



Semantic Interaction Design

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What is the first thing you do when you start to create/define/specify an Interaction Design?

Don't do that!

There is a better way to start...

What



Chapter 1

Semantic IxD is a proven (cognitive science based) **scalable** UX design method that ensures maximum usability is achieved **10X** more effectively & efficiently than current UX practice today.

Origin of Semantic Interaction Design (IxD) theory goes back decades!

Human Factors Cognitive Ergonomics:

- Task action grammar/Complexity models
- Reisner (1979)
- Spence and Apperley (1984)



Cognitive Science:

- Stages of Action (Norman 2015)
- Design by Levels (Foley 1995)
- Activity Theory (Nardi 1996)
- Consistency (Shneiderman 1988)

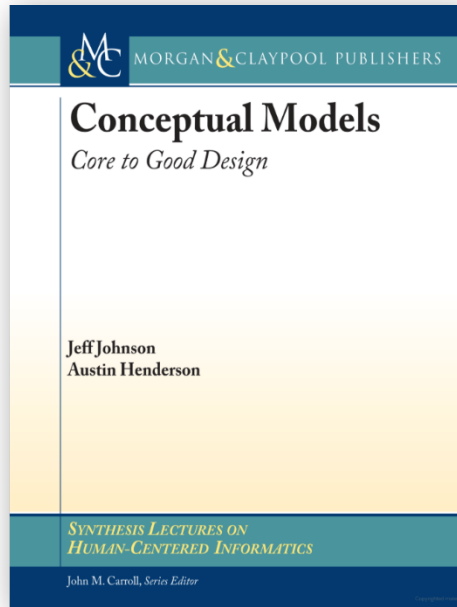


Computer Science

- Objected-Oriented UI (Collins 1995)

Science starts here

2012



Practice Foundation

2020



Complete System

Learn about an innovative IxD method

Deliver designs **faster/smarter**

- Fewer iterations
- Minimize feature creep rework
- Fewer stakeholder meetings
- Science based tradeoff discussions (not opinions, not trial & error)

10X

Efficiency
(your labor)

Deliver **optimal UX** designs

- Minimum number of screens
- Shortest flows
- Lowest cognitive load possible
- Ready to scale for next version

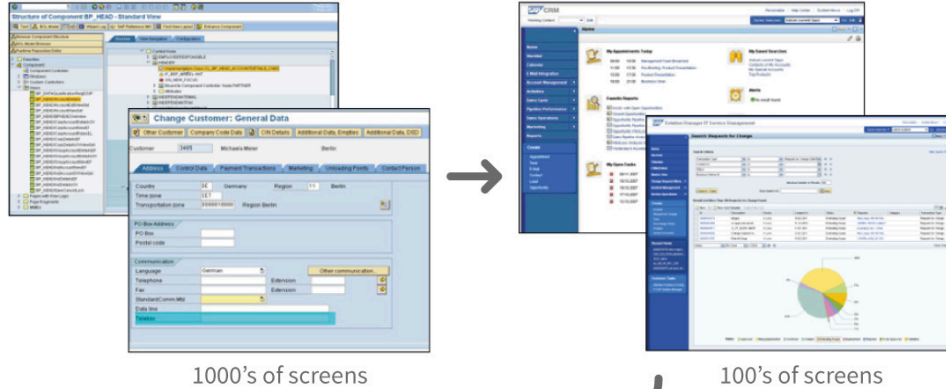
10X

Effectiveness
(design quality)

Can you support **the 10X claim?**



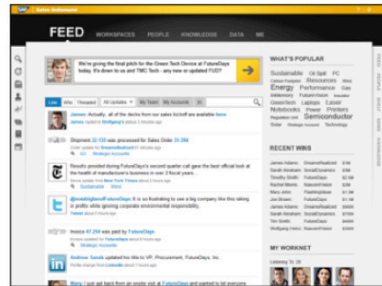
Case studies in
the book



100's of screens

100's of screens

= Over a **100X**
Improvement!



10's of screens

+



5 screens

Before - Can you support this 10x claim?

The image displays a complex medical software interface with several overlapping windows. The top window is titled 'Manager' and contains a menu bar (File, Workup, Assessments, Manage Tx, View, Pharmacy, System Admin, Window, Applications, Help) and a toolbar with icons for various functions like 'Open', 'Summary', 'History', 'Flow Sheet', 'Vital Signs', 'Exam', 'Test Order', 'Rx', 'Phys Order', 'Notes', 'Billing Ev', 'Drug Admin', 'Prov Appr', and 'Reports'. Below the toolbar is the 'Open Patient' window, which has tabs for 'Visit', 'Patient', and 'Reminders'. It shows patient information for 'testaria' and 'patient'. Overlaid on this is the 'New Patient' window, which has tabs for 'General', 'Patient IDs', 'Temporary Address', 'Contacts', 'Demographics', 'Providers', 'Referrals', 'Photograph', and 'Preferences'. It contains fields for 'Last Name', 'First Name', 'Middle Name', 'Other Names', 'Date of Birth', 'Sex', 'Age', 'SIN/SS Country', 'SIN/SS', 'Status', 'Deceased', 'Date of Death', 'Cause of Death', 'Clinical Trial Patient', 'Error / Test Patient', and 'Track Adverse Events'. A 'Print...' button is at the bottom left. Overlaid on the 'New Patient' window is the 'Modify Medical History' window, titled 'testaria, patient - 323456 - Birthdate: Jul 07, 1947'. It has tabs for 'Medical', 'Procedure / Surgical', and 'Gynecologic'. The 'Procedure / Surgical' tab is active, showing a table of surgical procedures. The table has columns for 'Select', 'Valid', 'Procedure / Surgical', 'Comment', 'Age', 'Date', 'Code', and an 'Add' button. The table contains 17 rows of procedures, with 'Appendectomy' and 'Biopsy' checked. Below the table is a checkbox for 'No remarkable Surgical History' and an 'Error' button. At the bottom of the 'Modify Medical History' window are checkboxes for 'Surgical History', 'No Change', and 'Reviewed/Updated', along with 'OK' and 'Cancel' buttons.

800+ screens

After - Can you support this claim?

= An 18X Improvement!

45 screens (5 main ones)

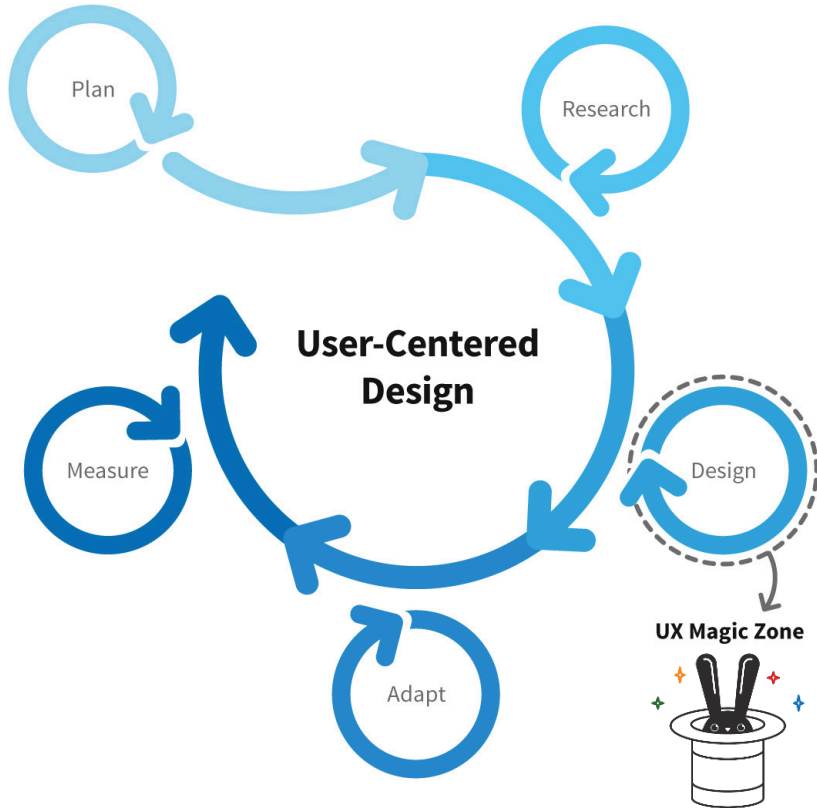
When



Chapter 1

At the heart of the User Centered Design step.

Focus – **Only Interaction Design** step (not full UCD life cycle)



- Other phases are important too
- Necessary but not sufficient

Why



Chapter 1

Because **Design Darwinism** does not work!

Current design methods don't scale to complex systems, are inefficient and often lead to product failure at significant expense because

Real quality is not achieved by eliminating defects – occurs through design

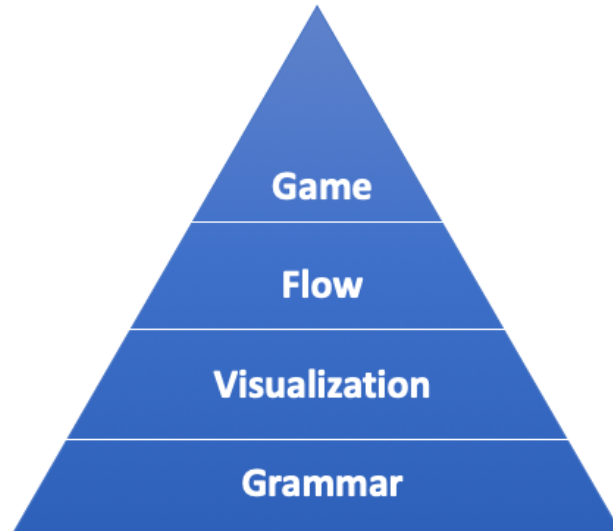
*Design Darwinism = Believing A/B testing is a legitimate form of iteration

How (theory)




Chapter 2

Leverage **2 cognitive** science principles at **4 modular levels** of Interaction Design



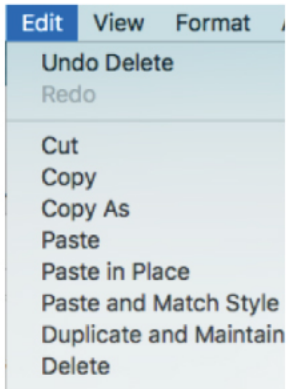
Cognitive Science Foundation of **Semantic Interaction Design**

