



Faculty of Design

2013

Designing Entanglement: Holistic approach to a new pattern of complexity in digital service design

Chung, Eunki

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Designing Service Entanglement

: holistic approach to new pattern of complexity in service design

prepared by

Eunki Chung

acknowledgements

Jodi Forlizzi, John Zimmerman

Carnegie Mellon School of Design / HCII

prepared for

Relating Systems Thinking & Design 2013, Oslo, Norway

Designing Service Entanglement

: holistic approach to new pattern of complexity in service design

RSD3 2014?

RSD2 2013

prepared for

Relating Systems Thinking & Design 2013, Oslo, Norway



a journey of a thousand miles begins with a single step [Lao-tzu]

Emergence of Service Entanglement research: self-reflection

UPMC Technology Development Center health information visualization service

Carnegie Mellon University interaction design graduate student

Service Design teaching at school of business & dept. of techno-art

Ridibooks (e-book service startup) e-book reading & gifting experience

Samsung Electronics appstore & cloud services for mobile devices x multi-platforms

Mobile App Startup cartoon viewer + content distribution/advertising patent

Apple retail experience + roadmap

Non profit organization north korean teenage defectors' self-reliance

Bain & Company m&a (post-merger integration) strategy

18th Medical Command, U.S. Army medical sergeant (surgery assistance, readiness management)

European Union Chamber of Commerce investment matchmaking

2013

2008

An email from Steve Jobs

Team,

The launch of MobileMe was not our finest hour. There are several things we could have done better:

- MobileMe was simply not up to Apple's standards - it clearly needed more time and testing.
- Rather than launch MobileMe as a monolithic service, we could have launched over-the-air syncing with iPhone to begin with, followed by the web applications one by one - Mail first, followed 30 days later (if things went well with Mail) by Calendar, then 30 days later by Contacts.
- It was a mistake to launch MobileMe at the same time as iPhone 3G, iPhone 2.0 software and the App Store. We all had more than enough to do, and MobileMe could have been delayed without consequence.

We are taking many steps to learn from this experience so that we can grow MobileMe into a service that our customers will love. One step that I can share with you today is that the MobileMe team will now report to Eddy Cue, who will lead all of our internet services - iTunes, the App Store and, starting today, MobileMe. Eddy's new title will be Vice President, Internet Services and he will now report directly to me.

The MobileMe launch clearly demonstrates that we have more to learn about Internet services. And learn we will. The vision of MobileMe is both exciting and ambitious, and we will press on to make it a service we are all proud of by the end of this year.

||| Steve

Research on Services

~~product~~ services

~~business~~ experience on service

VP internet services --- directly report to Jobs

“we have more to learn about internet services. And learn we will”

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Research on Service Entanglement

~~product~~ orchestration of {product, system and services}

~~business~~ experience on service

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Service Entanglement

Service Entanglement results from **multiple interlinked service systems**.

These can be both physical and digital.

- | Entanglement encompasses **people, products, services and systems**.
- | Entangled services are **codependent**.
- | Entangled services **collectively shape an experience** and **create value** for **people and systems**.
- | **Not all values and experiences** from Service Entanglement **are positive**.

: because the services are often superposed and not designed to be a single system

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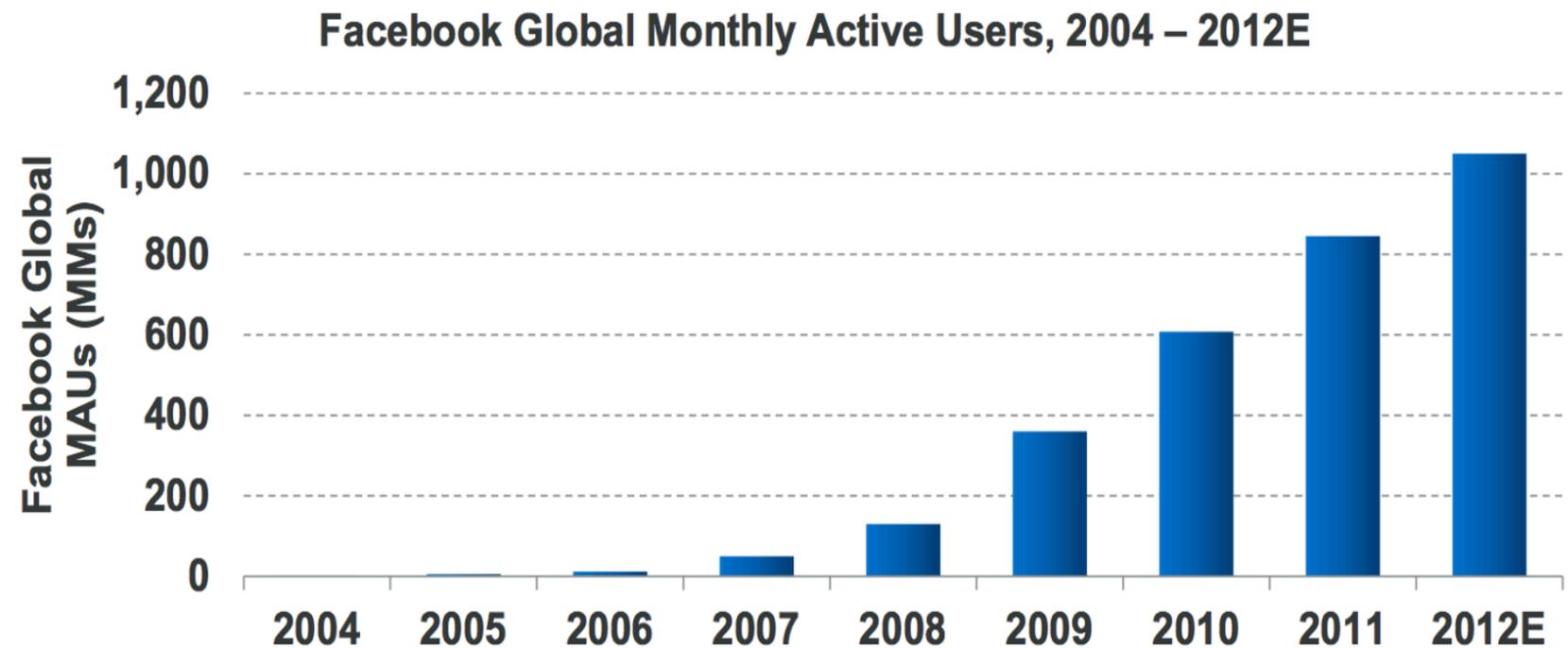
: because the services are often superposed and not designed to be a single system

becoming more conscious of qualities and patterns of relationships among service systems

Why?

Digital services are pervasive in people's life more than ever. Networks among digital services has become not only increased by its number, but denser and stickier in terms of quality.

Digital services are more than just networked, but *entangled*.



Source: Facebook, 2012E MAUs are KPCB estimates.

Why?

Facebook platform supports more than 42 million pages and 9 million apps

COMMENT  SHARE  Tweet  Brittany Darwell • Apr 27th, 2012  Applications, Facebook, Featured, Pages

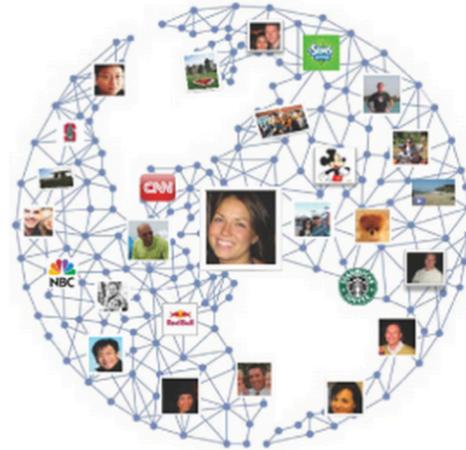
There are now more than 42 million Facebook pages and 9 million apps and websites integrated with Facebook, according to a recent [amendment](#) to the social network's filing for an initial public offering.

The number of pages on Facebook with 10 or more Likes has increased by 5 million since Dec. 31, 2011, and the number of apps and websites that integrate Facebook are up by 2 million since that date. These new totals show that Facebook's platform continues to grow in ways beyond new users. It also shows just how much is competing for users' attention these days.

Facebook did not provide a category breakdown of the 42 million pages on Facebook. However, in a [letter](#) to prospective investors, Facebook CEO Mark Zuckerberg shared that more than 4 million businesses have pages on the site. Other pages on the social network — including many of the [most popular ones](#) — are pages for popular figures, movies and sports teams. A large proportion of pages are also likely to be fan-generated community pages. Unclaimed locations also account for some of these pages, although Facebook has been [working to eliminate duplicates](#).

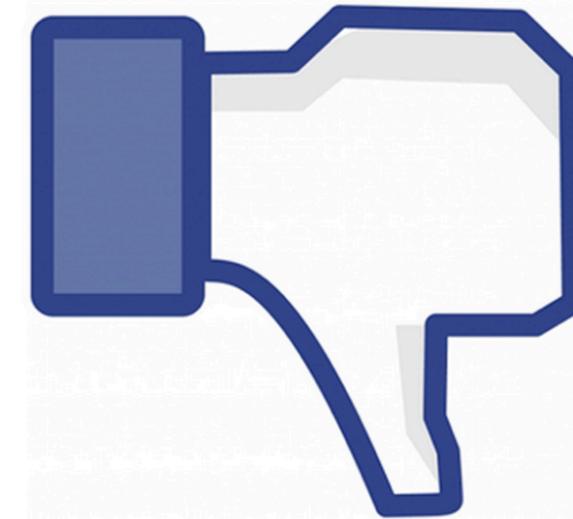
The number of apps and websites connected to Facebook is likely to quickly grow past 9 million. With Open Graph integration proving to be a [large source of traffic](#) for third-party apps and websites, we can expect many more blogs and media sites, as well as mobile games and other apps to implement aspects of the platform

Along with stats about pages and apps, Facebook provided other updated figures for photo uploads, interactions and friend connections in its filing this week. Between Jan. 1 and March 31, there were more than 300 million photos uploaded to the site each day — up from 250 million per day in Q4 2011. Users also generated an average 3.2 billion Likes and comments each day in the first quarter of 2012 — up from 2.7 billion per day in Q4 2011. And Facebook now has more than 125 billion friend connections between its 901 million monthly active users.



