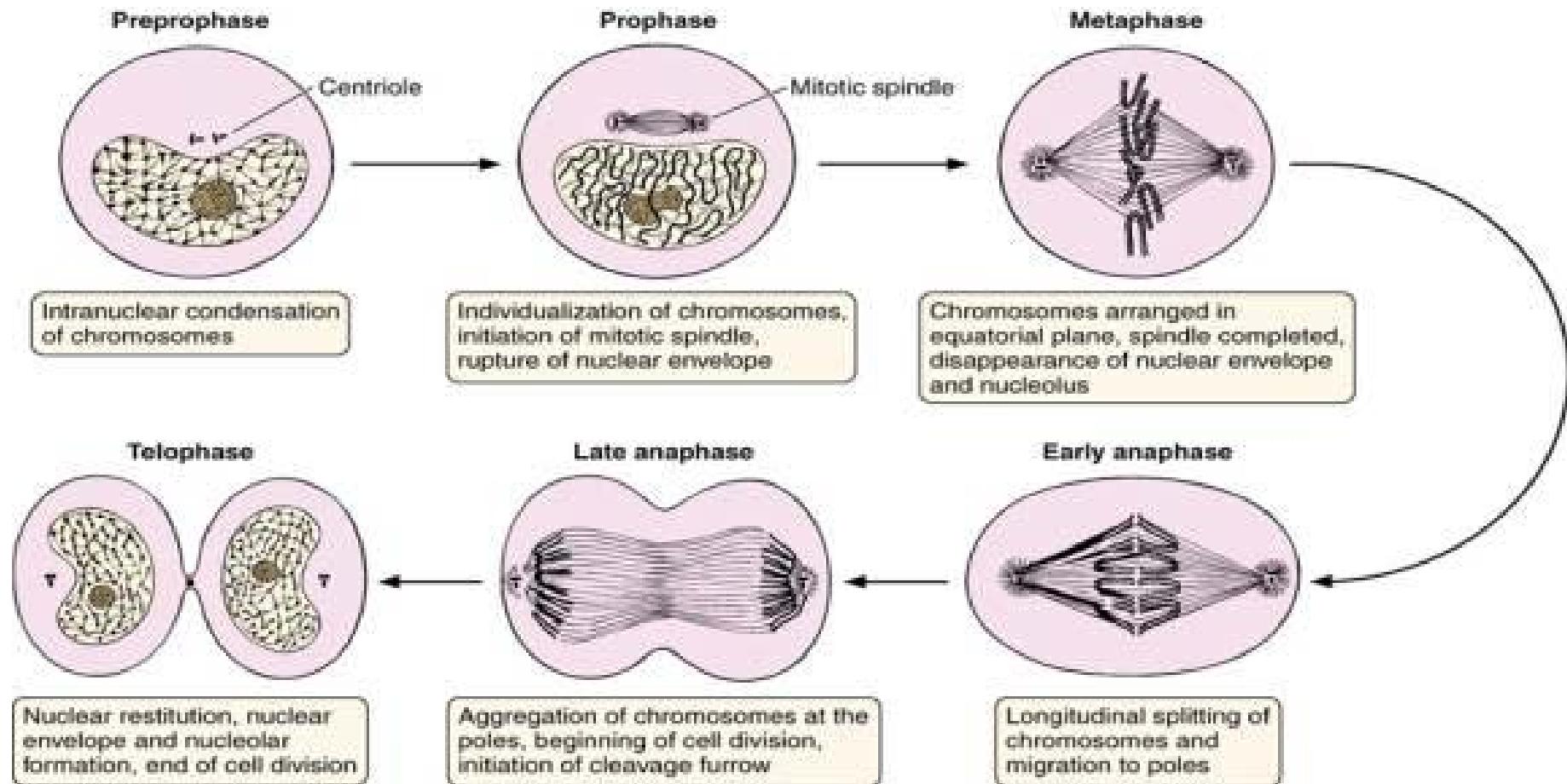


# Die Datenwelt von Morgen

Barry Smith

ZiF, October 25, 2016

# Old biology data



# New biology data

MKVSDRRKFEKANFDEFESALNNKNDLVHCPSITLFESIPTEVRSF  
YEDEKSGLIKVVKFRTGAMDRKRSFEKVVVISVMVGKNVKKFLTFV  
EDEPDFQGGPISKYLIPKKINLMVYTLFQVHTLKFNRKDYDTLSLF  
YLNRGYYNELSFRVLERCHEIASARPNDSSSTMRTFTDFVSGAPIV  
RSLQKSTIRKYGYNLAPYMFLHVDELSIFSAYQASLPGEKKVDT  
ERLKRDLCPRKPIEIKYFSQICNDMMNKKDRLGDLHIIILRACALNF  
GAGPRGGAGDEEDRSITNEEPIIPSVDEHGLKVCKLRSPNTPRRL  
RKTLDAVKALLVSSCACTARDLDIFDDNNGVAMWKWIKILYHEVA  
QETTLKDSYRITLVPSSDGISLLAFAGPQRNVYVDDTRRIQLYTD  
YNKNGSSEPRLKTLGGLTSDYVFYFVTVLRQMICALGNSYDAFN  
HDPWMDVVGfedPNQVTNRDISRIVLYSYMFLNTAKGCLVEYAT  
FRQYMRELPKNAPQKLNREMREQGLIALGRHCVGSRFETDLYES  
ATSELMANHSVQTGRNIYGVDFSLTSVSGTTATLLQERASERWIQ  
WLGLESDYHCSFSSTRNAEDVDISRIVLYSYMFLNTAKGCLVEYA  
TFRQYMRELPKNAPQKLNREMREQGLIALGRHCVGSRFETDLYE  
SATSELMANHSVQTGRNIYGVDFSLTSVSGTTATLLQERASERW<sup>4</sup>I