1. **Language** is the basis of conscious **thought**
2. Language **grammar** correlates with cognitive **complexity**
 - Cognitive load in Interaction Design can be measured (lab)
 -  Cognitive load for Interaction Design can be predicted in advance

Simple Graphical User Interface (GUI) **Semantic** Example (Interaction Design Grammar)

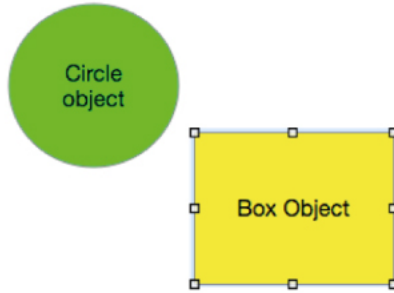
Grammar

Actions



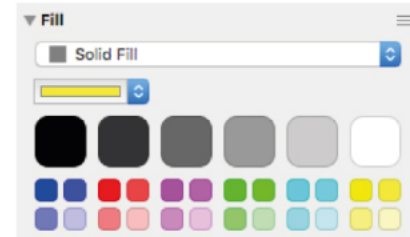
Menu

Objects



Canvas

Attributes



Inspector Dialog Box

Consistency vs. Cognitive Load

		ACTIONS							
		Cut	Remove	Copy	Duplicate	Paste	Stamp	Print	Publish
OBJECTS	Character	X		X		X			X
	Word		X		X		X	X	
	Paragraph		X	X		X		X	
	Page		X		X		X		X
	Document	X		X		X			X

Sparse Object-Action Grammar

Sparse is BAD!

Consistency vs. Cognitive Load

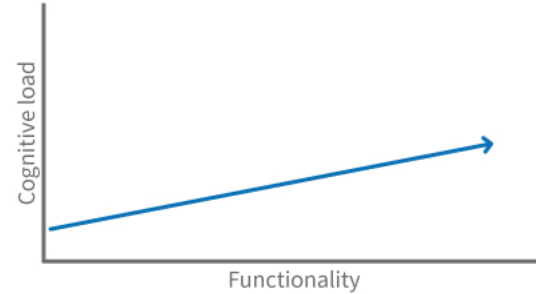
		ACTIONS			
		Cut	Copy	Paste	Print
OBJECTS	Character	X	X	X	X
	Word	X	X	X	X
	Paragraph	X	X	X	X
	Page	X	X	X	X
	Document	X	X	X	X

Dense Object-Action Grammar

Consistency vs. Cognitive Load Calculation

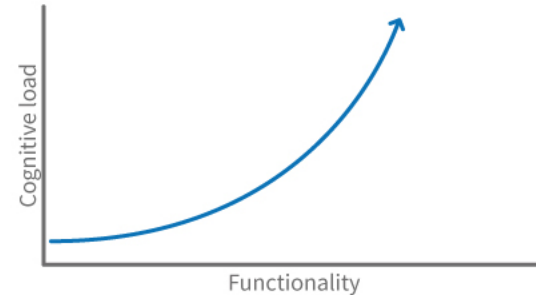
Dense matrix: Load on human memory = **Actions + Objects**

		Actions			
		Cut	Copy	Paste	Print
Objects	Character	X	X	X	X
	Word	X	X	X	X
	Paragraph	X	X	X	X
	Page	X	X	X	X
	Document	X	X	X	X

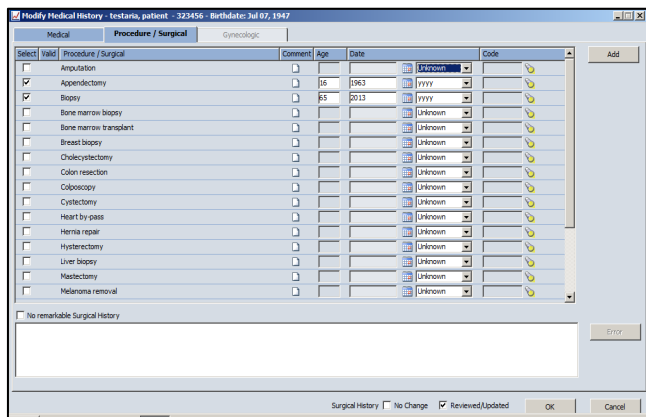


Sparse matrix: Load on human memory = **Actions x Objects**

		Actions							
		Cut	Remove	Copy	Duplicate	Paste	Stamp	Print	Publish
Objects	Character	X		X		X			X
	Word		X		X		X	X	
	Paragraph		X	X		X		X	
	Page		X		X		X		X
	Document	X		X		X			X



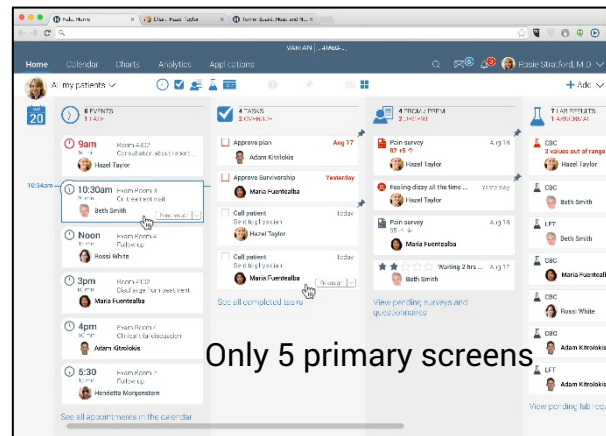
Real Conceptual Model 10x deconstruction in practice!



800
Screens



45
Screens



Only 5 primary screens

	Create	Update	Void	Accept	Reject	Delegate	Approve	Refer	Transfer	Pin
Patient	X	X		X	X			X	X	
Medical record	X	X	X	X	X	X	X	X	X	X
Treatment plan	X	X	X	X	X	X	X		X	
Appointment	X	X	X			X		X		X
Task	X	X	X	X	X	X	X	X		X
Messages	X	X	X					X	X	X
Note	X	X						X	X	X
Care team	X	X				X	X	X	X	

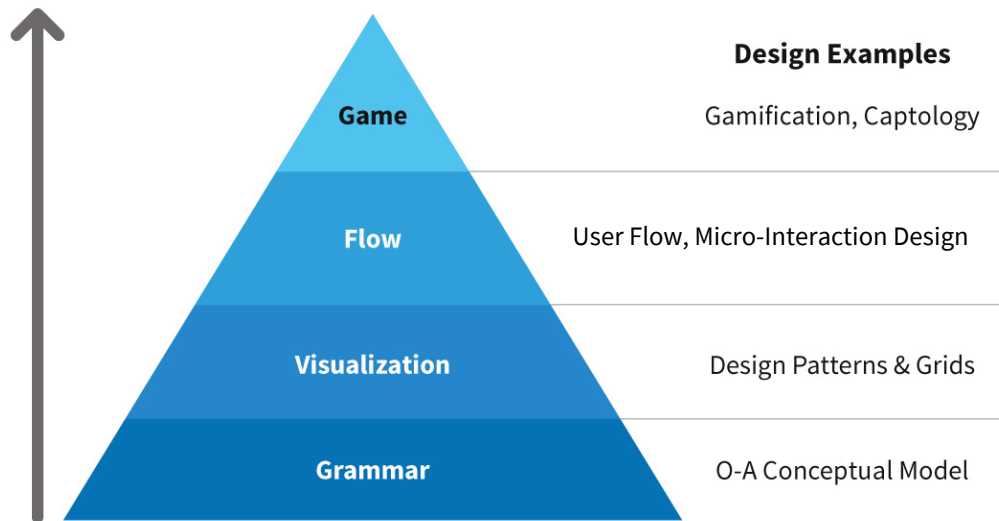
Only 10 objects and 10 actions can describe an entire EMR solution

How (practice)

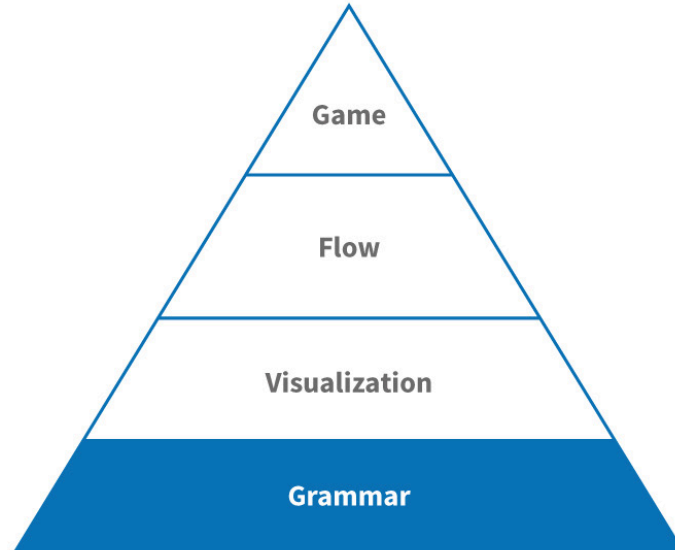


Chapters 4-7

Apply Semantic Interaction Design across all 4 modular **framework** levels



Layer 1 - Grammar



Where do Objects and Actions come from?

Linguistic structure can be mapped to experience design as follows:

Language construct	UX construct	Example
Noun	Object	Box
Verb	Action	Copy
Adjective	Attribute	Color (Yellow)

Process



Define the
Objects and
Actions



Enumerate the
Attributes for every
Object



Prioritize the
object / action
pairs

Conversion of User Stories into conceptual model

Each story expresses a different user goal and can be easily analyzed to identify the nouns, verbs and adjectives the sentence contains.

“As a **parent** I want to **find** a **friendly** **dog** that will help teach my **children** to be responsible.”