GIZMODO

TOP STORIES



FACEBOOK

A Facebook Bug Pretty Much Took Down the Entire Internet

 Casey Chan

If you thought the Internet freaked out for a little bit and every site you went to was down, you're not alone. Major websites were down: CNN, Huffington Post, ESPN, Gawker, The Washington Post, BuzzFeed, etc. were all broken. Why? Because of a glitch with Facebook.

Developers at Gawker said that the glitch

FEB 7, 2013 7:57 PM   +1  Like 1.2k  0

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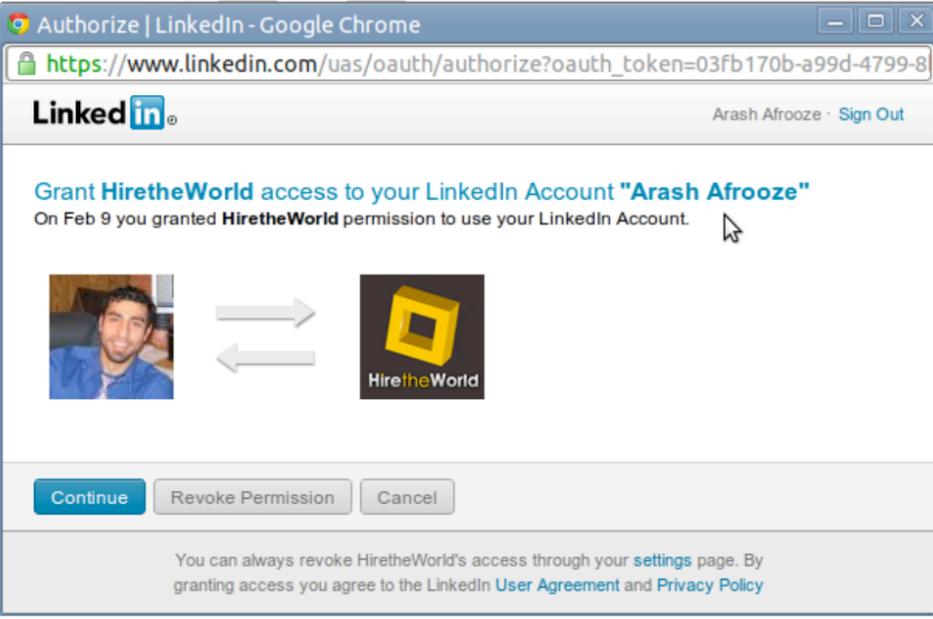
APPLY NOW 

Terms and Restrictions Apply.

Service Entanglement for interaction design



how interaction designers can more contribute to designing a successful system with interdependency on other systems?



Study of Entanglement Examples

Dropbox

Evernote Trunk

Facebook Connect

Facebook Home

Fifty Three & Moleskin

Fitbit Apps

Flipboard

Google Now

Google Wave

IFTTT

iTunes in Starbucks

LinkedIn

Pinterest

SmartThings

Square

Uber

...

Interview with in-house designers

Traditional services
adopted or disrupted by technology services

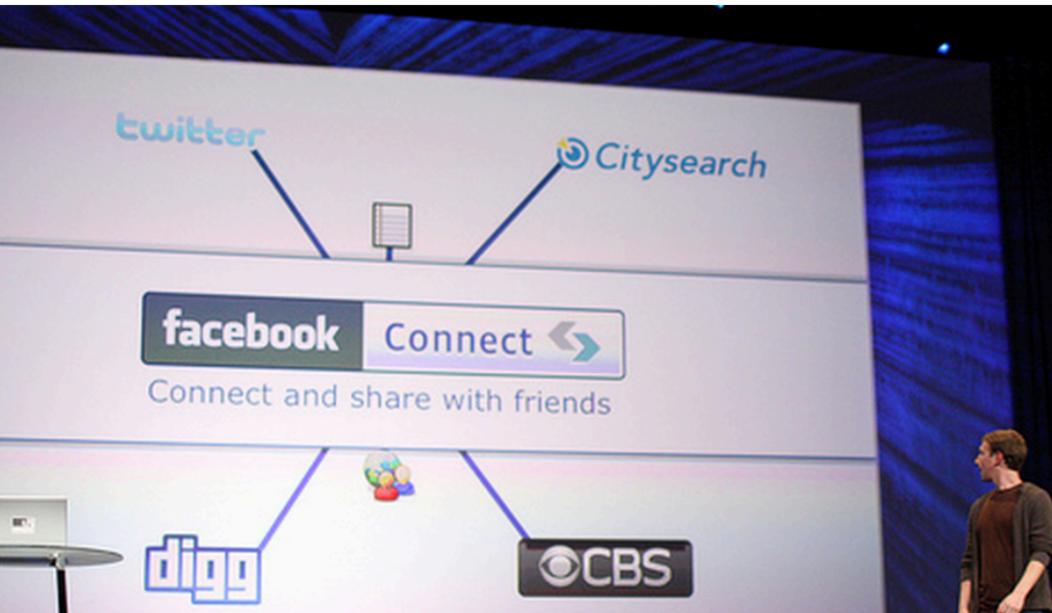
- Healthcare
- Retail
- Public

Technology-based services (corporate)

Technology-based services (startup)

Manufacturing companies
making device to service expansion

Facebook Connect



Request for Permission

www.facebook.com/connect/uiserver.php?app_id=144042852310083&method=permi...

f Request for Permission

ScoreBig is requesting permission to do the following:

- Access my basic information**
Includes name, profile picture, gender, networks, user ID, list of friends, and any other information I've shared with everyone.
- Send me email**
ScoreBig may email me directly at morganb@gmail.com · Change
- Post to my Wall**
ScoreBig may post status messages, notes, photos, and videos to my Wall
- Access my data any time**
ScoreBig may access my data when I'm not using the application
- Access my profile information**
Birth:ay and Current: City

Report App

Logged in as Morgan Brown (Not You?)

Allow **Don't Allow**

Fitbit Apps

fitbit Products **STORE** Dash

MyFitnessPal™

Sync your meals and activities to Fitbit and adjust your daily net calorie goal on MyFitnessPal by the tracker data [Learn more >](#)

Make your experience with Fitbit even more awesome.

Browse Apps

 Lose It! by FitNow, Inc. Sync your meals from Lose It! to Fitbit and extend Lose It! food budget by activities from your Fitbit tracker. Learn more >	 MyFitnessPal by MyFitnessPal, LLC. Sync your meals and activities to Fitbit and adjust your daily net calorie goal on MyFitnessPal by the data measured by your tracker. Learn more >	 SparkPeople™ by SparkPeople, Inc. Link Fitbit to your SparkPeople account and you can dynamically share and sync data - including weight, fitness and sleep - to your SparkPeople profile. Learn more >
 Balance Rewards by Walgreens Sync a Fitbit One, Ultra or Zip	 Microsoft HealthVault by Microsoft Link your accounts now to share	 Digifit by Digifit, Inc. Link Fitbit and Digifit, and your

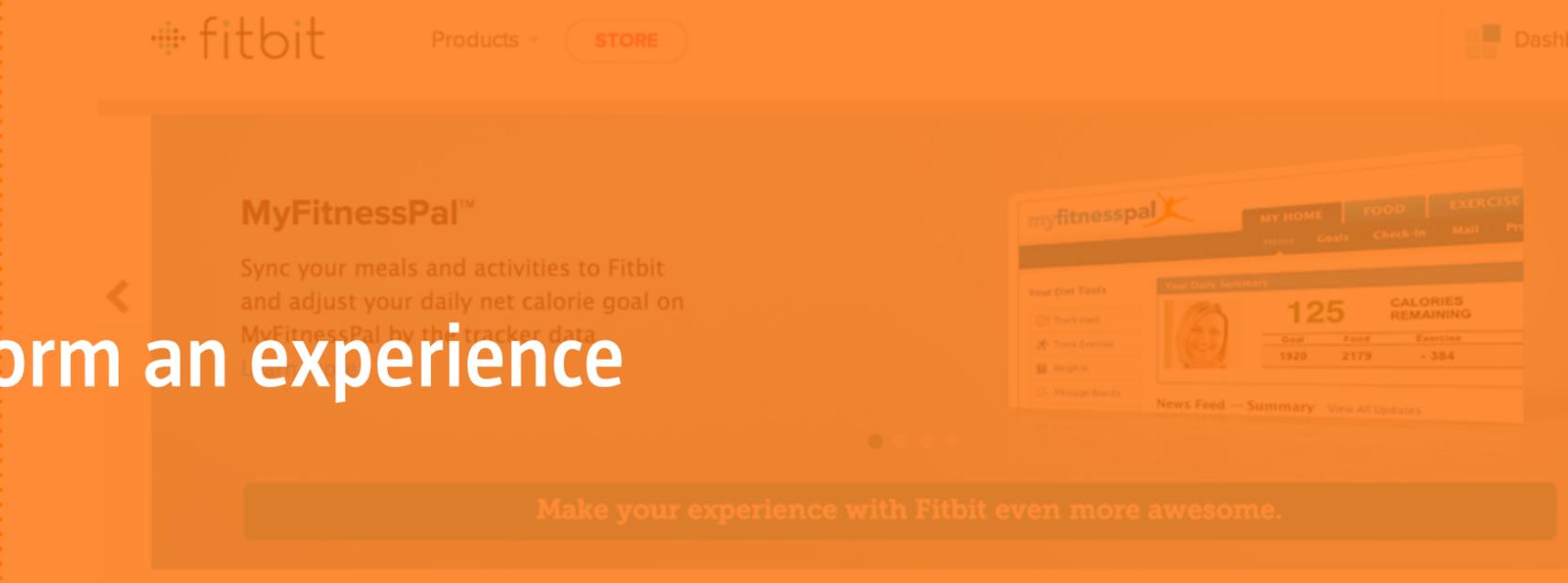
What is this?
Browse the App Gallery to discover new websites and applications that enhance your experience with Fitbit.