# How to do biology across the genome?

MKVSDRRKFEKANFDEFESALNNKNDLVHCPAITFESIPTEVRSFYEDEKSGLIKVVKFRGAMDRKRSFEKVVIS  
VMVGKNKKFLTFVEDEPDFQGGPISKYLIPKKINLMVYTLFQVHTLKFNRKDYDTLSLFYLNRGYYNELSFRVLER  
CHEIASARPNDSSSTMRTFTDFVSGAPIVRSLQKSTIRKYGYNLAPYMFLLLHVDELSIFSAYQASLPGEKKVDTERL  
KRDLCPRKPIEKYFSQICNDMMNKKDRLGDILHIILRACALNFGAGPRGGAGDEEDRSITNEEPIPSVDEHGLKVC  
KLRSPNTPRRLRKTLDAVKALLVSSCACTARDLDIFDDNNGVAMWKWIKILYHEVAQETTLKDSYRITLVPSSDGIS  
LLAFAGPQRNVYVDDTRRIQLYTDYNKNGSSEPRLKTLGLTSYVFYFVTVLRQMQLCALGNSYDAFNHDPWM  
DVVGFEDPNQVTNRDISRIVLYSYMFLNTAKGCLVEYATFRQYMRELPKNAPQKLNFRMRQGLIALGRHCVGSR  
FETDLYESATSELMANHSVQTGRNIYGVDFLSLTSVSGTTATLLQERASERWIQWLGLESDYHCSFSSTRNAEDVM  
KVSDRRKFEKANFDEFESALNNKNDLVHCPAITFESIPTEVRSFYEDEKSGLIKVVKFRGAMDRKRSFEKVVISV  
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HEIASARPNDSSSTMRTFTDFVSGAPIVRSLQKSTIRKYGYNLAPYMFLLLHVDELSIFSAYQASLPGEKKVDTERLK  
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LRSPNTPRRLRKTLDAVKALLVSSCACTARDLDIFDDNNGVAMWKWIKILYHEVAQETTLKDSYRITLVPSSDGISLL  
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VSDRRKFEKANFDEFESALNNKNDLVHCPAITFESIPTEVRSFYEDEKSGLIKVVKFRGAMDRKRSFEKVVISVM  
VGKNKKFLTFVEDEPDFQGGPISKYLIPKKINLMVYTLFQVHTLKFNRKDYDTLSLFYLNRGYYNELSFRVLERCH  
EIASARPNDSSSTMRTFTDFVSGAPIVRSLQKSTIRKYGYNLAPYMFLLLHVDELSIFSAYQASLPGEKKVDTERLKR  
DLCPRKPIEKYFSQICNDMMNKKDRLGDILHIILRACALNFGAGPRGGAGDEEDRSITNEEPIPSVDEHGLKVC  
RSPNTPRRLRKTLDAVKALLVSSCACTARDLDIFDDNNGVAMWKWIKILYHEVAQETTLKDSYRITLVPSSDGISLL  
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VSDRRKFEKANFDEFESALNNKNDLVHCPAITFESIPTEVRSFYEDEKSGLIKVVKFRGAMDRKRSFEKVVISVM  
VGKNKKFLTFVEDEPDFQGGPISKYLIPKKINLMVYTLFQVHTLKFNRKDYDTLSLFYLNRGYYNELSFRVLERCH<sub>5</sub>  
EIASARPNDSSSTMRTFTDFVSGAPIVRSLQKSTIRKYGYNLAPYMFLLLHVDELSIFSAYQASLPGEKKVDTERLKR

how to link the kinds of phenomena  
represented here



to data  
like  
these?

to data  
like  
these?

ALNNKNDLVHCPSITLFESIPTEVRSFYEDEKSGLIKVVKFRTGAMDRK  
-LTFVEDEPDFQGGPIPSKYLIPKKINLMVYTLFQVHTLKFRNRKDYDTSL  
RCHEIASARPNDSSSTMRTFTDFVSGAPIVRSLQKSTIRKYGYNLAPYMFLLI  
SEKKVDTERLKRDLCPRKPIEIKYFSQICNDMMNKKDRLGDILHILRACALNF  
ASITNEEPIPSVDEHGLKVCKLRSNTPRRLRKTLDAVKALLVSSCACTARDLD  
VIKILYHEVAQETTLKDSYRITLPSSDGISLLAFAGPQRNVYVDDTRRIQLYTDY  
LDGLTSDYVFYFVTVLRQMQLCALGNSYDAFNHD PWMDVVG FEDPNQVTNRDIS  
AKGCLVEYATFRQYMREL PKNAPQKLNREM RQGLIALGRHCVGSRFETDL YESA  
QTGRNIYGVDSFSLTSGTTATLLQERASERWIQWLGLES DYHCSFSSTRNAEDVV  
HHQKISR VTRKRPREP KSTNDILVAGQKLFGSSFEFRDLHQLRLCYEIYMA DTPSVA VQA  
ELFHLPLIALASKGDVEYVSFLFV PYTVLLANC MIRLGRRGCLNVAPVRNFIEEGYDGVTDL  
PLASTNFTDRIA AWENIV ECTFRTNNVKG YLIVDEFHN FETEVYRQS QFG GITNL DFDA FEK  
TAPEAVADA ALQRIG LTGLAKKSMDIN ELKRSE DLSRG LSSY PTRMF NLIKE KSEVPLGHVHK  
ESQPEEALKLLL ALFESE PESKA IVVASTTNE VEELAC SWRKYFRV VWIHGKLGA AEKV SRTKE  
DGSMQVLIGTKL VTEGIDIKQLMMVIMLDNRLNII E LIQGVG RLRDGGLCYLLSRKNSWAARNRKG  
PPKEGCITEQVREFY GLESKKGKKQHVGCCSRTDLSADTV EIERMDRLAEKQ ATASMSIVAL  
PSSFQESNSSDRYRKYC SSED SNTCI HGSANASTNASTNA ITTASTN VRTNATTNASTNATTNASTN  
ASTNATTNASTNATTNSSTNATTASTN VRTSATTASINVRTSATTTESTNSSTNATTTESTNSSTNA  
TTTESTNSNTSATTASINVRTSATTTESTNSSTSATTASINVRTSATTKSINSSTNATTTESTNSNT  
NATTTESTNSSTNATTTESTNSSTNATTTESTNSNTSAATTESTNSNTSATTTESTNASAKEDANKDG  
NAEDNRFHPVTDINKESYKRKGSQMVLLE RKKLKAQFPNTSEN MNVLQFLGFRSDEIKHFLYGI DIYF  
CPEGVFTQYGLCKGCQKM FELCVCWAGQKV SYRRIAWEAL AVERMLRNDEEYKEYLEDIEPYHGDF  
VGYLKYFSVKRREIYSQIQ RNYAWYLAITRRRETISVLDSTRGKQGSQVFRMSG RQIKELYFKVWSNL  
RESKTEVLQYFLN WDEKKCQEEWEAKDDTV VVEALEKGGVFQRLRSMTSAGLQGPQYVKLQFSRH  
HRQLRSRYELSLGMH LRDQIALGVTPSKVPHWT AFLSMLIGLFYNKTFRQKLEYLLEQ ISEVWL PHW  
LDLANVEVLAADDTRVPL YMLMVA VHKE LDSSDVPDGRFDILLCRDSSREV GELIGLFYNKTFRQKLE  
YLLEQ ISEVWL PHWL DLANVEVLAADDTRVPL YMLMVA VHKE LDSSDVPDGRFDILLCRDSSREV G  
ELIGLFYNKTFRQKLEYLLEQ ISEVWL PHWL DLANVEVLAADDTRVPL YMLMVA VHKE LDSSDVPD