“As an **elderly widow** living alone I want to **adopt** a **dog** for my **protection**”

“As a **runner** I need an **active** **dog** that can fit into my exercise routine”

“As a happy **owner** I want to **share** **photos** of my new **dog** with the **MatchDog** **community**”

“As a **pet lover** I would like to **donate** so **MatchDog** can grow its service and help others”

The sentences above are color coded as follows:

Noun > Object

Verb > Action

Adjective > Attribute

Do the math! – **7X difference** in cognitive load

Objects	Donate	Adopt	Join	Schedule	Share	Surrender
Animal	X	X		X	X	X
Money	X		X			X
Services	X			X		X
Info/Ed		X			X	
People		X		X	X	X
Events		X				
Calendar				X	X	X
Advocacy						
Community				X		
Organization		X		X	X	
Shop						

Table 4: A first-draft Object-Action matrix (too sparse and redundant)

Objects	Donate	Adopt	Schedule	Share	Learn
Dog	X	X	X	X	X
Owner	X	X	X	X	X
Organization	X		X	X	X
Money	X		X		

Table 5: Compact Object-Action matrix

Table 4 calculation: **Objects x Actions = 66**

Table 5 calculation: **Objects + Actions = 9**

9 divided by 66 is approximately 14% or **7.3X improvement**

Figure out the Object Attributes!

Animal	Money	People	Services	Event
Species	Donation	Employee	Medical	type
Age	Sponsorship	Customer	Adoption	time
Breed	Volunteer	Board M.	Membership	place
Health	Vehicle	Vet	Volunteer	cost
Personality		Volunteer		duration
Exercise				attendees
Kids friendly				
Other pets				

Attributes don't add significant cognitive load!

They rely on **recognition** not **recall** (the two types of human memory)

Prioritization!

Task = Object + Action(s) combination

Object-Actions pairs **don't have the same level of importance**

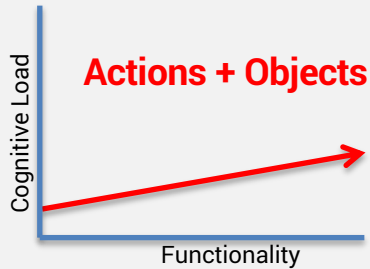
- To the user
- To the business model

Make Common Tasks Easily Accessible

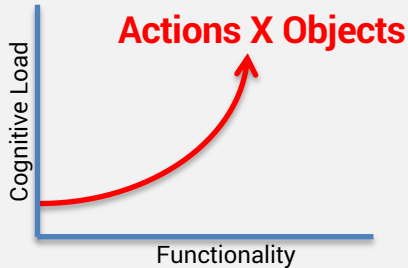
- Two dimensions to evaluate “common”:
 - Frequency (how often)
 - Volume (how many)

	By Many	By Few
Frequent	Most users will do task often	Few users do task, but those who do do it often
Rare	Most users do task, but only rarely	Few users do task, and only rarely
\$ Financial	Micro revenue generation (e.g. advertising)	Macro revenue generation (e.g. paid subscription)

Use this knowledge immediately

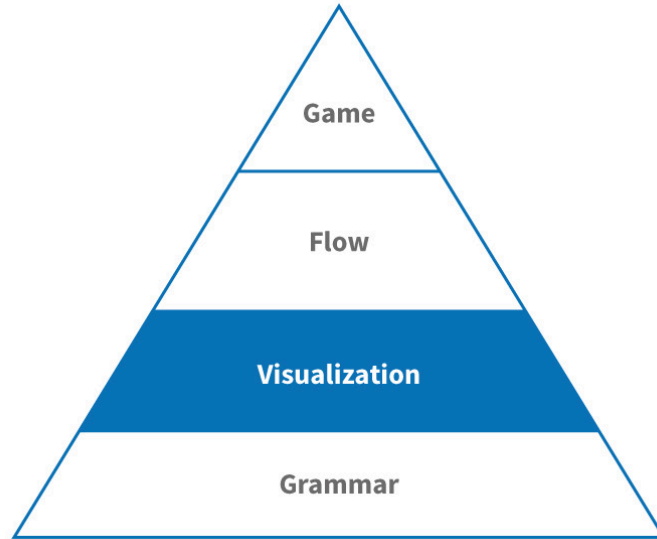


Versus

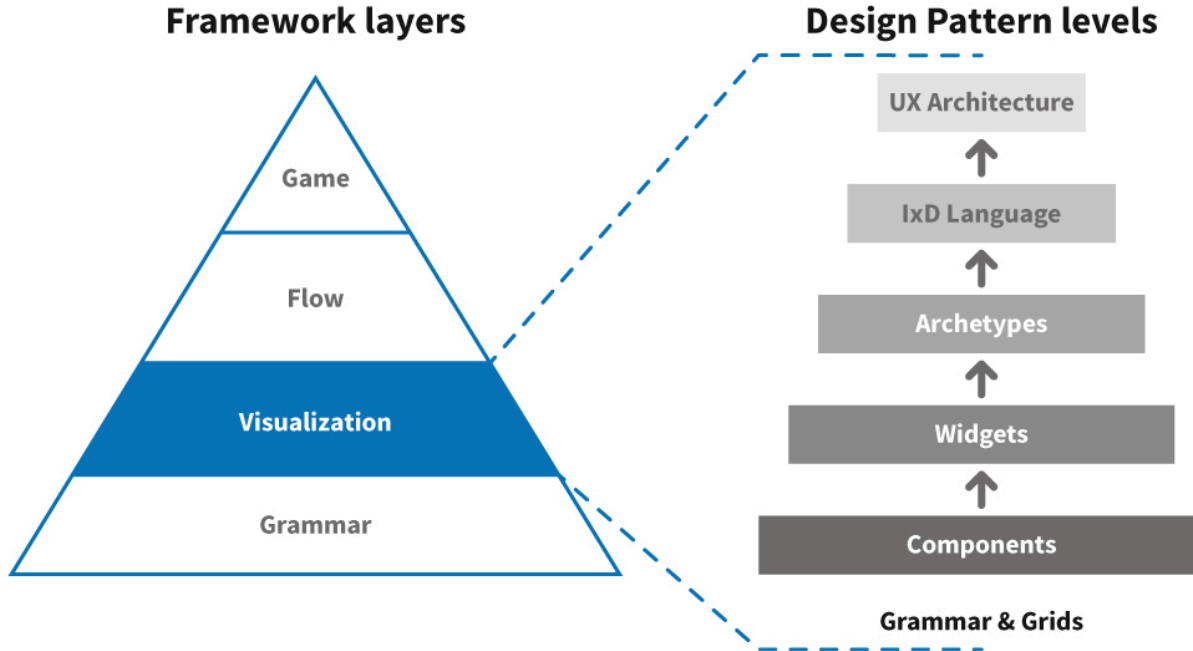


1. Alternative Heuristic **evaluation method**
 - assess cognitive load
 - find mismatches between user mental model and UX
2. UX **Design** method of new projects
 - Minimize screen count and complexity (increase quality)
 - Prioritize tasks before creating mocks (save time)
3. UX **Evolution** of existing products
 - Add features as new **attributes of existing objects**
 - Minimizes complexity
 - Slows growth of cognitive load (due to feature creep)

Layer 2 - Visualization



Visualization Deconstruction



All pattern levels are optimized to present and manipulate **actions, objects** and **attributes** in different ways

Building a Calendar Page UX

Components

Buttons
labels



Widget (little)

Grid
35 buttons
42 labels



Widget (bigger)

Change month icons
Show selection
"Today" button



Calendar Archetype Screen

Day/Week views
Add button
Search box
Color coding



1
2
S
M
T
W
T
F
S



S	M	T	W	T	F	S
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3



December 2008

S	M	T	W	T	F	S
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Select Today

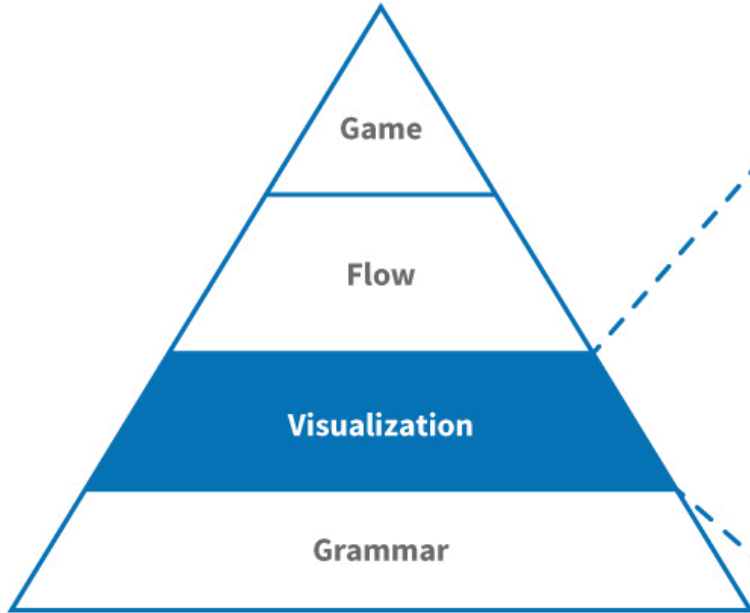


May 2016

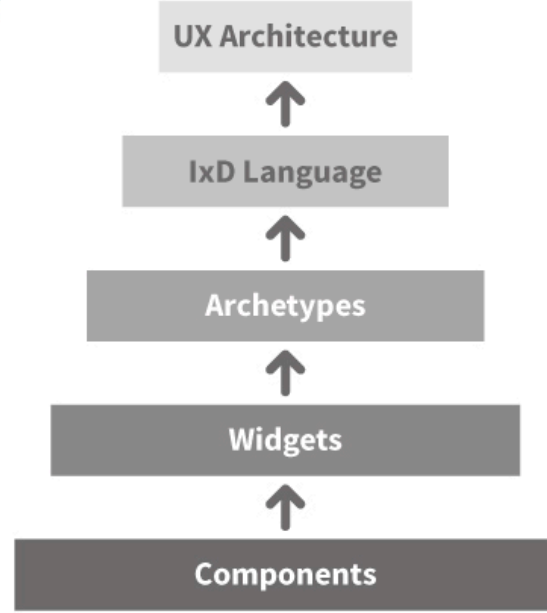
Sun 15 Mon 16 Tue 17 Wed 18 Thu 19 Fri 20 Sat 21

