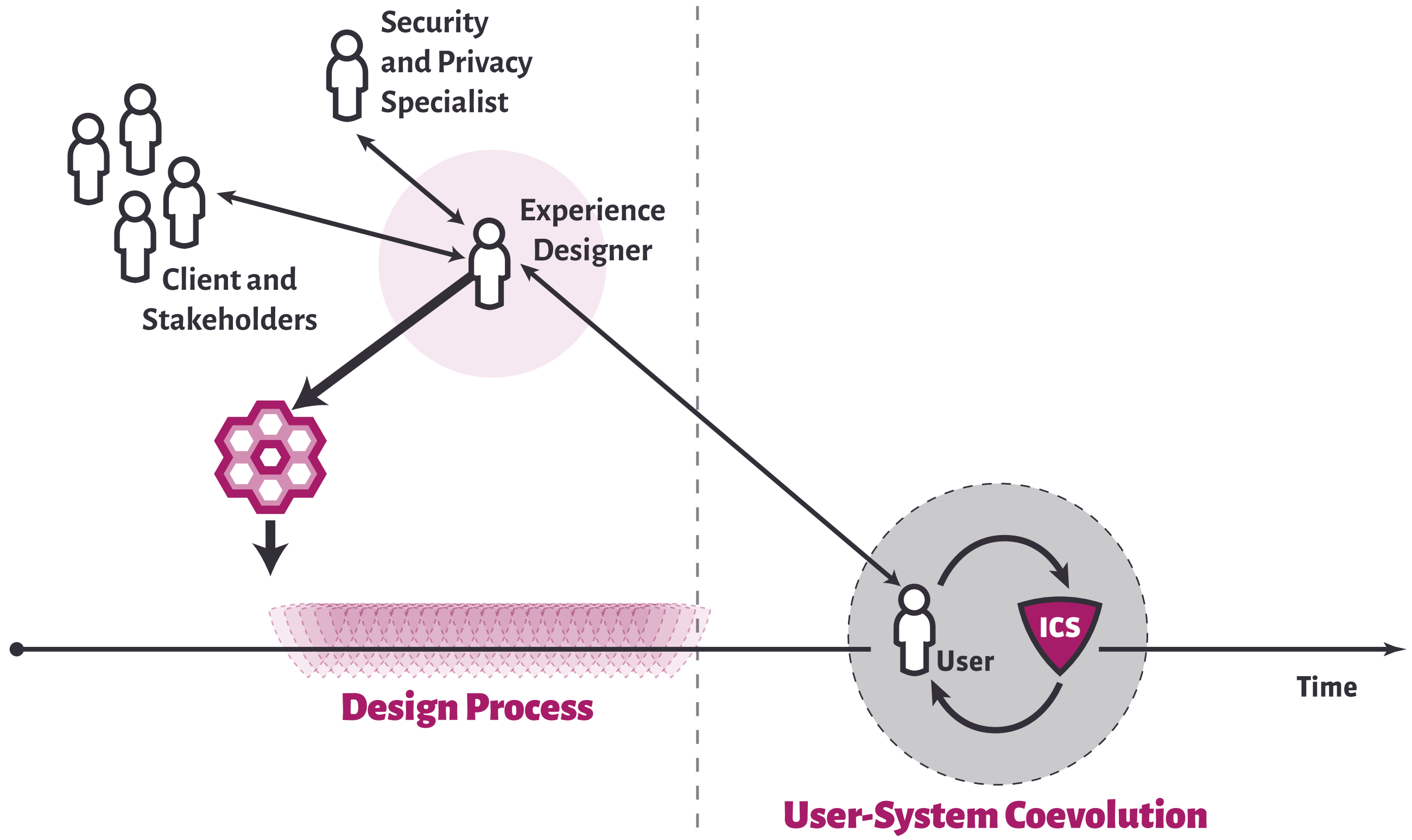
WHAT IS THE MEANING OF THIS RELATION?



An abstract network pattern of thin white lines connecting various points, creating a complex web-like structure against a dark red background.

The experience designer as **translator and communicator** of knowledge

An abstract network pattern of thin white lines connecting various points, creating a complex web-like structure against a dark red background.






ICSs entail a challenge for
both **design practice**
and **design pedagogy**

The background of the slide is a complex, abstract wireframe mesh. It consists of numerous interconnected points and lines, creating a 3D effect of a distorted grid or a network of triangles. The lines are thin and grey, while the points are small dots. The overall shape is irregular and organic, filling the entire frame.

6. Conclusions



We proposed an experience
design framework constituted
by **six security and
privacy principles**

A decorative network pattern of thin, light-colored lines connecting various points, creating a web-like structure, is visible in the top header area.

Security and Privacy Matters

Personalization

Adaptability

Expandability

Usability

Avoid Unintentional Disclosure

A decorative network pattern of thin, light-colored lines connecting various points, creating a web-like structure, is visible in the bottom footer area.

A decorative network pattern of thin, light-colored lines connecting various points, creating a web-like structure, is visible in the top header area.

Complex Systems

Heterogeneity of Users

Multiple and Evolvable Use Scenarios

User-System Coevolution

Security and Privacy

Experience Design

A decorative network pattern of thin, light-colored lines connecting various points, creating a web-like structure, is visible in the bottom footer area.



Our attempt is to open
a **conversation about security
and privacy**, and also about the
implications of user-system
coevolution in ICSs
for experience design.





Questions?

DRS
2014

Thank you!

azadnema@indiana.edu

<http://mypage.iu.edu/~azadnema/>

omarsosa@indiana.edu

<http://tzec.com/>

Paper available at:

<http://goo.gl/qZ7qsA>