# Answer

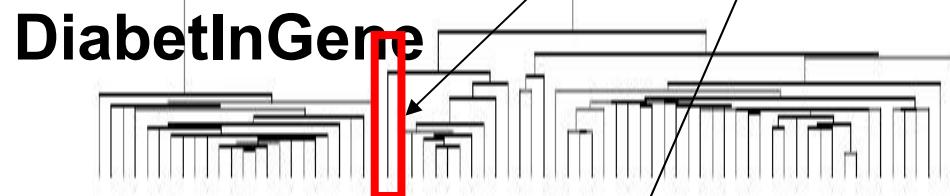
Create an ontology: a controlled logically structured consensus classification of the types of entities in the relevant domain

scientists in the domain use the same ontology aggressively to tag their data

# tagging with common ontologies allows navigation between databases

## MouseEcotope

Tool	Statistical model	Correction for multiple comparisons	OO Visualization	Microarrays supported	Time to process 200 genes (s)
Ome-Express	$\chi^2$ , binomial, hypergeometric, Fisher's exact test	Silta, Holm, Benferroni, FDR	Flat, Tree	172 commercial arrays (Affymetrix, Sigma-Array, Sigma-Diagnostic, ClonTech, PerkinElmer, Operon, Teksar, NEAI), can also upload a user-defined list	7, 8, 16, 28
GolmBase	Fisher's exact test	Relative enrichment	Tree, DAG	Uploads from user Not applicable	77, 123, 223, 340
DAVID	None	None	Not available	27 arrays (Affymetrix only); can also upload a user-defined list	15, 17, 27, 54
EASEonline	Fisher's exact test	Benferroni	Not available	15, 19, 34, 54	
GeneSig	Hypergeometric	Benferroni	Flat, no hierarchical structure	Uploads from user	6, 6, 6, 8
PathAssociate	Fisher's exact test	None	Not available	Uploads from user: Tree	22, 27, 28, 39
GOterm	Hypergeometric	None	Not available	37 arrays (Affymetrix only); uploads from user	39, 90, 137,
FunGO	Percentage	Step-down minP, FDR (Bogdanov and Hochberg, 1995), FDR (Bogdanov and Yekutieli, 2001)	Flat, Tree	Uploads from user	15, 46, 68, 195
CLENCH	Hypergeometric, $\chi^2$ , binomial	None	DAG	Uploads from user	NA
GOstat	$\chi^2$ , Fisher's exact test	FDR, Holm	Not available	Uploads from user	12, 20, 48, 81
GOstatBox	Hypergeometric, binomial, Fisher's exact test	Benferroni, FDR	Not available	Uploads from user	22, 81, 145, 171
PathoG	$\chi^2$	None	DAG	Uploads from user	3, 3, 3, 4
Oncology Testress	Hypergeometric	FDR	Not available	5 arrays (Affymetrix); uploads from user	NA
eGOn	Binomial	None	Tree	Uploads from user	30, 45, 88, 85



## GluChem



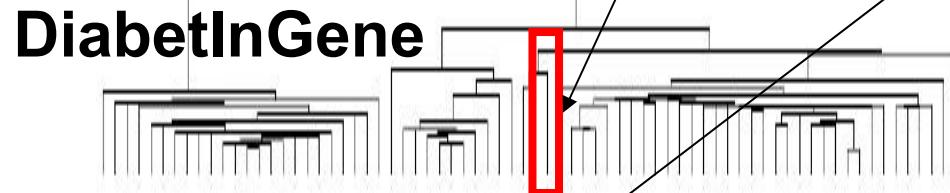
## GlyProt

<b>ECU Glutamate-ammonia ligase</b>
<b>ECO2 Beta oxygenase (decycling) 1</b>
<b>EMBL-3 Nucleoprotein, Abnl-3</b>
<b>Erythrocyte membrane 57kd glycoprotein</b>
<b>CAS Calcium-binding II</b>
<b>MEK Nuclear factor 1/2</b>
<b>NONMEM PROTEIN MN-45</b>
<b>Homocysteine Protein CS, Class I</b>
<b>KIAA0466 gene, partial cds</b>
<b>ML22 Elastase 2, neutrophil</b>
<b>M60 Myeloperoxidase</b>
<b>CM33 Cystatin C</b>
<b>M606 Bar homolog, number 6 (rho 0)</b>
<b>M61 Annexin I (lipocortin 1)</b>
<b>CM39</b>
<b>M62 Integrating smoothening</b>
<b>I component of complement</b>
<b>GP-115-beta</b>
<b>NONMEM PROTEIN MN-45</b>
<b>M63 Alpha mannosidase II enzyme</b>
<b>Non-specific</b>
<b>Neurogigin suppression-of-white-apoptot</b>
<b>CD2 antigen (CD5)</b>
<b>Protein V11A (V11E2)</b>
<b>SPN18 Small proline-rich protein 1B</b>
<b>M672 Actinin alpha 2</b>
<b>KIAA0466 gene, partial cds</b>
<b>DPH Decoytripartite kinase</b>
<b>Carcinoembryonic antigen precursor</b>
<b>LTH Lysozyme-like beta</b>
<b>M632 GATA-binding protein 3</b>
<b>M6 CF = Escherichia coli usher</b>
<b>NONMEM PROTEIN MN-45</b>
<b>Spinal Muscular Atrophy 4</b>
<b>KIAA0466 gene, partial cds</b>
<b>Myoepithelia (MPP)</b>
<b>M6-encoded proteinase LAMP7-ct</b>
<b>M61 Replication protein A1</b>
<b>Cleav 22 nRNA</b>
<b>CNTG CNT synthetase</b>
<b>NONMEM PROTEIN MN-45</b>
<b>M61 mRNA</b>
<b>M60 calcium-binding protein MN-45</b>
<b>M6 Protein-tyrosine kinase hlt</b>
<b>CBP (CBP)</b>
<b>M6-1</b>
<b>M61</b>
<b>M6 antigen</b>
<b>Skeletal muscle abundant protein</b>

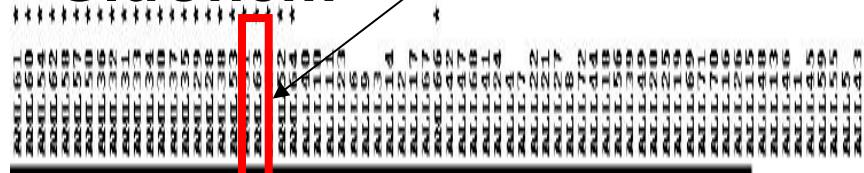
the data involved, and the scientists collecting and using these data, are thereby linked together in a gigantic network

Tool	Statistical model	Correction for multiple comparisons	OO Visualization	Microarrays supported	Time to process 200 genes (s)
Ome-Express	$\chi^2$ , binomial, hypergeometric, Fisher's exact test	Sidak, Holm, Bonferroni, FDR	Flat, Tree	172 commercial arrays (Affymetrix, Sigma-Array, Sigma-Diagnostic, ClonTech, PerkinElmer, Operon, Teksar, NEAI) can also upload a user-defined file	7, 8, 16, 28
Golmics	Fisher's exact test	Relative enrichment	Tree, DAG	Uploads from user	77, 123, 223, 40
DAVID	None	None	Not available	Not applicable	15, 17, 27, 54
EASEonline	Fisher's exact test	Bonferroni	Not available	27 arrays (Affymetrix only); can also upload a user-defined file	15, 19, 34, 74
GeneMerge	Hypergeometric	Bootstrapping	Flat, no hierarchical structure	Uploads from user	6, 6, 6, 8
PathAssociate	Fisher's exact test	None	Not available	Tree	22, 27, 28, 39
GOTM	Hypergeometric	None	Not available	37 arrays (Affymetrix only); uploads from user	39, 90, 137,
FunGO	Percentage	Step-down minP, FDR (Burgmann and Hochberg, 1995), FDR (Burgmann and Yekutieli, 2001)	Flat, Tree	Uploads from user	15, 46, 68, 195
CLENCH	Hypergeometric, $\chi^2$ , binomial	None	DAG	Uploads from user	NA
GOstat	$\chi^2$ , Fisher's exact test	FDR, Holm	Not available	Uploads from user	12, 20, 48, 89
GOtoBIKE	Hypergeometric, binomial, Fisher's exact test	Bootstrapping, Holm, Hochberg,侯氏, FDR, p-value	Not available	Uploads from user	22, 81, 145, 279
Orderer	$\chi^2$	—	DAG	22 arrays (Affymetrix only); uploads from user	2, 2, 2, 5
Ontology Trainer	Hypergeometric	FDR	Not available	5 arrays (Affymetrix); uploads from user	NA
eGCG	Binomial	None	Tree	Uploads from user	30, 45, 88, 85