Visualization Deconstruction

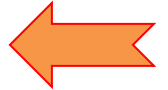
Framework layers



Design Pattern levels



Grammar & Grids



Component Patterns

Name	Attribute	Action	Object	Logic/Behavior
Label	x	x	x	The name attribute of anything, in hypertext a navigate action
Radio button	X			Selection of on state within a set of many attributes
Toggle Button	X			On/off state for only one attribute
Checkbox	X			One of many states of given attribute
Drop list	X			A collection of attribute values
Combo box	X	X		A collection of attribute values with the action to add a new attribute in place
Value Slider	X			Point and click way to choose the numeric value of an attribute
Button		X		Click to execute action it represents
Hypertext link		X		Special case of button with only action to be view/navigate
Icon	x	X		Mostly for actions, some can show visual state
Field (value)	X			Type a value which represents an attribute (typically on of many) for a parent object
Text entry box	X		x	Mostly for annotation which is an attribute
Menu	x	X		Mostly for actions but sometimes change the state of an attribute
Tabs	x		X	Used for granular unit of division for functionality

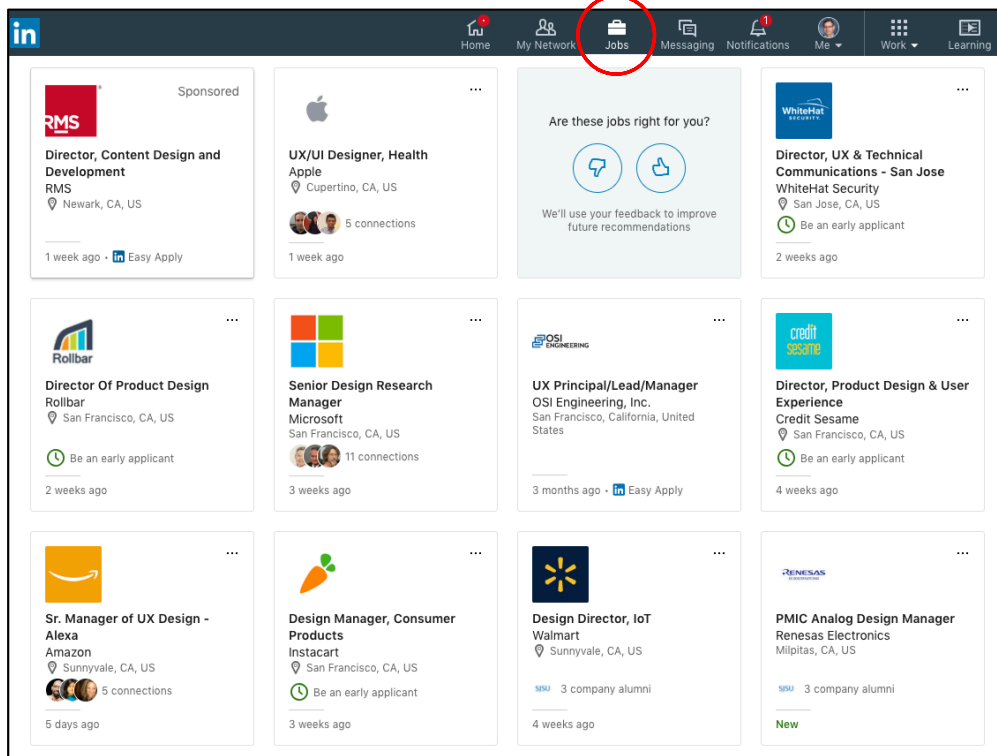
Legend: X (Primary) x (Secondary)

Use today:

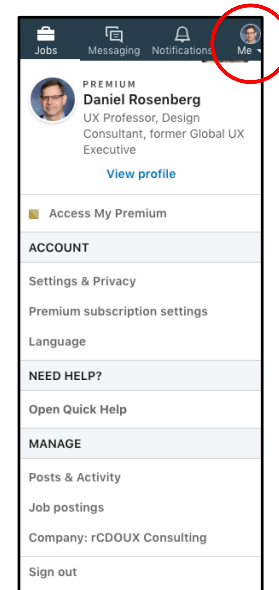
Are you choosing the optimal **component** to express your attributes?

Don't use trial & error or intuition

Example – Menu as Actions versus Objects



Menu of Jobs (Objects)



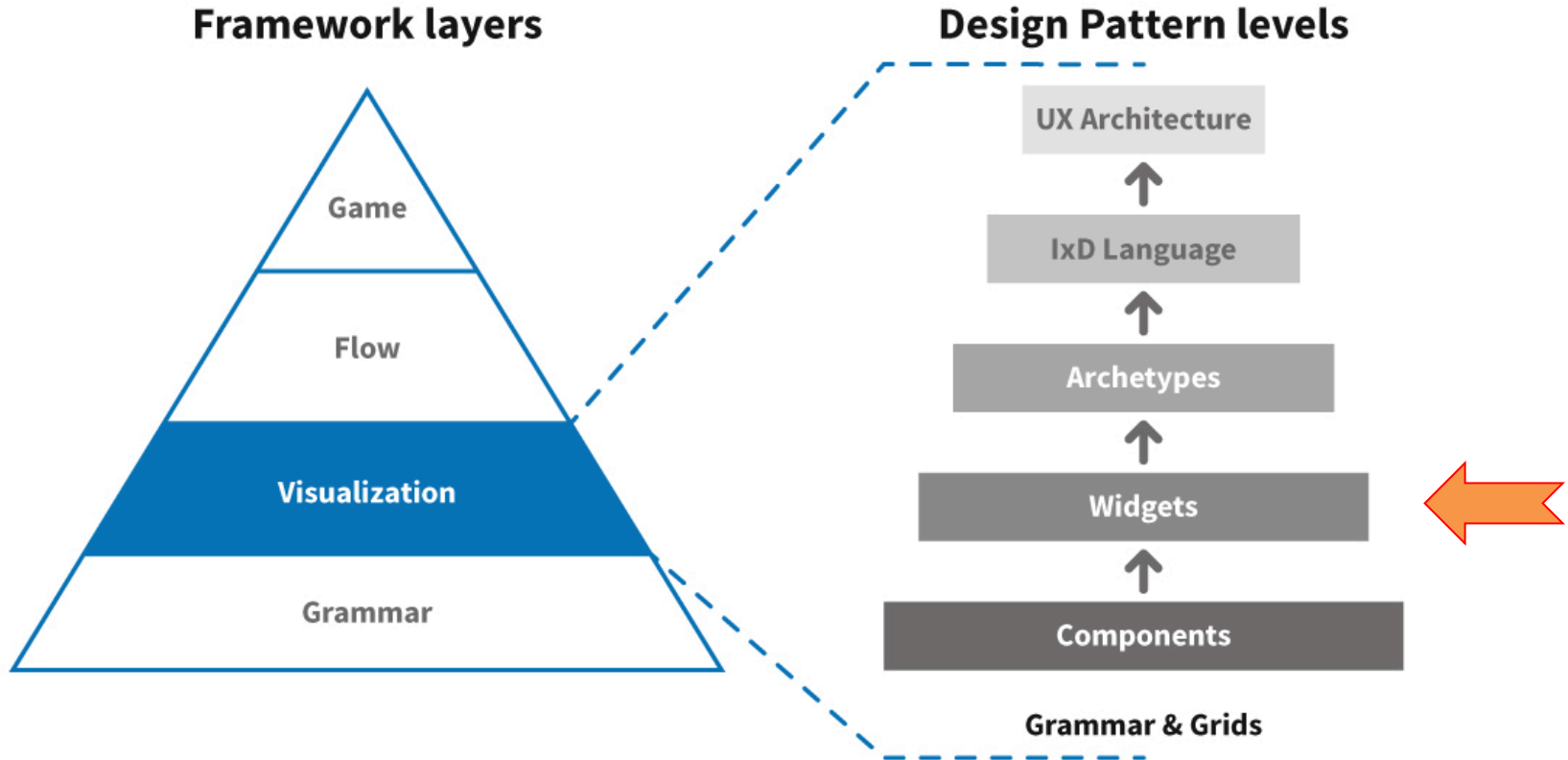
Menu of Actions related to profile

Bad Example

Tabs = 2
Attributes
and 1
Action

The screenshot shows a Yelp interface with a red header. The search bar contains "Find tacos, cheap dinner, Max's" and "Near san jose, CA". Navigation links include Home, About Me, Write a Review, Find Friends, Messages, Talk, and Events. A message bar at the top shows "Inbox (1) Message", "Sent (0) Messages", and "Write New Message" (circled in blue). The main content is a message thread titled "Your Review" between Bill F. and Arian H. Arian H.'s review for Patxi's Pizza is shown with a 5-star rating and text: "Authentic Chicago style pizza! Honestly, the people that work here are SO nice, specially the manager Ben! I've been here twice (once in the store, once delivery) and both times the guys were genuinely nice, chatty, and helpful. Another bonus about this place is they're open late! Awesome! Oh... and the pizza, pasta, garlic twists are great too! Strongly recommended." Bill F., the owner, responds: "Hello Arian - thanks for the 5-stare review! We don't offer pasta or garlic twists at Patxi's; maybe you have us mixed up with another restaurant? We do have great manager named Ben, though!". A "Reply Now" button is visible. At the bottom, there are sections for "About", "Help", "More", "Languages" (English), and "Countries" (United States).