Manage your apps [View all >](#)

Want to build some...
The **Fitbit API** allows developers to interact with Fitbit data in their own applications, products and services.

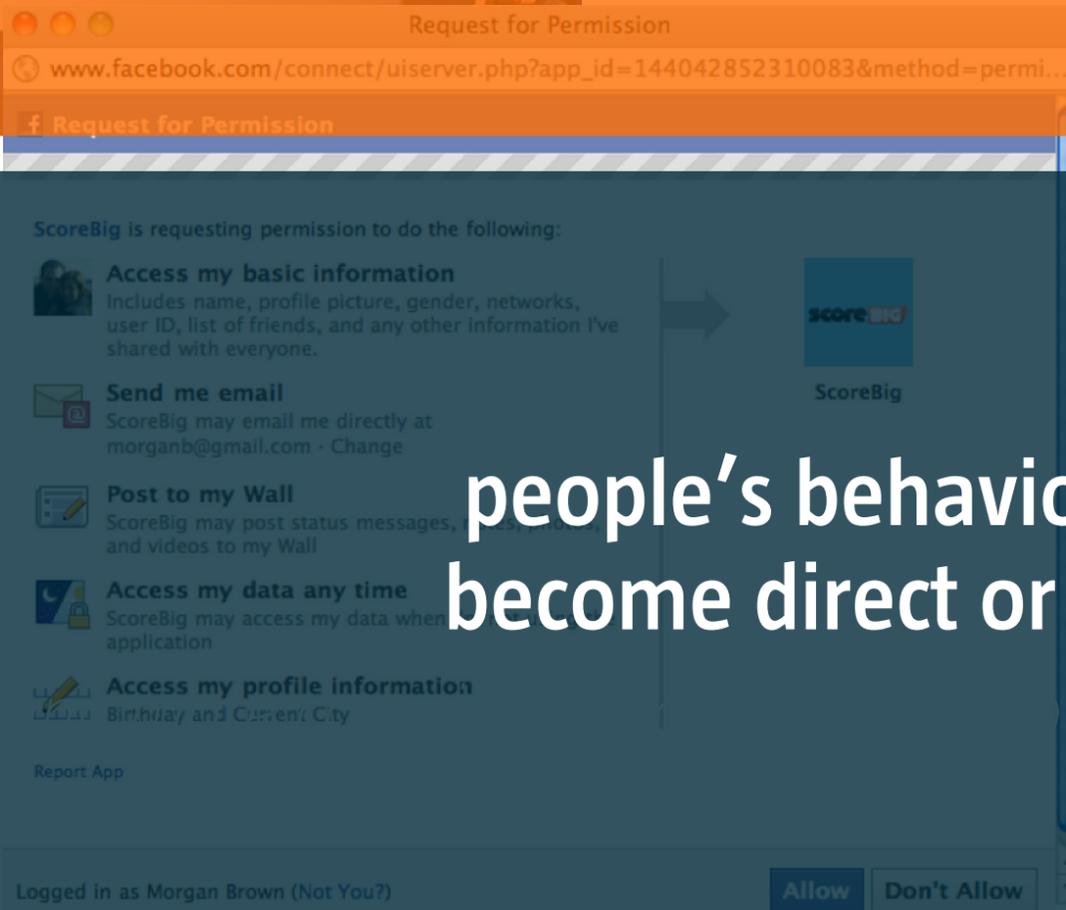
Facebook Connect

Fitbit Apps



multiple services form an experience

experience
value

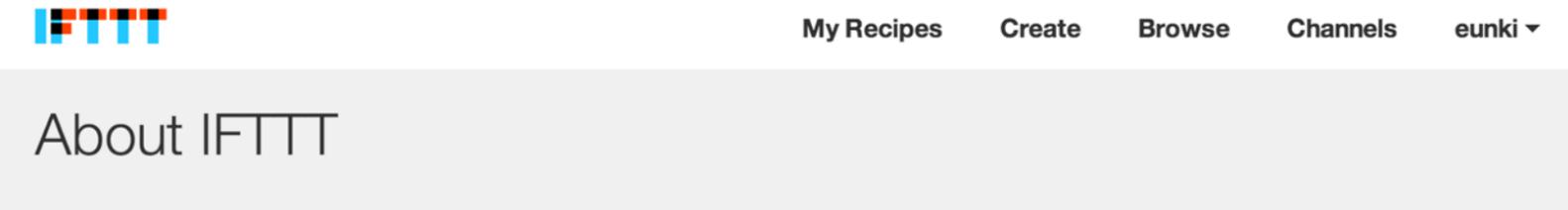


people's behavioral data and metadata
become direct or indirect financial assets



IFTTT

Uber



About IFTTT

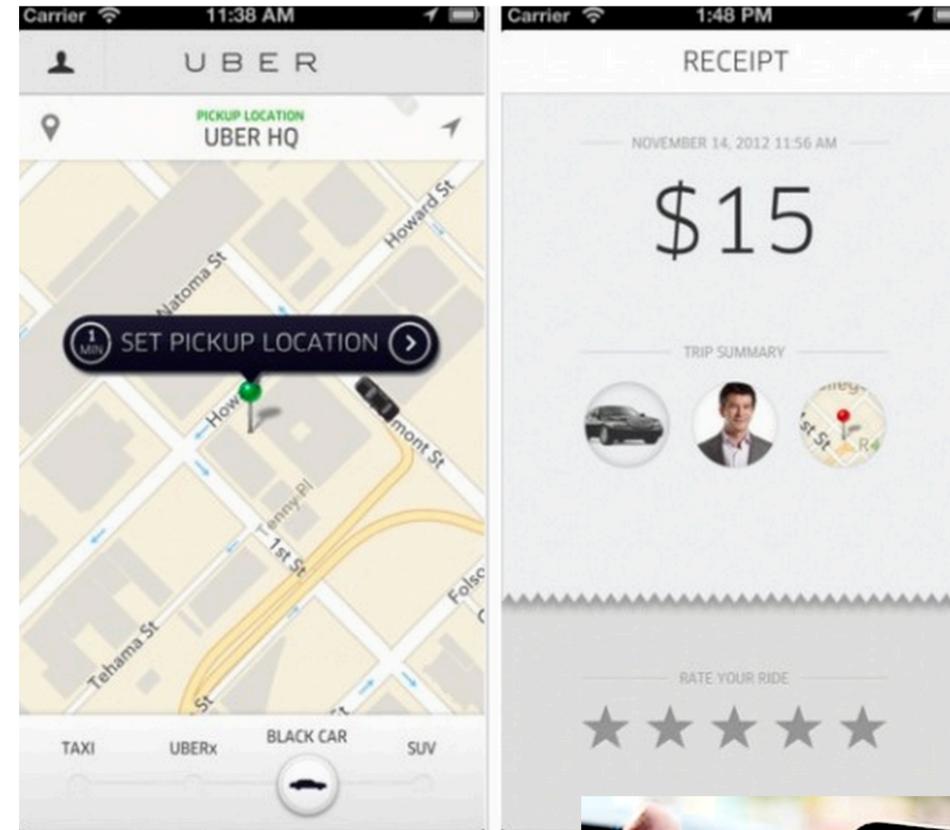
What is IFTTT? IFTTT is a service that lets you create powerful connections with one simple statement:



IFTTT is pronounced like "gift" without the "g."