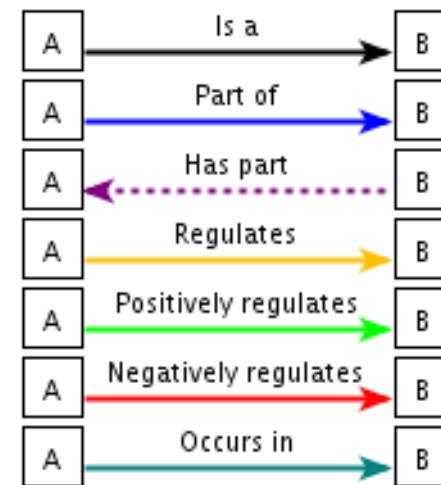
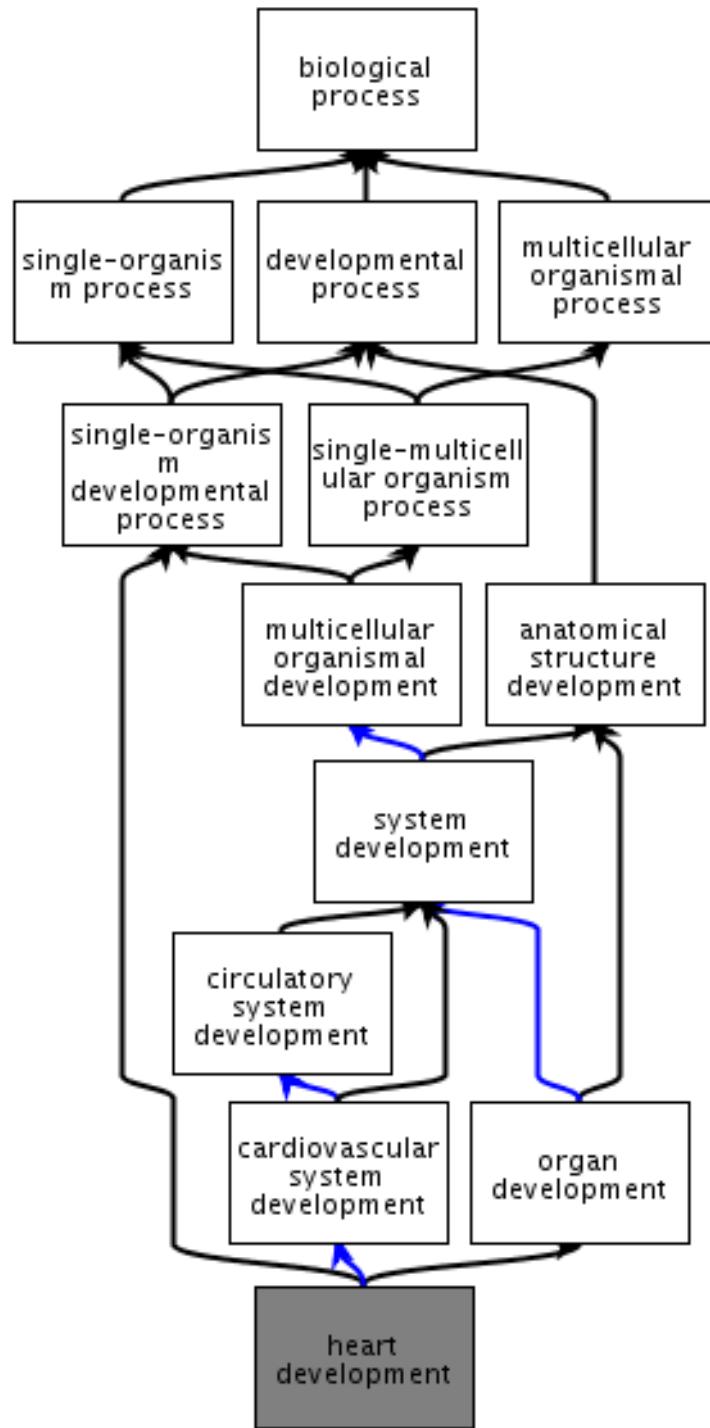
*Holliday junction*  
*helicase complex*