Visualization Deconstruction



Widget Patterns

Name	Attribute	Action	Object	Logic/Behavior
List			X	Table with one column (can be horizontal like a Carrousel or Cover flow)
Table	x		X	Table itself or each row can be an object
Tree control			X	Represents hierarchy of Object
H-Grid				Combination of tree and table, so set attributes be shown as well
Master-detail	X		X	Combination of list of objects and its attributes or Attributes and sub-attributes
Form	x		X	Logically represents an object, fields and controls inside are attributes
Card	x		X	Expanding (Detail)/Collapsing (Summary) element used for a series of object.
Chat box		x	X	Conversation is an object as are the people you have it with
Filter panel	X	X		Uses the action of turning on/off specific attributes to filter data
Shuttle control			X	Two list boxes side by side that allow the selection of objects
Picker	X			Visual palette for colors, fonts, shadow and other visual attributes
Wizard	x	X		Context maybe one object, purposes is to set attributes and commit on final action
Property sheet	X			Container of attributes of given object type
Leader board	X		X	Gamification list of object (people or avatars) sorted in top to worst order
Media control		X		Stop, start, fast forward audio or video

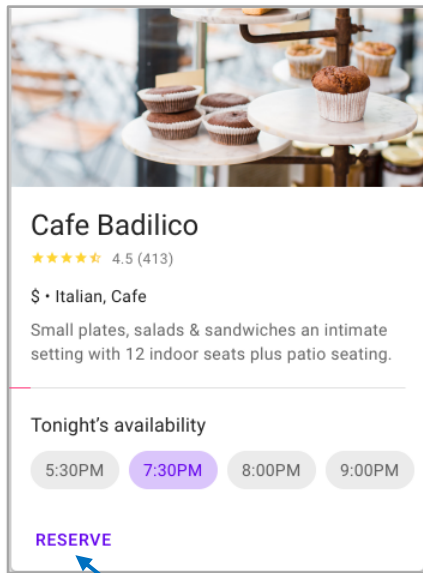
Use today:

Are you
choosing the
optimal widget
to express your
objects?

Don't use trial &
error or intuition!

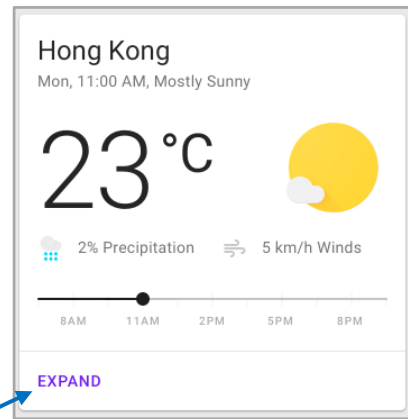
Legend: X (Primary) | x (Secondary)

Card Control – Semantic error example



Local action
(CM transactional)

Many attributes inside card



Local action
(not grammar relevant)

Non-grammatical Widgets

Time

- Feed
- Media controls (VCR)
- Timeline
- Breadcrumbs
- Search box

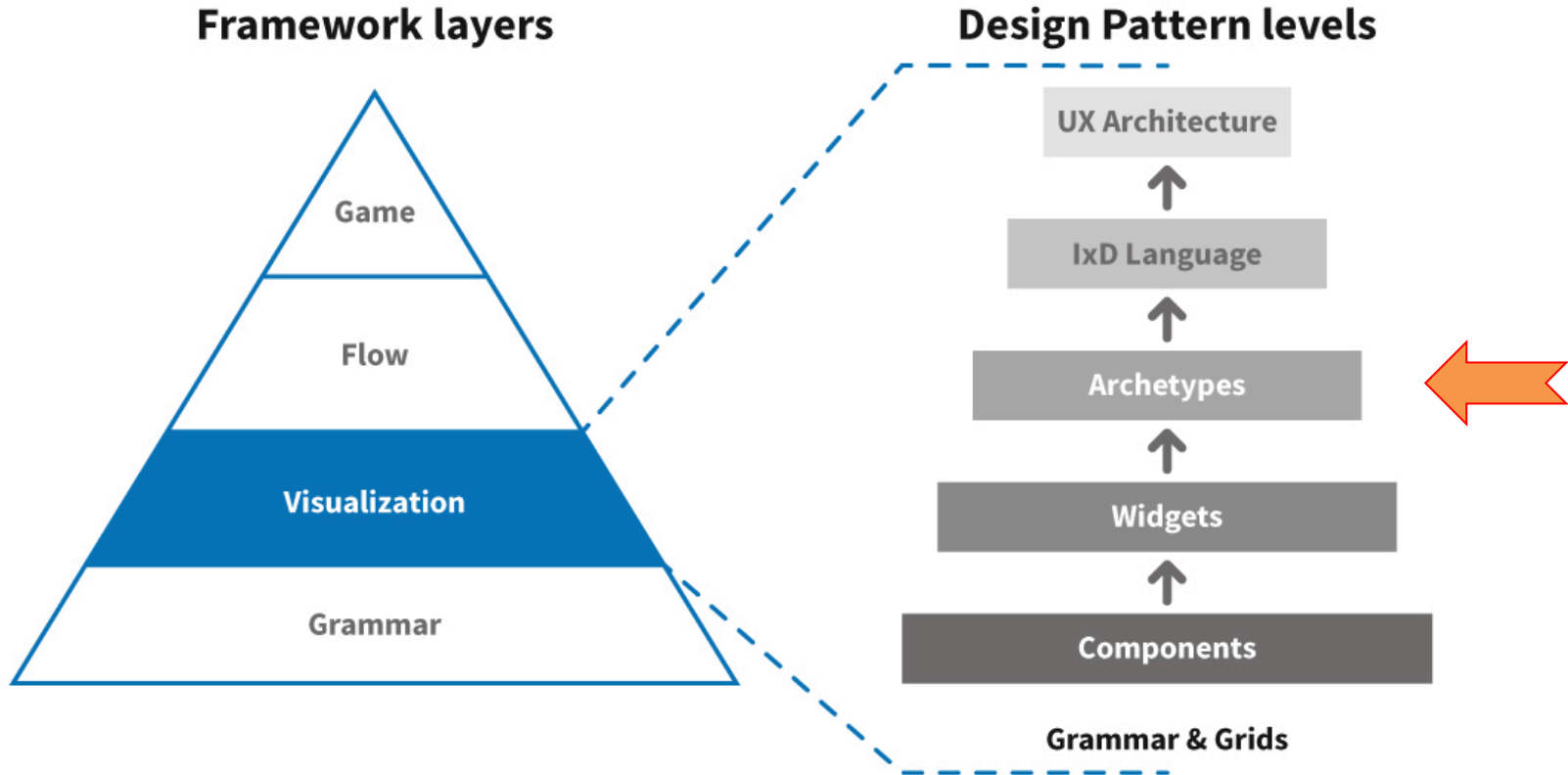
Space

- Zoom controls
- Pan
- Map
- Search results

Container only

- Dialog box
- Toolbar
- Portlet (html iFrame)
- Card
- Page
- Screen

Visualization Deconstruction



Screen Archetype Patterns

Name	Attribute	Action	Object	Logic/Behavior
Menu page		x	X	Object usage can have implicit or explicit selection, to display actions mostly a list
Catalog	X	X	X	Select item to purchase (put in cart)
Funnel	X	X	X	eCommerce "Shopping Cart" to pay and ship. As seen in tax preparation apps.
Desktop	X	X	X	Select item to object to open/run
Portal	X		X	iFrames represent object, content within attributes
Workflow	X	X	X	Multiple step process spanning a single object, actions and attributes embedded
Social	X	x	x	Organized content over time, mostly attributes of people, people are the object
Container organizer	X		X	Master-Master level for object, detail are content of object plus search and create
Tool & Canvas	X	X	X	Objects in canvas, (could be simple box or full engineering CAD drawing)
Workspace	X	X	X	Combines editors, prop sheet and toolbars
Administration tool	X	X	X	Object on the left in hierarchy, props on right
Dashboard	X		X	Frames represent objects, content inside are attributes, filters in panels or toolbars
Report	X		X	Report is the parent object, content is attributes of same
Calendar	X	x	X	Representation of time in a grid or linear layout (top to bottom or left to right)

Legend: X (Primary) x (Secondary)

Use today:

Are you choosing the optimal **archetype** to express your Interaction Design system?

Don't use trial & error or intuition

Archetype: Social (Feed and suggestions)

Objects

Action

Attribute filters

Actions

The image shows a screenshot of a Facebook social feed interface. A red vertical line is drawn down the center of the page, separating the left navigation sidebar from the main content area. The main content area is divided into three sections: a top 'Create Post' section, a middle 'Feed' section, and a bottom 'Suggested Groups' section. The 'Create Post' section has a text input field with the placeholder 'What's on your mind, Daniel?' and a blue 'Object' button. Below it are buttons for 'Photo/Video', 'Tag Friends', 'Feeling/Activ...', and a three-dot menu. The 'Feed' section shows a post by 'Pinkie Hansen' with a text description and a 'Content = Attribute' annotation. Below the post are 'Like' and 'Comment' buttons, and a list of comments from 'Barbara Kenyon', 'Pinkie Hansen', 'Margery Irvin', and 'Gary Hess'. The 'Suggested Groups' section shows three group cards: 'BOND...JAMES BOND', 'Bluegrass Music Trade and Swap', and 'Martin Guitar Owners & Friends'. The top navigation bar includes a search bar, the user's name 'Daniel', and icons for 'Home', 'Find Friends', and notifications. The left sidebar contains navigation options like 'News Feed', 'Messenger', 'Watch', 'Marketplace', 'Shortcuts', 'Explore', and 'Create'. The right sidebar contains 'Stories', 'Suggested Groups', and 'Friend Requests'. Annotations in blue text are placed around the interface: 'Global Actions' at the top right, 'Local Actions' on the right side, and 'Feed Widget in the center' at the bottom center.