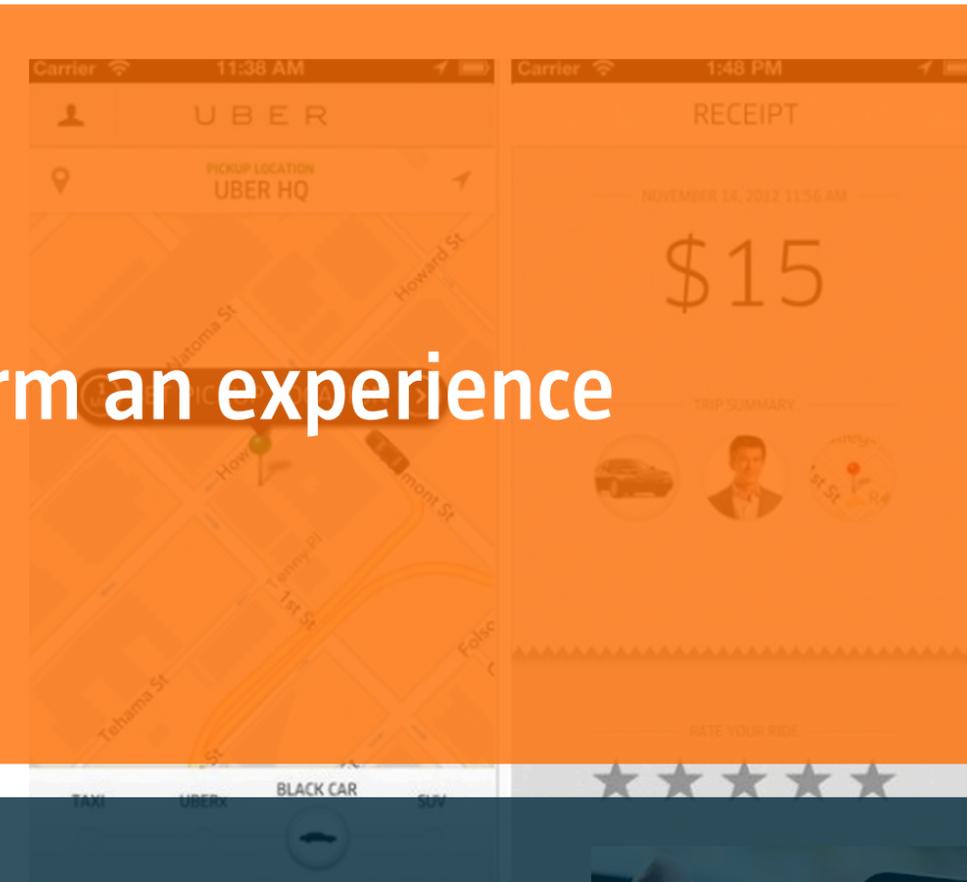
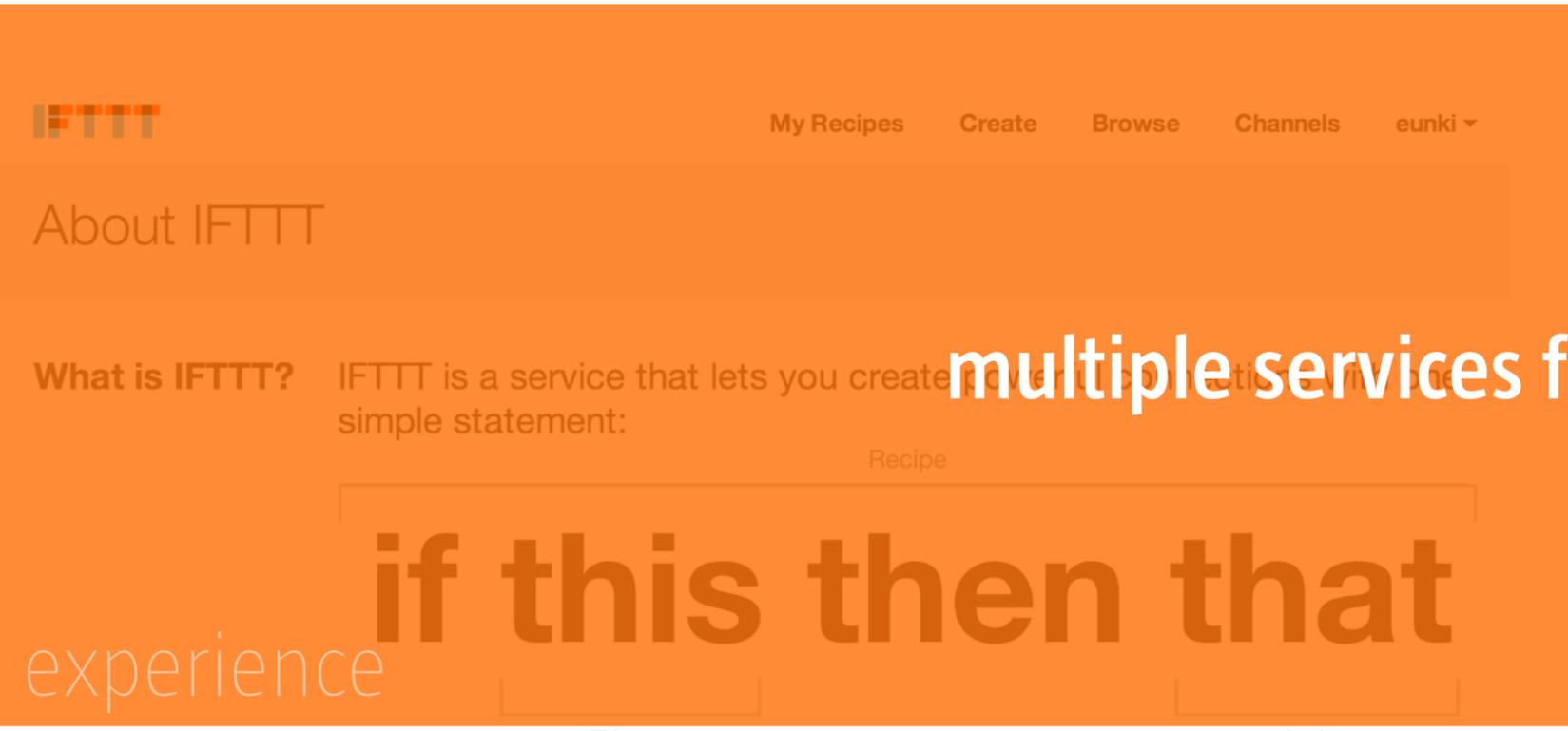
Channels

Channels are the basic building blocks of IFTTT. Each Channel has its own Triggers and Actions. Some example Channels are:



IFTTT

Uber



multiple services form an experience

if this then that

Trigger

Action

IFTTT is pronounced like "gift" without the "g."

Channels are the basic building blocks of IFTTT. They allow you to connect your own Triggers and Actions. Some example Channels are:



Facebook



Evernote



Email



Weather



LinkedIn

recipes*

people's meaningful data* contribute to indirect financial assets

ratings on trustfulness*



experience

value

Channels

Flipboard

Google Wave

The screenshot shows the Flipboard mobile app interface. At the top, it displays the time as 6:55 PM and battery level at 96%. The main content is a grid of social media posts:

- Facebook:** "Add your Facebook account..."
- Twitter:** "A Great Way To Commemorate An Old Friend http://bit.ly/aQQFR2" by Mohammed Yassin.
- Inside Flipboard:** "meet the team! http://farm5.static.flickr.com/"
- FlipTech:** "Support @ablegamers, a charity for videogame accessibility, by GameLife".
- FlipStyle:** "Fab Ad: Gisele Bündchen for Roberto Cavalli: Hip, hip, hooray!" by FabSugar Australia.
- FlipPhotos:** "Oil spill in Dalian, China - http://b.globe.com/bLqKU7." by The Big Picture.
- FlipEats:** "Sometimes in life you have to choose, even though the decision" by Adam Roberts.
- FlipTrip:** "RT @TravelWriting: It's a girl my lord in a flatbed Ford.... RT" by Gadling.

At the bottom right of the grid, there is a button that says "+ Add a Section".

The screenshot shows the Google Wave web interface. The browser address bar displays "http://wave.google.com/". The main content area is titled "Google wave" and shows an "Inbox 1 - 17 of 27".

The inbox list includes:

- Dinner and board games - Who's up for dinner and board games next week? I'm thinking 3:43 pm 1 msg
- Snapshots! - I'm really impressed with all the nature shots we've put together! Desert 3:39 pm 4 msgs
- BBQ on Sunday! - Our house, 6pm Let us know if you can come! What can I bring? Just 3:22 pm 3 msgs
- Sushi time? - Hey Dan and Jens, I think its time for our monthly sushi -tasting dinner Tough 3:19 pm 1 msg
- Hey Steph, - Wanna get coffee tomorrow? We can met by the palm trees 3:16 pm 1 msg
- Wayward music player? - Looking to return Hey, I think your music player ended up left on my desk 1:13 pm 1 msg
- See what turned up on my front lawn yesterday! - It's fairly late in the season to be 1:05 pm 1 msg
- It's Movie Time!!!! - ... Wheee - the 80's are cool again! what about "Confessions of a Shopaholic"? 12:22 pm 9 msgs
- Pics from a walk in Sydney... - Just from walking around in Kirribilli / Milsons Point, 8:05 am 1 msg
- Gallery opening this Thursday - Hey everyone, my show is finall going up and I would love if your 1 msg
- Any tips for combating jet-lag? - Please share! For the first day, stay up as long as possible. Get 5 msgs
- The Castle (Mandatory Fun) - Speaking of movies, who hasn't seen "The Castle"? Such 2 msgs
- Say, here are some photos from the Kokoda track. - Check out the broken wrist! At the 1 msg
- Favorite Place to Travel - Poll - Where do you like to go when you have time off? Brazil India 1 msg
- Who wants to see transformers?! - 1 msg
- Offsite pics! - Check out the photos from our offsite Vista Goofy Helmet So fast Hikes SF 1 msg

On the right side, there is a "Snapshots!" section showing a conversation:

- Noel (and me, Emily): Snapshots!
- I'm really impressed with all the nature shots we've put together!
- Emily: They make me want to go on vacation
- me: Seriously, what a well traveled bunch. Lars, what did you use?
- Lars: Canon: Canon D50 - Canon Digital Ph...
- I'm in the market for a new one. and these look so good. F...

At the bottom right, there are "Tags:" and "Day:"/ "Week:" navigation options.