**GluChem**

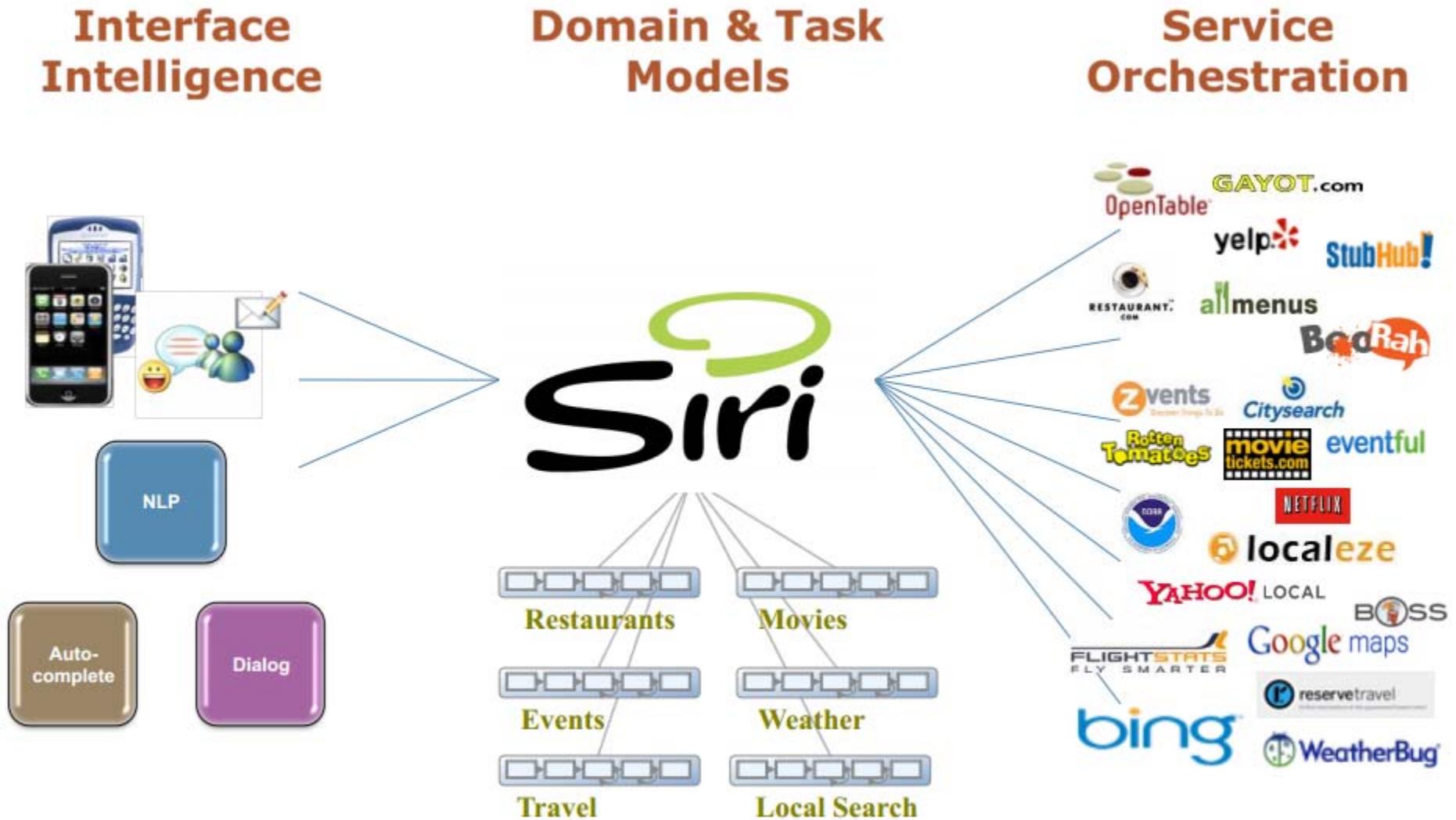


E2L Glutamate-gamma ligase  
 E2P2 Beta oxygenase (decreased) 2  
 E2R-N Nucleoprotein, Abnl-3  
 Erythrocyte membrane 57kd glycoprotein  
 EAS Carbocyclic antibiotic II  
 ECAK Nuclear factor 1/T  
 ENTHOM PROTEIN MN-45  
 Ensembl Protein CS, Class I  
 EIAAM26 gene, partial cds  
 EIA2 Elastase 2, neutrophil  
 EI2 Hyalopeptidase  
 EI3 Crystallin C  
 EI56 Bar homolog, number 5 (rho 0)  
 EI61 Annexin I (lipocortin 1)  
 EI62  
 EI63 Integration nuclease  
 EI component of complement  
 EI-115-beta  
 EI-116-locus  
 EI-117-locus  
 EI-118 Alpha amylase II isozyme  
 EI-119 Isocitrate  
 EI-120 Suppressor-of-white-sprout  
 EI-121 antigen (5D)  
 EI-122 antigen  
 EI-123 antigen  
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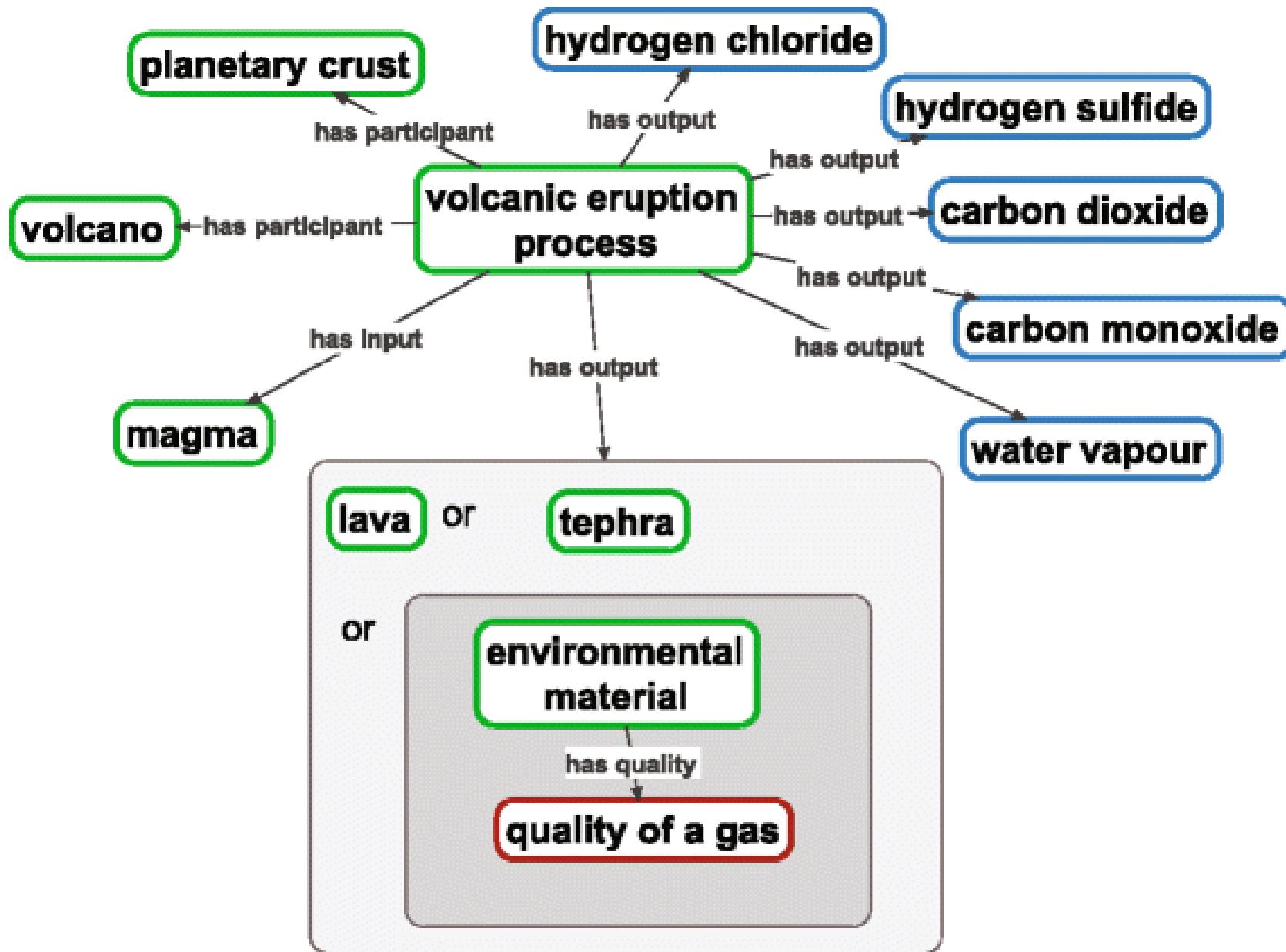


## The Gene Ontology (fragment)

# “Siri: An Ontology-driven Application for the Masses”, Adam Cheyer and Tom Gruber



# ENVO: The Environment Ontology





**United Nations Environment Programme**  
environment for development



Climate  
Change



Disas-  
& Con-

**UNEP Li|ve**

**SDG Synergies**

Or

# SDG Synergies

SDGs

MEAs

Synergies

Ontologies

# Sustainable Development Goals

# JJ. Gibson (1904-1979)



*The Ecological Approach to Visual Perception*, Boston, 1975

*Wahrnehmung und Umwelt:  
der ökologische Ansatz in  
der visuellen Wahrnehmung*,  
München, 1982