Global Actions

Local Actions

Local Actions

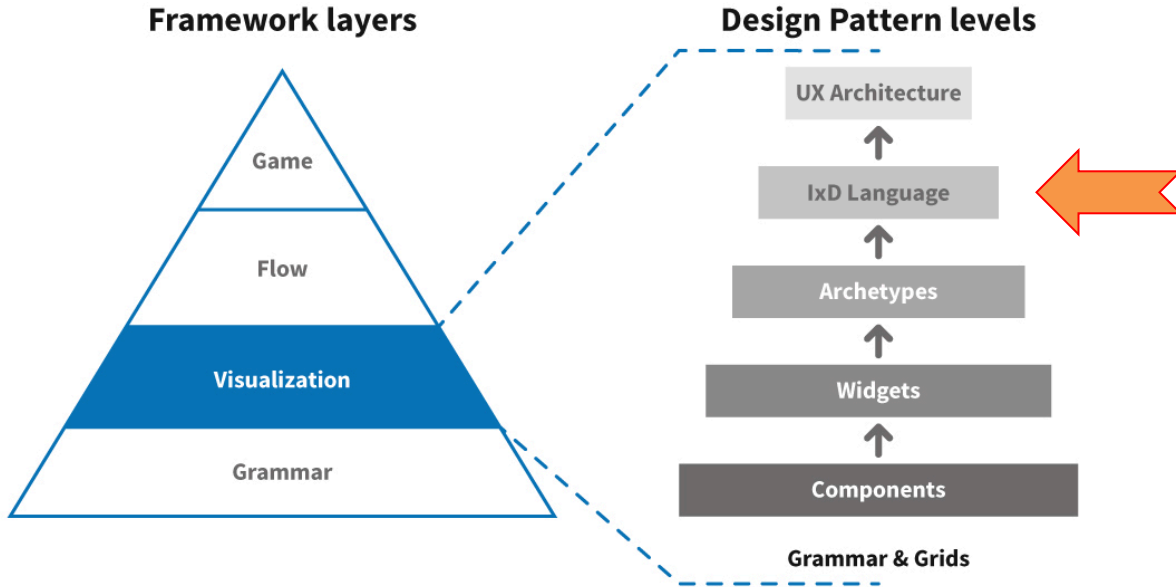
Local Actions

Local Actions

Local Actions

Feed Widget in the center

Visualization Deconstruction



Use today:

Are you **consistently expressing the grammar** across all your design decisions?

Medical Interaction Design Language examples

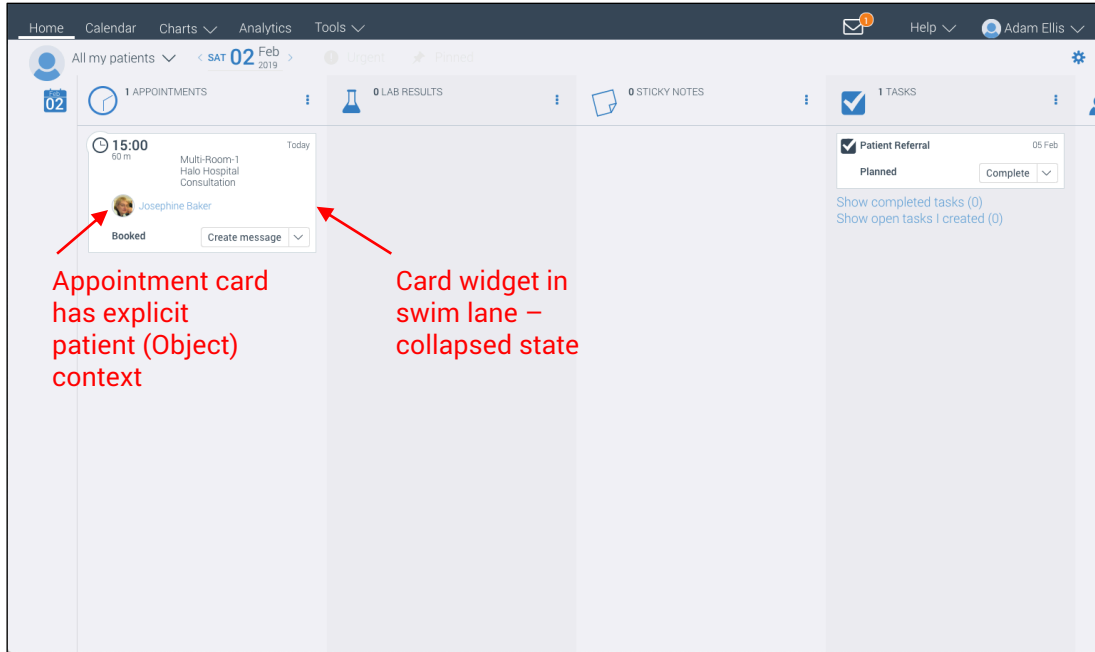
1. Behavior the **Appointment Object** inside different archetypes
2. Consistent use of the **Void Action** to remove errors

A day in the life of...

EMR Conceptual Model

	Create	Update	Void	Accept	Reject	Delegate	Approve	Refer	Transfer	Pin
Patient	X	X		X	X			X	X	
Medical record	X	X	X	X	X	X	X	X	X	X
Treatment plan	X	X	X	X	X	X	X		X	
Appointment	X	X	X			X		X		X
Task	X	X	X	X	X	X	X	X		X
Messages	X	X	X			X		X	X	X
Note	X	X				X		X	X	X
Care team	X	X				X	X	X	X	