Flipboard

Google Wave

service provides all-in-one channel experience* through sub-service systems

all in one touchpoint*

all in one webpage*

experience

value

service aims to generate leverage* related to sub-service systems

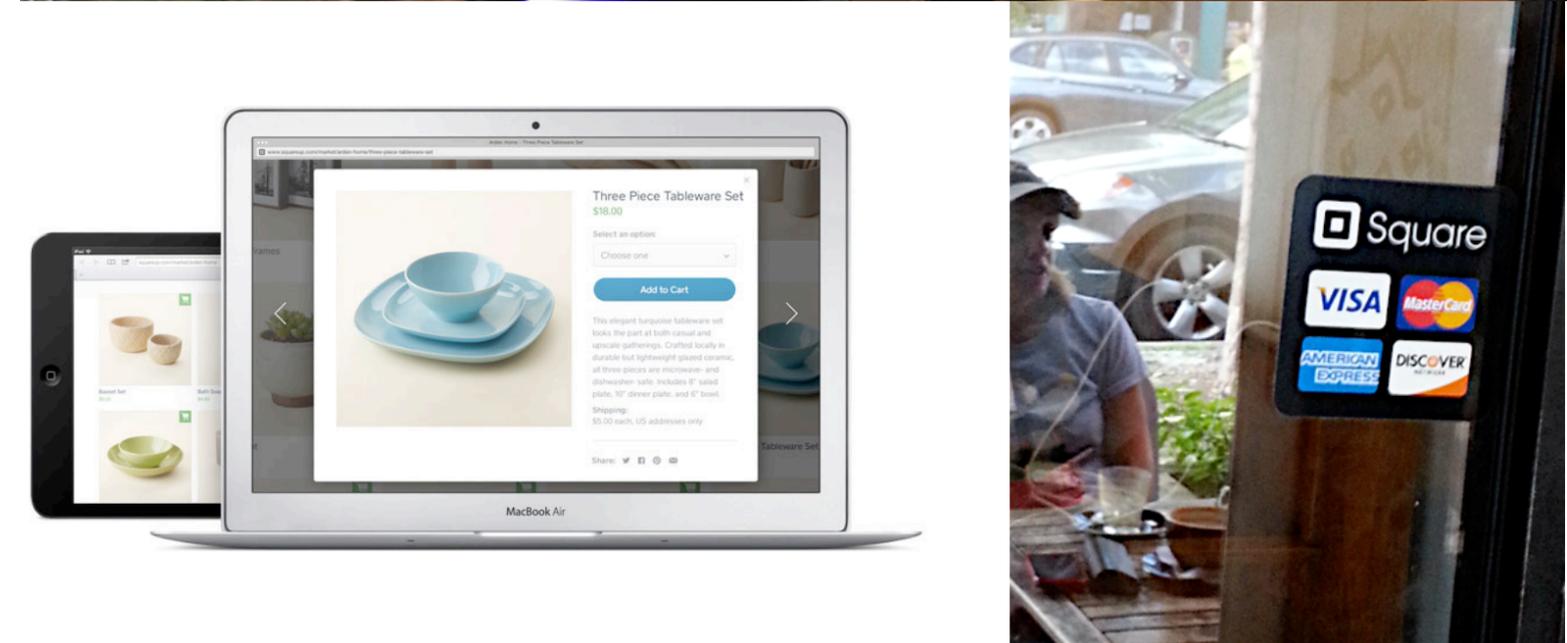
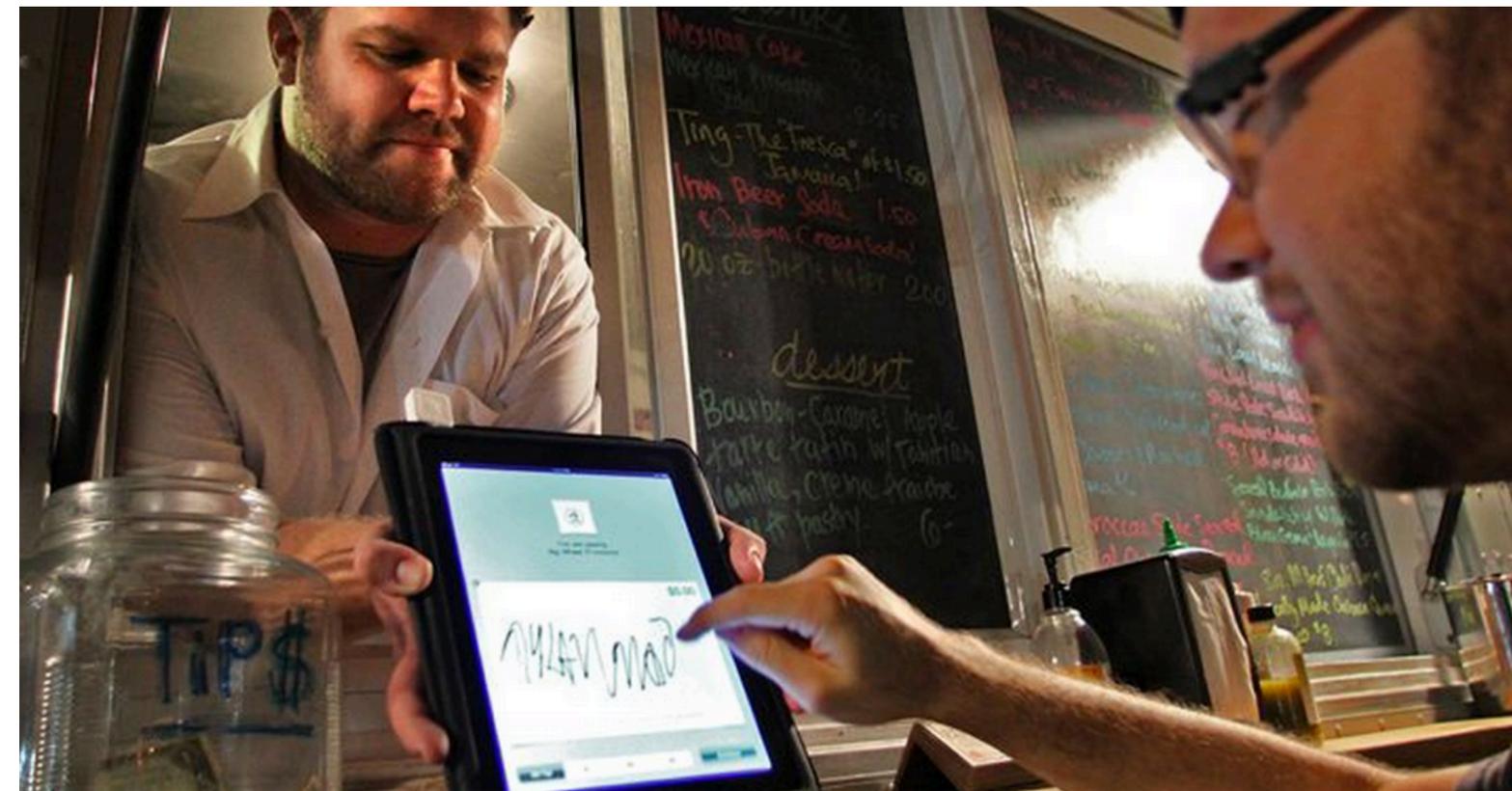
+ leverage towards media partners*