# Gibson: Environments comprehend systems of affordances

affordance = **Angebotscharakter**  
(auch **Aufforderungscharakter**  
oder **Affordanz**)

# affordances

“The affordances of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or evil.”

a glass of beer *affords drinking*

a chair *affords sitting*

a step *affords climbing*

a chin (in the boxing ring) *affords hitting*

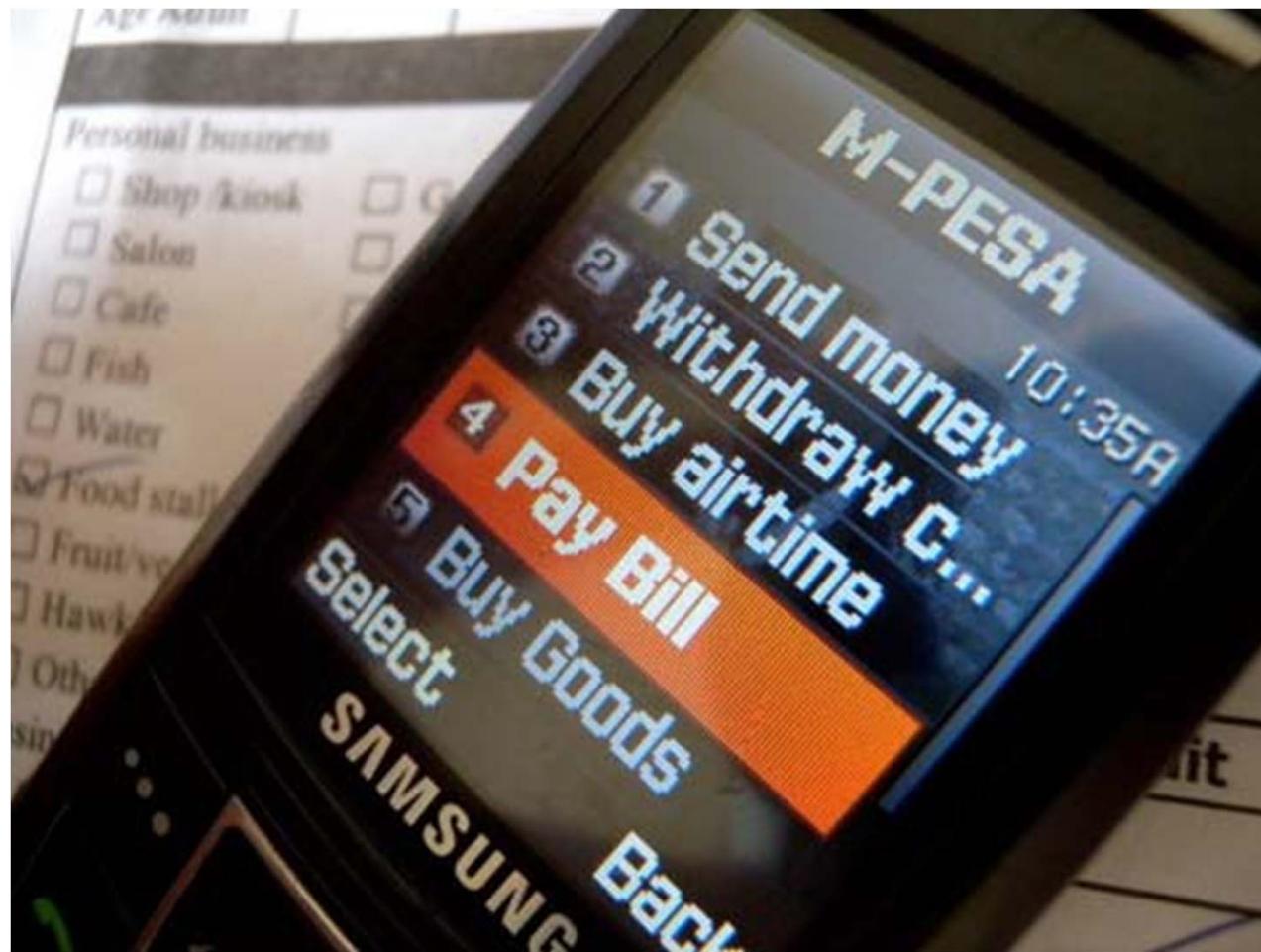
a checkbox (*Ankreuzfeld*) *affords checking*

a mobile phone *affords texting*

# Einstimmung

- **Entwicklung:** organisms evolved to fit into environments with these and those systems of affordances
- **Bildung:** for cultural organisms like human beings, we become tuned to the corresponding affordances through training, drill, learning, ...
  - Cultural learning cumulates – leading to ever more complex environments

a mobile phone *affords banking*



a mobile phone *affords mating*

A photograph of a group of people at a party, with a colorful piñata in the foreground. The text "tinder social" is overlaid in large white letters, and the question "What are you doing tonight?" is below it. Two download buttons are at the bottom: "Download on the App Store" and "Get it on Google Play".

tinder social

What are you doing tonight?

Download on the  
App Store

Get it on  
Google Play

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# a mobile phone *changes family life*



# Digitale Umwelten

**new environments, with new kinds of affordances, through which *people* are being changed in new kinds of ways**

# **People of old were nodes**

- in biological networks
- in friendship networks
- in workplace networks ...

These networks were held together by face-to-face interactions which run at human speed and have a short half life

The consequences of single interactions rarely cumulated in such a way as to have wider ranging effects

**Today everything is different**

**Today everything is different**



**Das Unternehmen**

Firmenkunden

Privatkunden

**schufa**

Wir schaffen Vertrauen

Unternehmen

Wissenswertes

Verantwortung

Produkte

Presse

Karriere



Suchen



Sie befinden sich hier: Presse > Basisinformationen > SCHUFA macht Kredit möglich

► Basisinformationen

► Die SCHUFA & Ich

## **SCHUFA macht Kredit möglich**

**Das Unternehmen**

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→ Basisinformationen

→ Die SCHUFA & Ich

## **SCHUFA macht Kredit möglich**

**... by shaping humans**

Das Unternehmen

Firmenkunden

Privatkunden

**schufa**

Wir schaffen Vertrauen

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Produkte

Presse

Karriere



Suchen



Sie befinden sich hier: Presse > Basisinformationen > SCHUFA macht Kredit möglich

→ Basisinformationen

→ Die SCHUFA & Ich

## **SCHUFA macht Kredit möglich**

**... by shaping humans**

**... by shaping the environment in  
which humans borrow and save**

# SCHUFA is tied to a host of other networks

banking

real estate

credit cards

law

employee rating agencies

the effect of which is to make people more credit-worthy – in other words: more honest



**The Uber App provides a map of your route as you traverse it**

**Calculates the fare and deducts it from your credit card**



it then allows you to rate your driver for punctuality, cleanliness, ...