Interaction Design Language: Object Example - Appointment

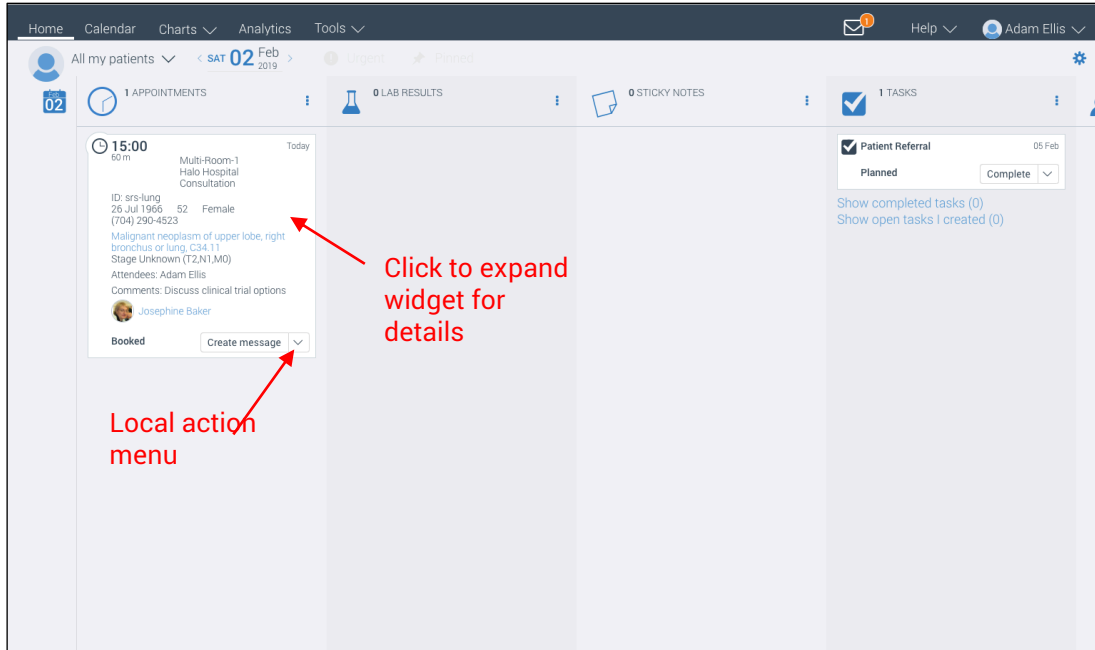


Appointment card has explicit patient (Object) context

Card widget in swim lane – collapsed state

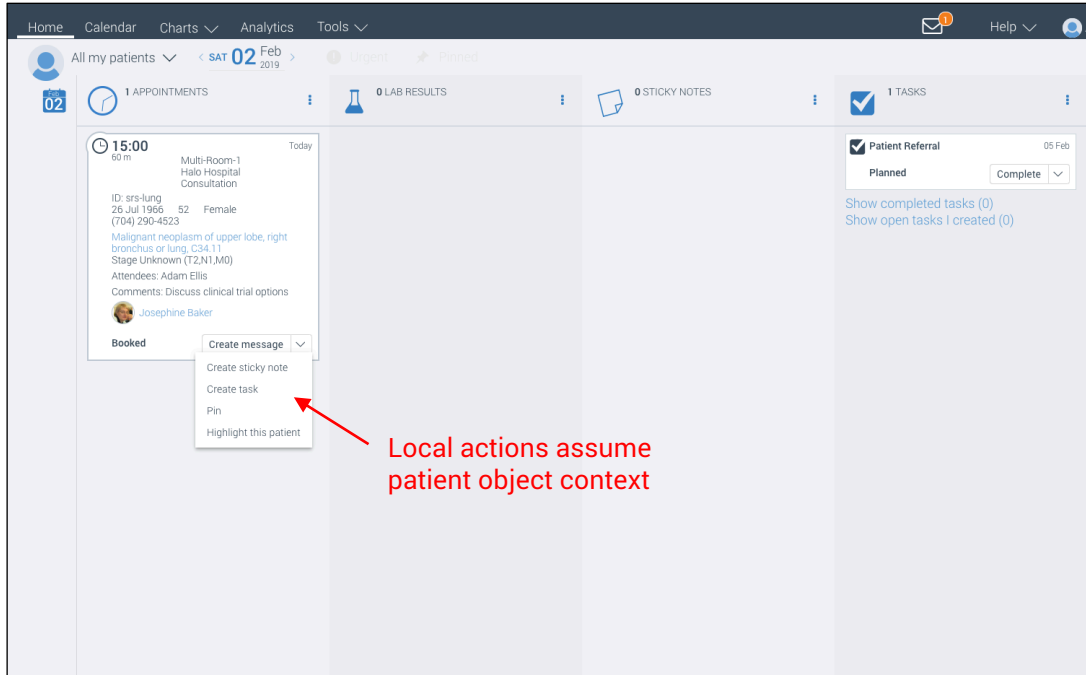
Swimlane Archetype Pattern

Interaction Design Language: Object Example - Appointment



Swimlane Archetype Pattern

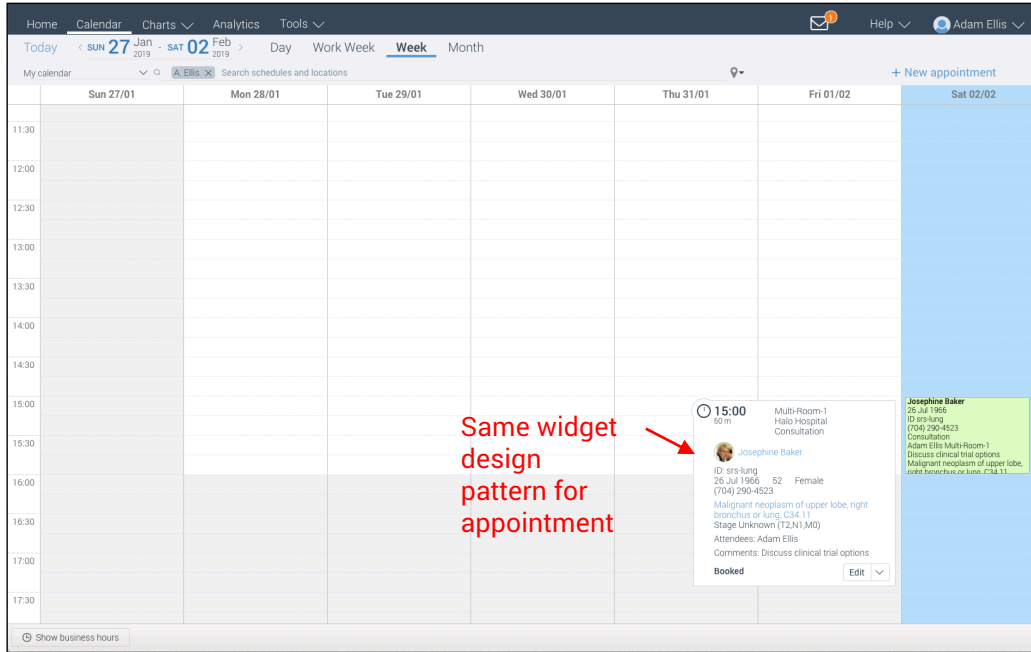
Interaction Design Language: Object Example - Appointment



Local actions assume patient object context

Swimlane Archetype Pattern

Interaction Design Language: Object Example - Appointment



Calendar Archetype Pattern

Interaction Design Language: Object Example - Appointment

The screenshot shows a web-based calendar interface. At the top, there are navigation tabs: Home, Calendar, Charts, Analytics, and Tools. Below these, the current date is shown as 'Today' with navigation arrows for 'Sun 27 Jan 2019' and 'Sat 02 Feb 2019'. The view is set to 'Week' with a 'Month' view option. A search bar contains 'A. Ellis' and a '+ New appointment' button is visible. The calendar grid shows days from Sun 27/01 to Sat 02/02. A time slot at 15:00 on Sat 02/02 is highlighted in blue. A popup window for this appointment displays the following information:

- 15:00** (60m)
- Multi-Room-1 Halo Hospital Consultation
- Josephine Baker** (profile picture)
- ID: srs-kung
- 26 Jul 1966 52 Female (004) 200-4523
- Malignant neoplasm of upper lobe, right bronchus or lung, C34.11
- Stage Unknown (T2N1M0)
- Attendees: Adam Ellis
- Comments: Discuss clinical trial options
- Booked

A local action menu is open over the 'Booked' status, containing the following options:

- Create message
- Create task
- Copy appointment
- Cancel appointment

Red text with arrows points to the popup and the action menu, stating: 'Local action menu context assume Appointment object'.

Calendar Archetype Pattern

Interaction Design Language: Object Example - Appointment

The screenshot displays a patient portal for Josephine Baker, a 52-year-old female with a diagnosis of malignant neoplasm of the upper lobe, right bronchus or lung. The interface includes a navigation bar with tabs for Summary, Diagnosis, Documents, Journal Notes, Forms, Reviews, Patient Health, Treatment, Imaging, CarePulse, Survivorship Demo, Patient Information, and Patient Insi. A timeline at the top shows dates from January 9 to February 15, 2019, with icons indicating events. Below the timeline are three main content areas: Diagnosis, Radiotherapy treatment, and Lab results. The Radiotherapy treatment section is divided into Right Lung and Mediastinum, each with a table of fractions, delivered, and remaining doses. The Lab results section shows a Creatinine test on January 29, 2019. The Appointments section shows a 15:00 appointment on January 29, 2019, at Multi-Room-1, Halo Hospital, with a summary of the appointment details and a 'Booked' status.

Diagnosis
Primary: Malignant neoplasm of upper lobe, right bronchus or lung, Stage Unknown (T2.N1.M0)
Status: Approved

Radiotherapy treatment 1 course(s)
RT - Active - 09 Jan 2019

Right Lung	Fractions	cGy	Treatment Approved
Total	33	6600.0	
Delivered	15	3000.0	
Remaining	18		

RxDose/Fraction: 200 (cGy)
Elapsed Days: 21

Frequency:
First Treatment: 09 Jan 2019
Last Treatment: 29 Jan 2019

Mediastinum	Fractions	cGy	Treatment Approved
Total	33	1980.0	
Delivered	15	900.0	
Remaining	18		

RxDose/Fraction: 60 (cGy)
Elapsed Days: 21

Frequency:
First Treatment: 09 Jan 2019
Last Treatment: 29 Jan 2019

Lab results
Creatinine 29 Jan
3 more

Appointments
15:00 Today
60 m
Multi-Room-1
Halo Hospital
Consultation
Malignant neoplasm of upper lobe, right bronchus or lung, C34.11
Stage Unknown (T2.N1.M0)
Attendees: Adam Ellis
Comments: Discuss clinical trial options
Booked

Next upcoming appointment summary in widget

Portal Archetype Pattern

Conceptual model

	Create	Update	Void	Accept	Reject	Delegate	Approve	Refer	Transfer	Pin
Patient	X	X		X	X			X	X	
Medical record	X	X	X	X	X	X	X	X	X	X
Treatment plan	X	X	X	X	X	X	X		X	
Appointment	X	X	X			X		X		X
Task	X	X	X	X	X	X	X	X		X
Messages	X	X	X			X		X	X	X
Note	X	X				X		X	X	X
Care team	X	X				X	X	X	X	

Interaction Design Language: Action Example – Void Data

The screenshot shows an EMR interface for a patient named Erna McDougall. The 'Diagnosis' tab is active, displaying a list of diagnoses. A red circle highlights the 'Include voided' checkbox, which is currently unchecked. A red arrow points to the 'Void diagnosis' option in a dropdown menu, which also includes 'Recurrence' and 'Metastasis'.

30 Jan 2019
Malignant neoplasm of prostate
Approved: Staff Entry
Active

30 Jan 2019
Intraductal carcinoma in situ of unspecified breast
Stage Unknown
Approved: Staff Entry
Active

Recurrence
Metastasis
Void diagnosis

Void action – removes mistake. Data is never “deleted” in an EMR for forensic reasons

Canvas Archetype Pattern

Interaction Design Language: Action Example – Void Data

The screenshot displays a medical diagnosis interface for a patient named Erna McDougall. The patient's details include a birth date of 26 Jul 1966 (52) Female and a medical history of Intraductal carcinoma in situ of unspecified breast (Stage Unknown). The interface features a navigation bar with tabs for Summary, Diagnosis (selected), Documents, Journal Notes, Forms, Reviews, Patient Health, Treatment, Imaging, CarePulse, and Survivorship Demo. Below the navigation bar, there are filters for 'Active' and 'All', and a checked 'Include voided' checkbox. Two diagnosis cards are visible: one for 'Malignant neoplasm of prostate' dated 30-Jan-2019, and another for 'Intraductal carcinoma in situ of unspecified breast' dated 30 Jan 2019. The text 'Malignant neoplasm of prostate' is crossed out with a red line. Red annotations with arrows point to the 'Include voided' checkbox, labeled 'View control checked', and the red strikeout on the first diagnosis card, labeled 'Strikeout visualization for void data'.

Erna McDougall

26 Jul 1966 (52) Female
00IGRT_210

Intraductal carcinoma in situ of unspecified breast
Stage Unknown

+ New for Erna

< Summary **Diagnosis** Documents Journal Notes Forms Reviews Patient Health Treatment Imaging CarePulse Survivorship Demo f >

Active ▾ All ▾ Include voided **View control checked** + Add

~~30-Jan-2019~~
~~Malignant neoplasm of prostate~~
Approved: Staff Entry
Active

30 Jan 2019
Intraductal carcinoma in situ of unspecified breast
Stage Unknown
Approved: Staff Entry
Active

Strikeout visualization for void data

Canvas Archetype Pattern

Interaction Design Language: Action Example – Void Data

The screenshot displays a medical record interface for a patient named Erna McDougall. The patient's details include a birth date of 26 Jul 1966 (52) Female and a diagnosis of Intraductal carcinoma in situ of unspecified breast, Stage Unknown. The interface features a navigation bar with tabs for Summary, Diagnosis, Documents, Journal Notes, Forms, Reviews, Patient Health, Treatment, Imaging, CarePulse, and Survivorship Demo. Below the navigation bar, there are filters for 'Active' and 'All', and a checkbox labeled 'Include voided' which is unchecked. A red arrow points to this checkbox with the text 'View control not checked'. A diagnosis card is visible, dated 30 Jan 2019, with the text 'Intraductal carcinoma in situ of unspecified breast', 'Stage Unknown', 'Approved: Staff Entry', and 'Active'. A red annotation next to the card reads 'Voided Diagnosis card widget removed from canvas'. A '+ Add' button is located in the top right corner of the main content area.

Canvas Archetype Pattern

Interaction Design Language: Action Example – Void Data

The screenshot shows a medical diagnosis form for a patient named Erna McDougall. The diagnosis is 'Intraductal carcinoma in situ of unspecified breast' dated 30 Jan 2019. The form is divided into sections: 'Definition', 'Clinical', and 'Staging'. The 'Staging' section is currently selected and contains a 'Distant Metastasis (M)' section with radio button options for M0, M0(+), and M1. Annotations with red arrows point to specific UI elements: one points to the 'Staging' tab, another to the 'M1' radio button, and a third to the 'Void this stage' checkbox. A side note explains that the 'Void' action is identical to the one used in appointment cards.