no leverage generated
towards Google family services*

iTunes in Starbucks



Square



iTunes in Starbucks

Square

organized service delivery* forms an experience

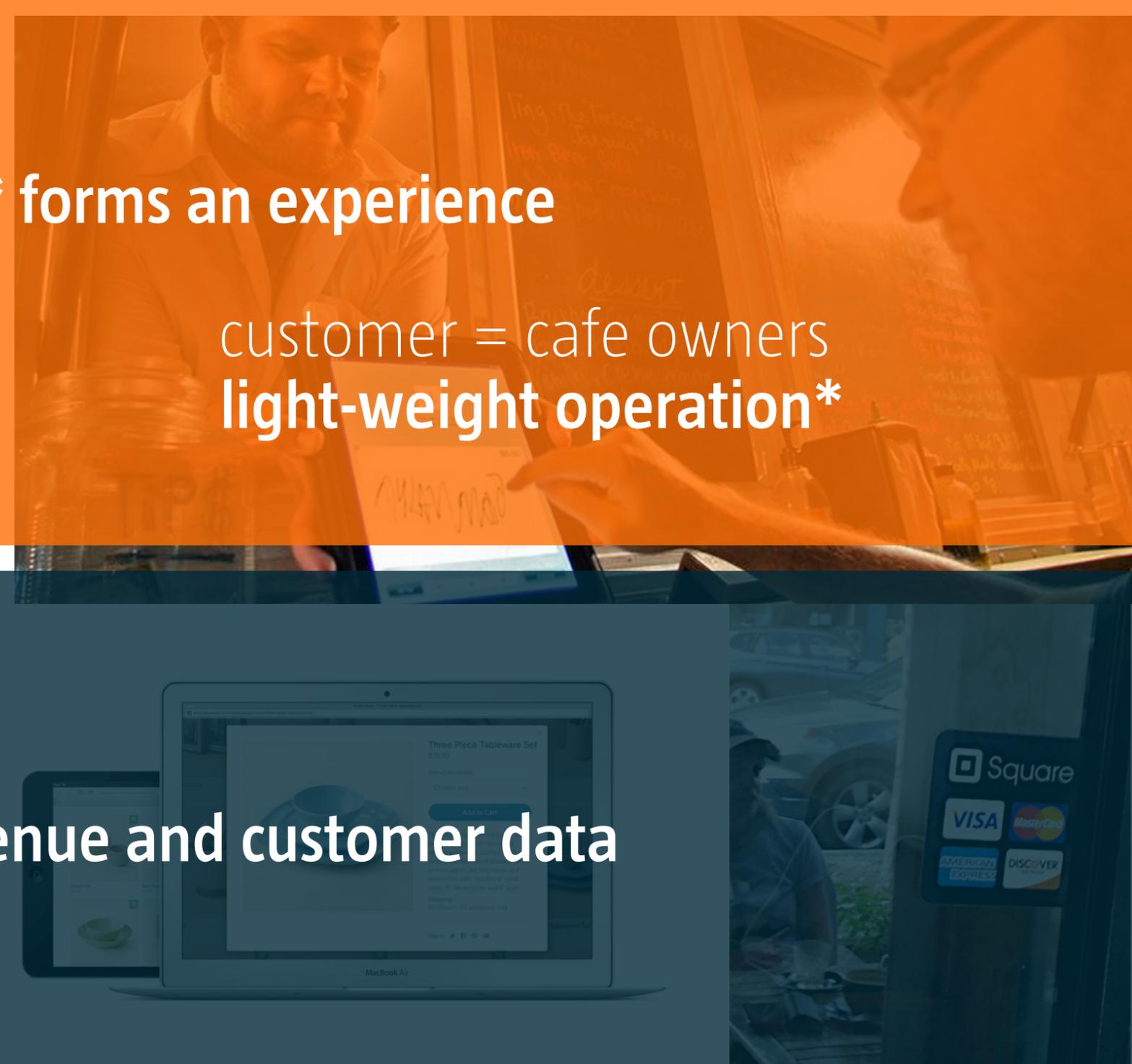
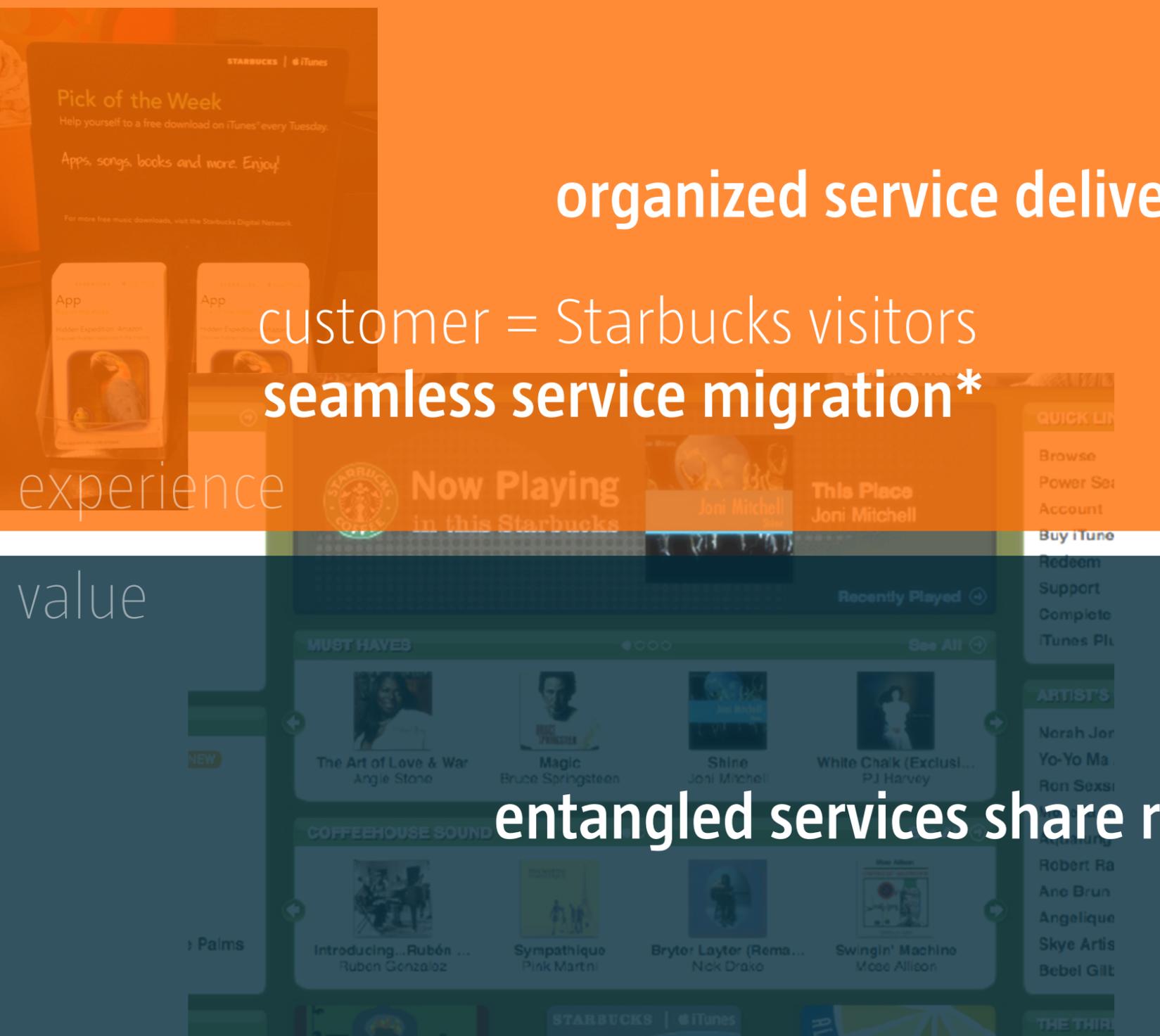
customer = Starbucks visitors
seamless service migration*

customer = cafe owners
light-weight operation*

experience

value

entangled services share revenue and customer data



Exploring typology of Services Entanglements: systems perspective

– how entangled service systems get codependent each other?

what are the leading and supporting constituents of co-dependent relationship?

how co-produced value is distributed across the constituents?

density of relationships? [single, handful, plenty of]

openness of connections? [unique, limited, unlimited, inscrutable]

– how entangled service systems' experience are orchestrated?

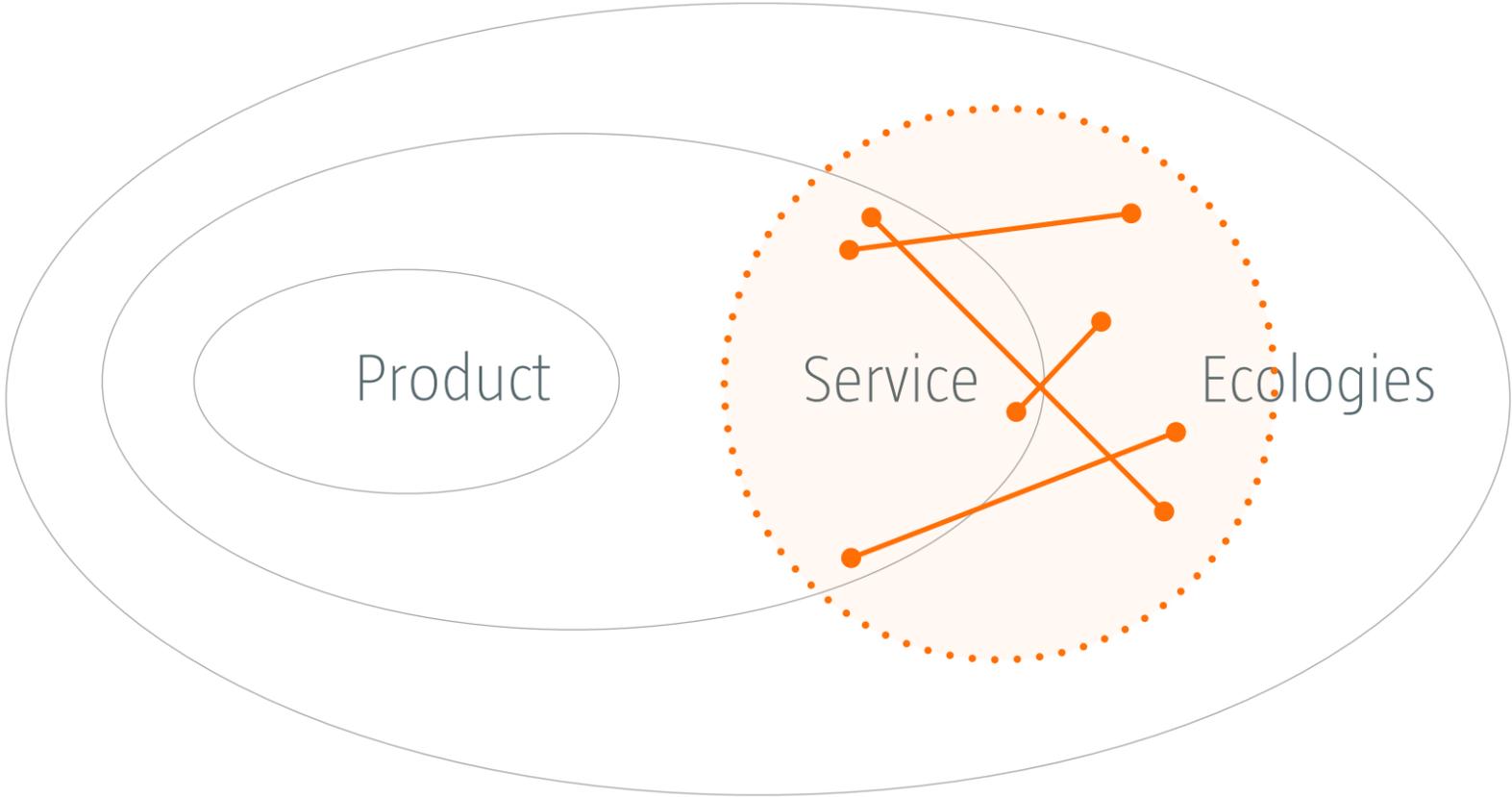
who are the stakeholders of designing the intersections of systems?

how are project and task ownerships distributed across the stakeholders?