**Uber *customers* can then use these ratings in making bookings in the future**



But then, when you leave the taxi, the App allows the driver to *rate you*, the customer and these ratings too are stored in the system and used by other *drivers* in the future

*The power of data accumulation*

## **Behind the scenes, good behavior is being rewarded and bad behavior punished**

customers who vomit in the cab, or who behave aggressively, will find themselves restricted in their use of Uber in the future



Uber also digitizes safety. The App gives your daughter a photo, name, and license plate for the stranger who picks her up at 2a.m.

It shares a detailed record of her route; which likewise protects the driver, and ensures that the driver does not get lost in unfamiliar parts of town.



Uber is constantly accumulating vast amounts of information on the micro-details of cities; on prospective drivers, riders, and road conditions; and constantly improving the ways its algorithms instantly present drivers with highly intuitive options – by digitizing transactions

# **Uber makes for better drivers, better cabs, safer rides, better passengers**

– bringing huge advantages especially in third-world countries

AirBNB makes for better lodgings, a wider choice of lodgings, better landlords and better lodgers

Amazon.com makes for more informed consumers, which makes for better products

It also makes for cheaper products, as the information asymmetry between seller and buyer is gradually eroded

## **Tripadvisor makes for better food**

as restaurant ratings are constantly updated by  
ever new customers

Tripadvisor creates a constant competition  
among restaurants

**The internet allows cumulation of the effects of  
single actions**

**Big Data creates the possibility for better  
consumer choices – but also for better  
consumers**

# RateMyProfessors.com



## Martha Nussbaum

Professor in the Law department  
at [University of Chicago](#), Chicago, IL

[ARE YOU MARTHA NUSSBAUM?](#)

[Rate this professor](#)

[Share](#)

[SUBMIT A CORRECTION](#) | [LEARN HOW RATINGS WORK](#)

### OVERALL QUALITY

**3.6**

WOULD TAKE AGAIN

**N/A**

LEVEL OF DIFFICULTY

**3.6**

HOTNESS

### Top 20 Tags for this Professor

See how other students describe this professor.

[CHOOSE YOUR TAGS](#)



- **Recommend and Be Recommended** – In the following 3 categories: *Professional, Personal, Dating*
- **Peeple Number** – Your Peeple Number is the total number of recommendations you have received in all 3 categories
- **Connections** – Find likeminded connections with high Peeple Number scores with our Nearby feature

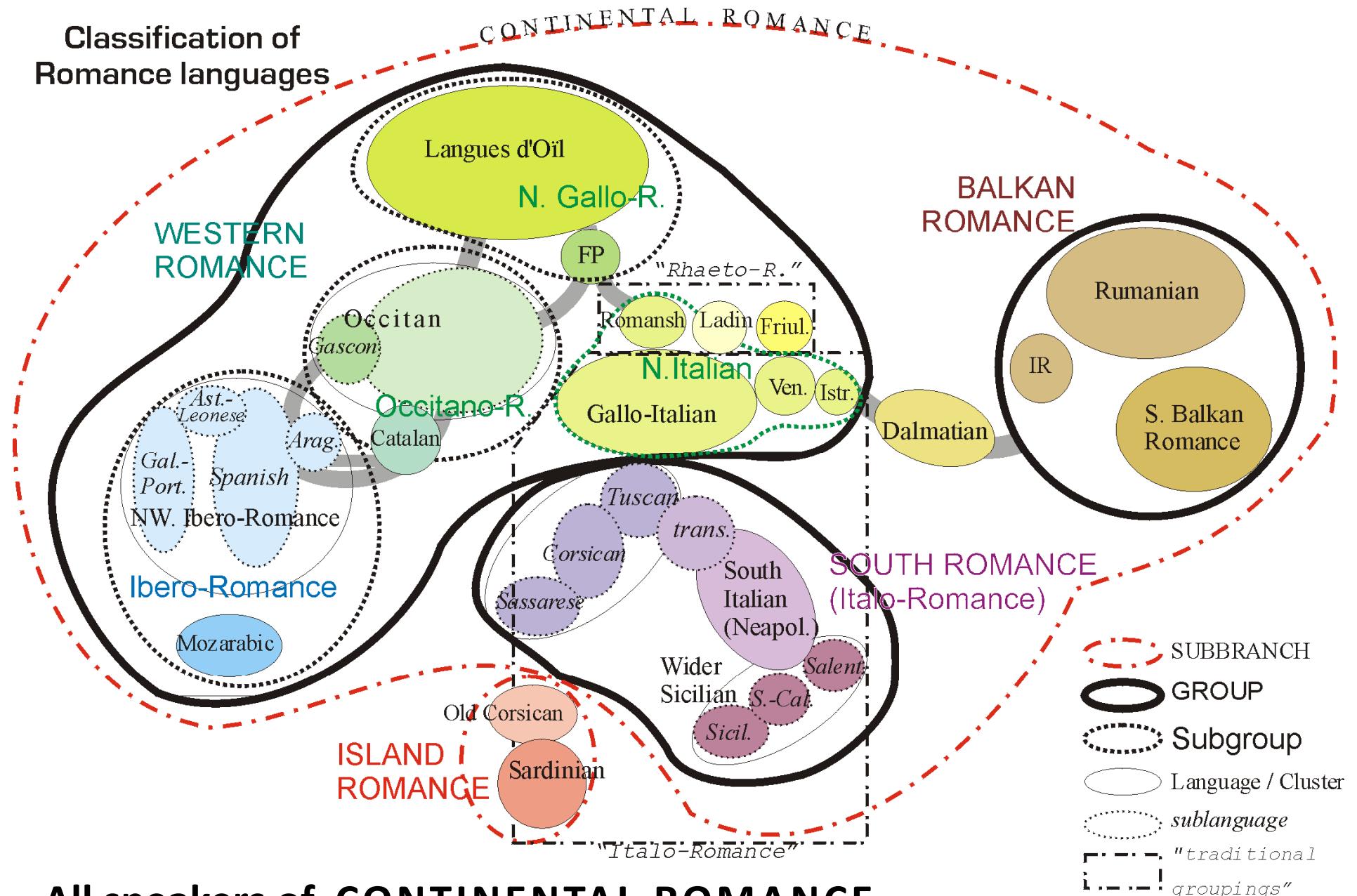
# We are trained to use language

Each person has a set of linguistic competences along multiple dimensions

Persons living in the same community have overlapping sets of linguistic competences – which are what make communication possible

These sets of competences overlap, and merge into each other

## Classification of Romance languages



All speakers of **CONTINENTAL ROMANCE**  
share in common a certain subset of dispositions

# **Das Wörterbuch der Fußballsprache**

*Polnisch – Russisch – Englisch – Deutsch*



**Common languages allow individuals to be joined together into small and large communities through speech acts**

**“I pronounce thee man and wife”**

**“Would you like to dance?”**

**“Can you come to dinner?”**

# **linguistic affordances**

**for human beings the affordances of  
the environment include**

linguistic sounds

written signs

printed signs



Nowadays they include also  
keyboards and screens

we have competences not only for  
speaking, reading and writing  
but also screen (click-) competences  
joystick competences  
keyboard competences

# neurological re-engineering of human beings through repetitive keyboard action

goes back to the 14th century, when the clavichord and harpsichord were introduced

today repetitive keyboard action has the same importance to human action as speaking or writing



repetitive keyboard action is a principal ingredient of modern kinetic warfare



and of cyberwarfare



Zero  
Hedge

On a long enough timeline  
the survival rate for  
everyone drops to zero.