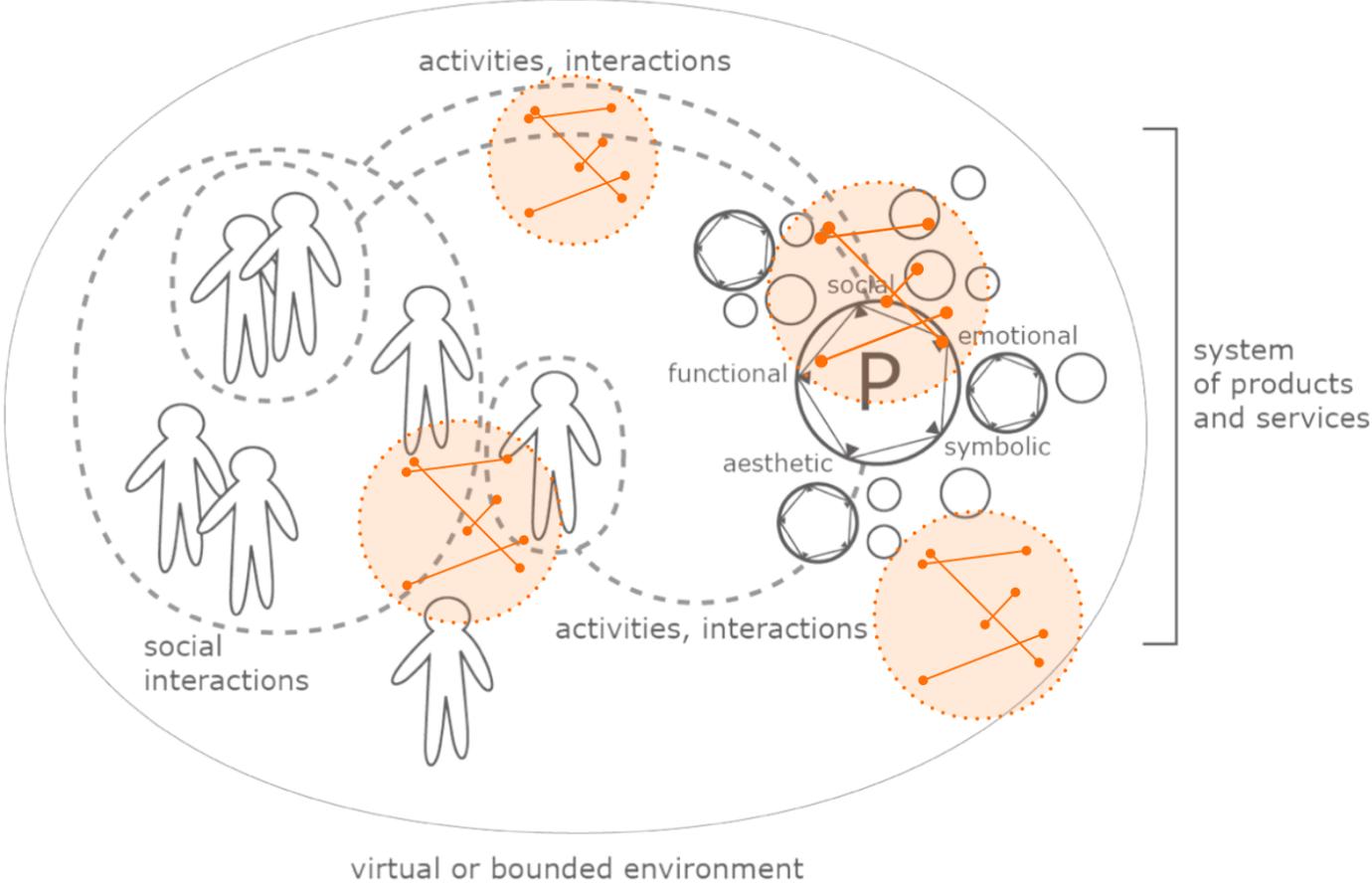
what are the barriers of interfacing, layering and polishing systems intersection?

: from unexplored mess towards organized complexity

Why Service Entanglement is helpful: thinking



model by Hugh Dubberly (2013)

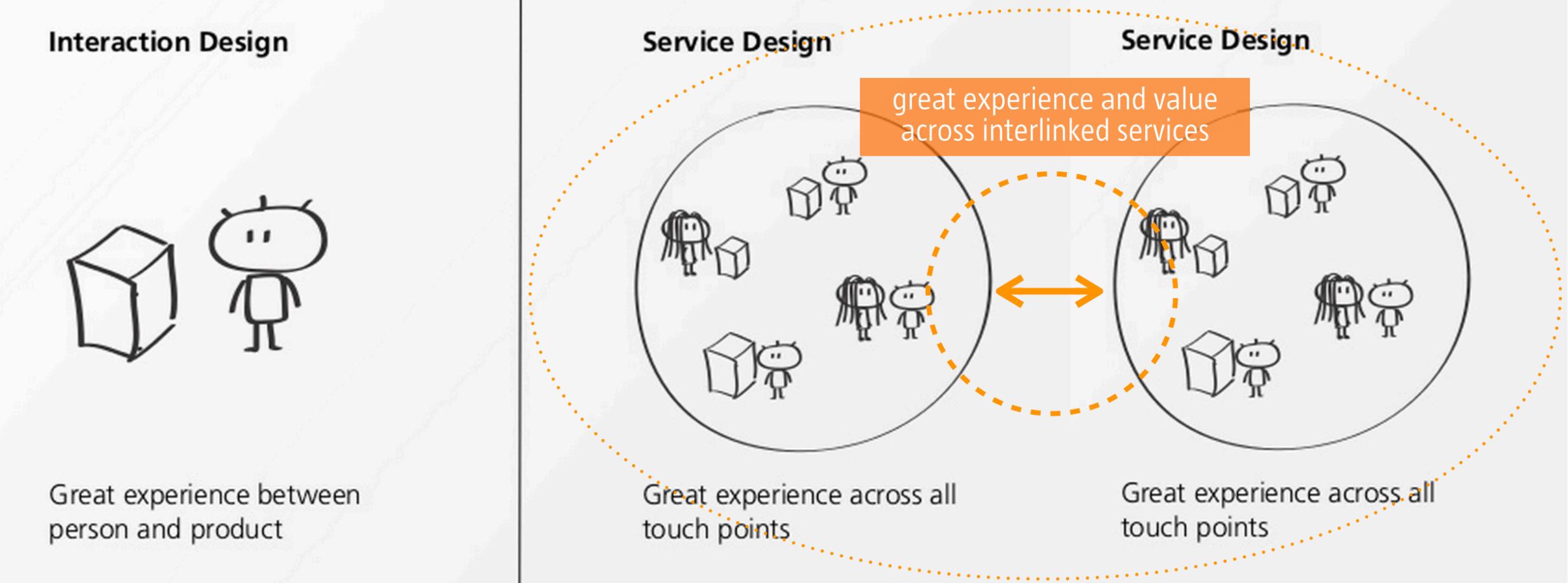


Product Service Ecology (Jodi Forlizzi, 2013)

Why Service Entanglement is helpful: practice

Services now create experience and value in more complex way than a single product or service system does.

Current Interaction and Service Design practice and research do not really focus at multiple service/business entities interrelations



Service Design – Interaction Design Perspective, Jamin Hegemen, Adaptive Path, 2011

What Service Entanglement aims to

- 1. Service Entanglement helps concrete understanding on Service Ecology:** as a world-view
- 2. Service Entanglement provides a point of view to assess current landscape of service ecology to refine more actionable insights:** as an approach for better problem solving*
- 3. Service Entanglement can inspire designers to think of meaningful codependencies in new service creation and development:** as an approach for problem seeking + perturbation*

Discussions

Systemic perspective of Interaction Design

- How Interaction Design researches and practices can tackle problems results from Service Entanglement?
- How Interaction Design researches and practices can contribute to creating a fruitful Service Entanglement?

Systemic perspective of Service Design

- What are the missing links in current Service Design researches and practices?
- How Service Design researches and practices can contribute to creating a fruitful Service Entanglement?

Design perspective of Service Business Strategy

- How the concept of Service Entanglement can help formulating service business strategies creating meaningful co-dependency?
- How the concept of Service Entanglement can help formulating sustainable service business model?

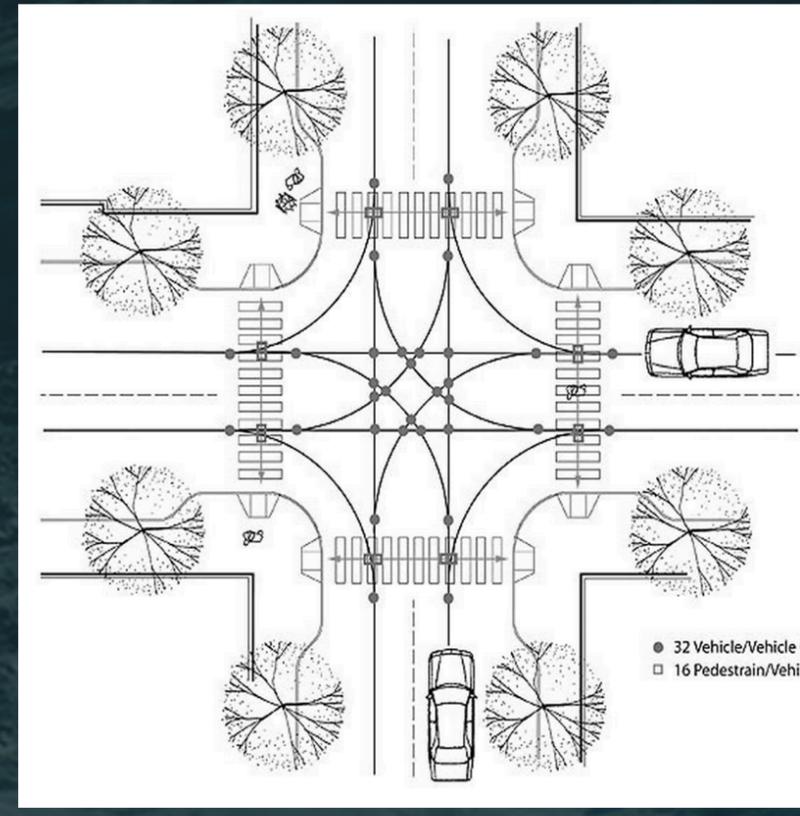
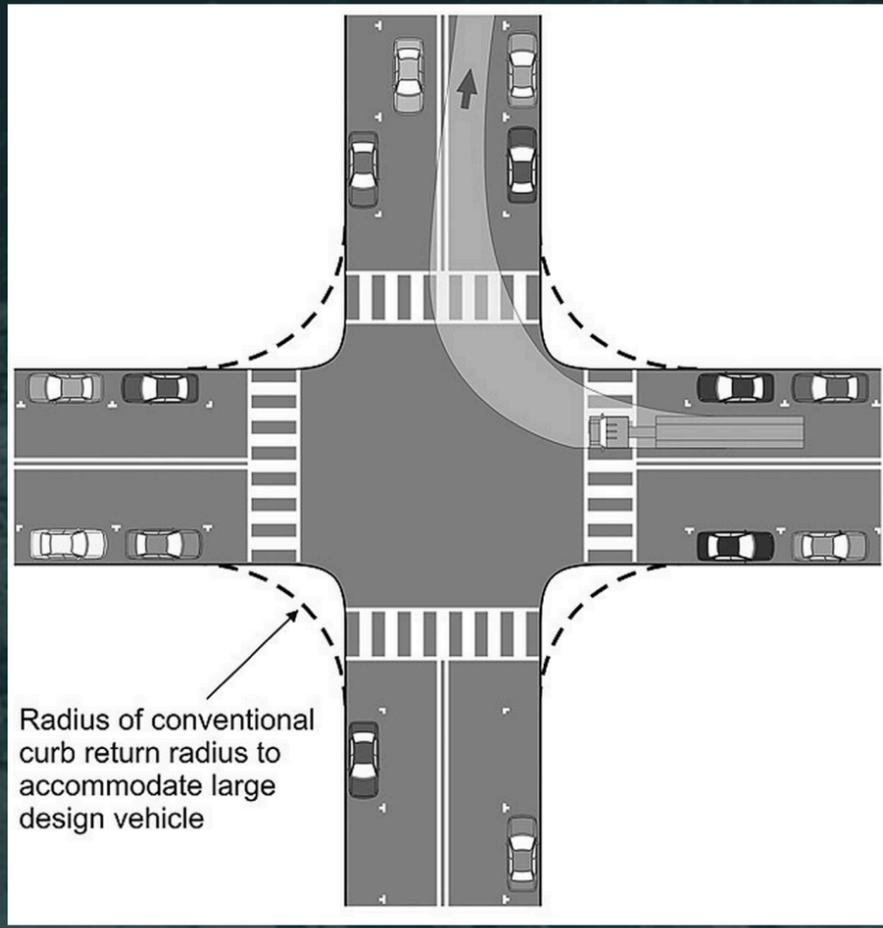
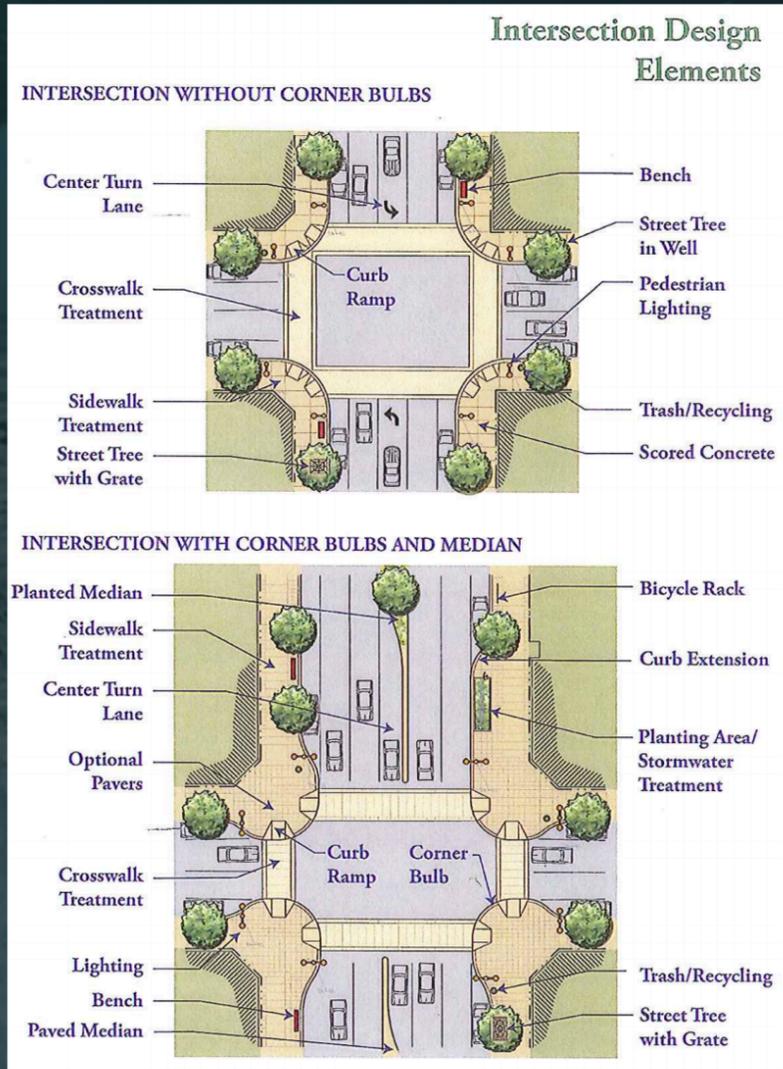
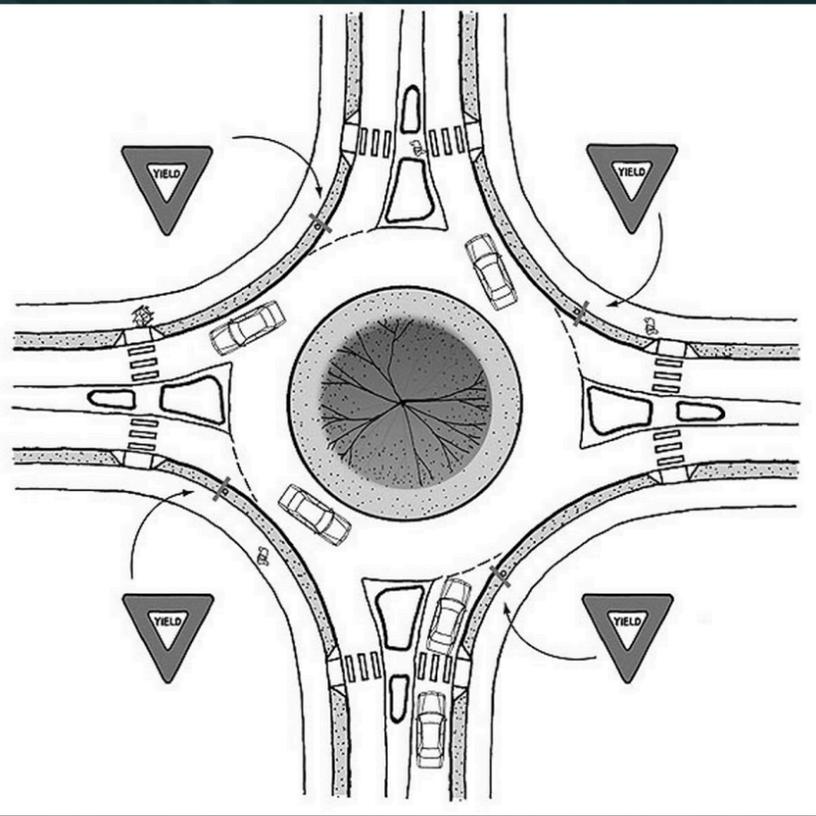
Design perspective of Service Management, Marketing and Evolution

- How the concept of Service Entanglement can help managing and marketing a service system?
- How the concept of Service Entanglement can help making an evolution of a service system more effectively and efficiently?

Service perspective of understanding Design (from The Design Way, 2nd edition)

- **How the study of Service Entanglement can advance discussion of Service Element in Design concept?**
- **If designers are not totally in service relationship, what would it be the proper description of it?**
(ex. designers creating an application service using open APIs from a certain system)

Closing metaphor (1) Intersection Design at Urban Planning



Closing metaphor (2) Entanglement in Quantum Physics (and human relationships)

Quantum entanglement is kind of romantic.
Two particles with an entangled fate,
no matter the distance between them...



Yet the mystery of their fate is necessary.
When you determine the value of one of them,
the wavefunction collapses and entanglement ends.



Do you love me?



Is there a right answer
to this question?



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