## WWIII? A "Hybrid Geo-Financial War" Between NATO and Russia Is Dangerously Escalating



Submitted by [Tyler Durden](#) on 05/21/2016 22:00 -0400

[BRICs](#) [China](#) [Cohen](#) [Donald Trump](#) [Henry Kissinger](#) [Natural Gas](#) [Poland](#) [President Obama](#) [Ukraine](#)

speech acts and document acts now intermixed with digital acts



communities can themselves serve  
as affordances

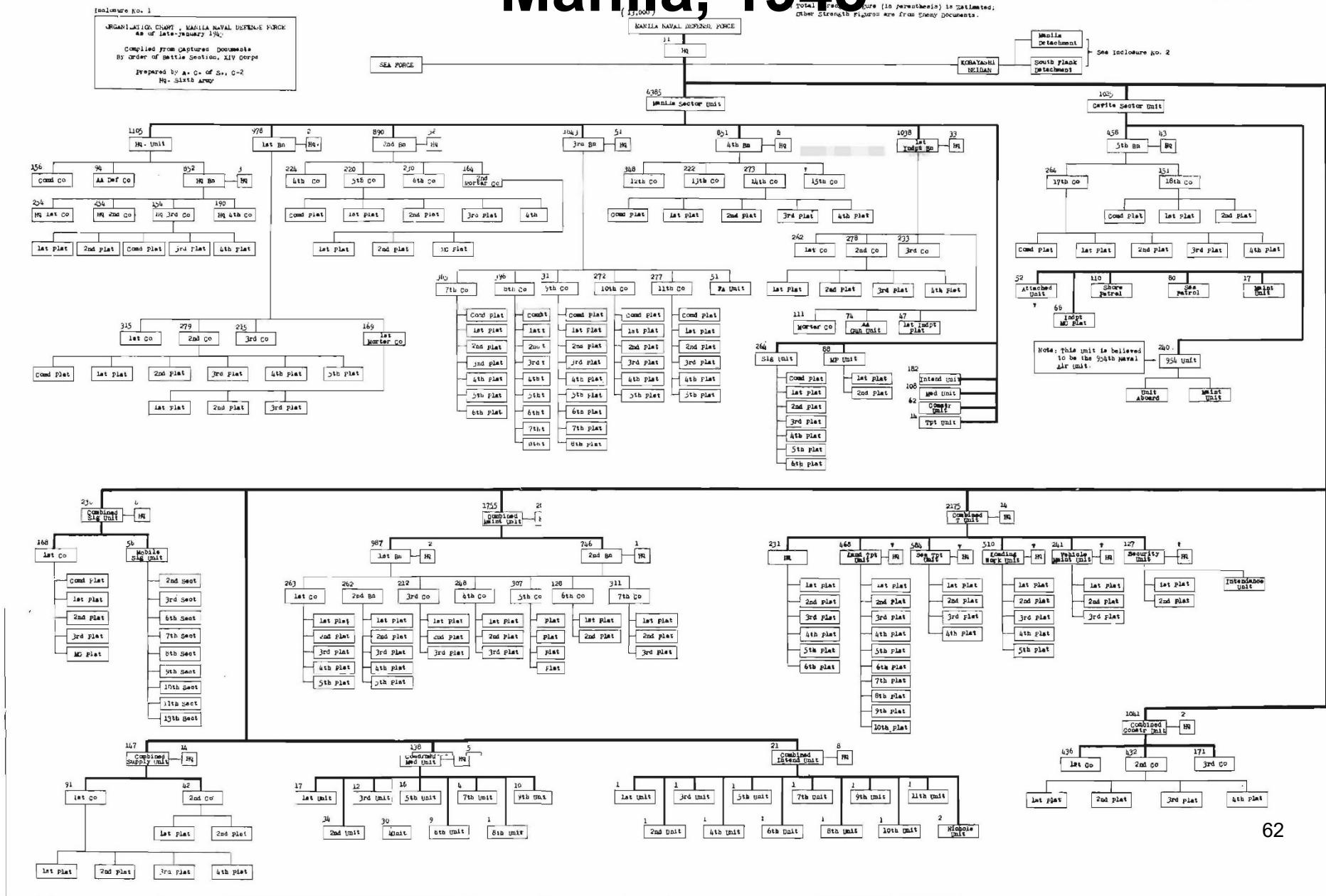
a family *affords bonding*

a group *affords joining*

an enemy encampment *affords bombing*

Some social institutions involve massively complex networks of sub-institutions held together by networks of speech acts and document acts supporting relations of authority and delegation

# Org Chart: Japanese Naval Defense Force Manila, 1945



**as speech acts and document acts  
and digital acts become ever more  
intermixed in every more complex  
and ever more hierarchical  
networks**

**this creates ever more  
comprehensive civil societies**

# **Social Network Sites as Networked Publics**

Networked publics are not just publics networked together,  
... they are publics that have been transformed by networked media, ...

# The Global Jihadi Archipelago

## Scott Atran

Soccer, paintball, camping, hiking, rafting, body building, martial arts training, and other forms of physically stimulating and intimate group action [Graffiti Crews] create a small cultural niche: a bunch of buddies who become a “band of brothers” in a glorious cause (Atran 2010).

# The Global Jihadi Archipelago

Scott Atran

a new kind of transcultural niche that leapfrogs the limits and responsibilities engendered by previous generations within territories of origin. Here, peer communities of imagined kin—bands of “brothers and sisters” drawn willy-nilly from across more than 100 countries and many more ethnic groups—commit in ritual oaths and performance of sublime acts of terror to a new world order

The Global Jihadi Archipelago  
A New Type of Transcultural Niche  
Scott Atran

The internet allows cumulation of the effects of single actions

“Publicity hyped by political and media frenzy is the oxygen that fires modern terrorism (Atran [2013](#)), filling a transcultural niche whose ecology ranges over a media landscape (where competition for resources is a struggle for control of information) and a geographical archipelago that spans the globe.”

The Global Jihadi Archipelago  
A New Type of Transcultural Niche  
Scott Atran

the global jihadi archipelago where information from across the world and cyberspace narrows mightily to fit the dreaming ecology of the Caliphate—a transcultural niche, which ... devoted actors of the Islamic State are fighting unto death to make real.

recall Gibson: the environments in which we live provide niches, enclosures, apertures, signposts, pathways, barriers – they *afford* different sorts of actions

# affordances

“The affordances of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or evil.”

James J. Gibson, *The Ecological Approach to Visual Perception*, 1975

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# DDoS, October 22, 2016

The Internet is under attack. *The New York Times* reported that "major websites were inaccessible to people across wide swaths of the United States on Friday after a company that manages crucial parts of the internet's infrastructure said it was under attack.

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in a troubling development, the attack appears to have relied on hundreds of thousands of internet-connected devices like cameras and home routers that have been infected — without their owners' knowledge — with software that allows hackers to command them to flood a target with overwhelming traffic.