Erna McDougall | 26 Jul 1966 (52) Female | 00IGRT_210 | Intraductal carcinoma in situ of unspecified breast | Stage Unknown | + New for Erna

Summary | **Diagnosis** | Documents | Journal Notes | Forms | Reviews | Patient Health | Treatment | Imaging | CarePulse | Survivorship Demo

Active | All | Include voided | + Add

30 Jan 2019 | Intraductal carcinoma in situ of unspecified breast | D05.10 | ICD-10-CM

Definition | Stage Unknown - 30 Jan 2019 | + Add | Include voided

Staging

Classification summary (T1s (DCIS),pN0(mol+),M1,G1)

Basis: Clinical | Stage timing: Working stage | Working stage | Void this stage

Date staged: 30 Jan 2019 | Stage: Unknown | Custom | Staging Site/Disease: Breast | Scheme: AJCC 8th Ed.

N | **M** | G | HER2 | ER | PR | OncotypeDx

DISTANT METASTASIS (M)

Code	Definition
<input type="radio"/> M0	No clinical or radiographic evidence of distant metastases
<input type="radio"/> M0(+)	No clinical or radiographic evidence of distant metastases in the presence of tumor cells or deposits no larger than 0.2 mm detected microscopically or by molecular techniques in circulating blood, bone marrow, or other nonregional nodal tissue in a patient without symptoms or signs of metastases
<input checked="" type="radio"/> M1	Distant metastases detected by clinical and radiographic means (cM) and/or histologically proven metastases larger than 0.2 mm (pM)

Active | History | Approved: Staff Entry | Save | Cancel

Two level tab widget embedded inside card widget

Void action can be applied to individual attributes at a detailed level within the diagnosis

Side note: Click to expand card "implicit action" behavior is identical to appointment card widget

Canvas Archetype Pattern

Interaction Design Language: Action Example – Void Data

The screenshot displays a medical record interface for a patient named Erna McDougall. The patient's details include a date of birth of 26 Jul 1966 (52) Female and a medical condition of Intraductal carcinoma in situ of unspecified breast, Stage Unknown. The interface features a navigation bar with tabs for Summary, Diagnosis (selected), Documents, Journal Notes, Forms, Reviews, Patient Health, Treatment, Imaging, CarePulse, and Survivorship Demo. Below the navigation bar, there are filters for 'Active' and 'All', and a checkbox labeled 'Include voided' which is currently unchecked. A red arrow points to this checkbox with the text 'View control not checked'. A single diagnosis card widget is visible, dated 30 Jan 2019, with the text 'Intraductal carcinoma in situ of unspecified breast', 'Stage Unknown', 'Approved: Staff Entry', and 'Active'. A red annotation next to the card reads 'Voided Diagnosis card widget removed from canvas'. A '+ Add' button is located in the top right corner of the main content area.

Canvas Archetype Pattern

Interaction Design Language: Action Example – Void Data

Erna McDougall | 26 Jul 1966 (52) Female 00IGRT_210 | Intraductal carcinoma in situ of unspecified breast Stage Unknown | + New for Erna

< Summary Diagnosis **Documents** Journal Notes Forms Reviews Patient Health Treatment Imaging CarePulse Survivorship Demo F >

Documents (8) Include voided ← Same action design pattern + Upload

Document name	Date of service	Category	Added by	Status	Tags
Imaging Report	30 Jan 2019	Imaging Report	ssidhesh ssidhesh		
Survivorship care plan	30 Jan 2019	Survivorship	Erna McDougall		
Breast_Treatment_Binder	30 Jan 2019	DOCUMENT	Erna McDougall		
Survivorship care plan	30 Jan 2019	Survivorship	Erna McDougall		
Breast_Guideline	30 Jan 2019	GUIDELINE	Erna McDougall		
breast_pathology_report	30 Jan 2019	Pathology Report	Erna McDougall		
breast_pathology_slide_2	30 Jan 2019	Pathology Slides	Erna McDougall		
breast_pathology_slide_1	30 Jan 2019	Pathology Slides	Erna McDougall		

Menu (list) Archetype Pattern

Interaction Design Language: Action Example – Void Data

The screenshot displays a clinical notes interface for a patient named Erna McDougall. The interface includes a header with patient information and a navigation bar with tabs like Summary, Diagnosis, Documents, Journal Notes, Forms, Reviews, Patient Health, Treatment, Imaging, CarePulse, and Survivorship Demo. Below the navigation bar, there is a filter section with a 'Show all' dropdown and an 'Include voided' checkbox. A red arrow points to the 'Include voided' checkbox with the text 'Same action design pattern'. The main content area shows a list of notes, each with a date and time, the author's name (Adam Ellis), and the note title (e.g., 'Test note number 2'). Each note has an 'Edit' button with a dropdown arrow. A red arrow points to the 'Void' option in the dropdown menu of the 'Test note number 1' entry, with the text 'Local action menu'.

Erna McDougall | 26 Jul 1966 (52) Female | Intraductal carcinoma in situ of unspecified breast
00IGRT_210 | Stage Unknown | + New for Erna

< Summary Diagnosis Documents **Journal Notes** Forms Reviews Patient Health Treatment Imaging CarePulse Survivorship Demo f >

Show all Include voided ← Same action design pattern + Add

02 Feb 2019 14:17

Adam Ellis
Test note number 2 Edit ▾

02 Feb 2019 14:17

Adam Ellis
Test note number 1 Edit ▾
Void

Local action menu

Social (Clinical Notes - Feed) Archetype Pattern

Interaction Design Language: Action Example – Void Data

Erna McDougall | 26 Jul 1966 (52) Female 00IGRT_210 | Intraductal carcinoma in situ of unspecified breast Stage Unknown | + New for Erna

< Summary Diagnosis Documents **Journal Notes** Forms Reviews Patient Health Treatment Imaging CarePulse Survivorship Demo f >

Show all ▾ Include voided ← Same action design pattern + Add

02 Feb 2019 14:17

Adam Ellis
Test note number 2 Edit ▾

02 Feb 2019 14:17

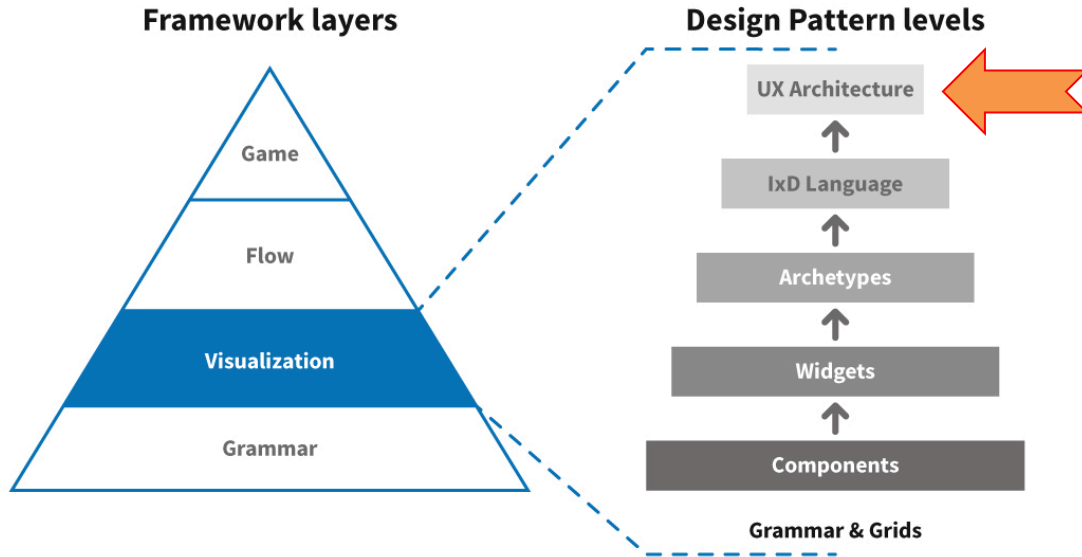
Adam Ellis
~~Test note number 1~~ Edit ▾

Strikeout visualization for void data

Local action menu disabled rule

Social (Clinical Notes - Feed) Archetype Pattern

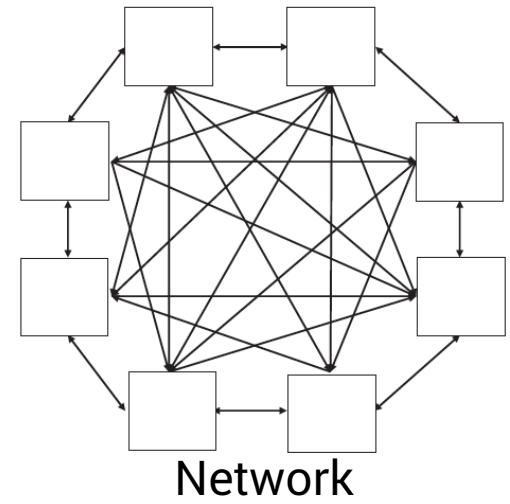
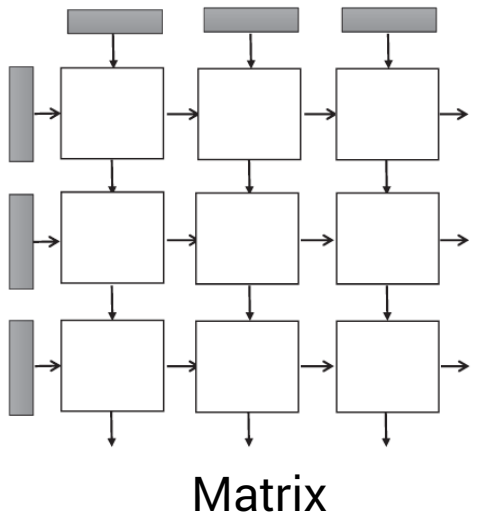
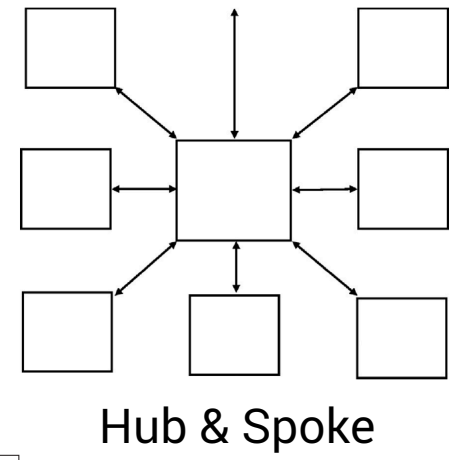
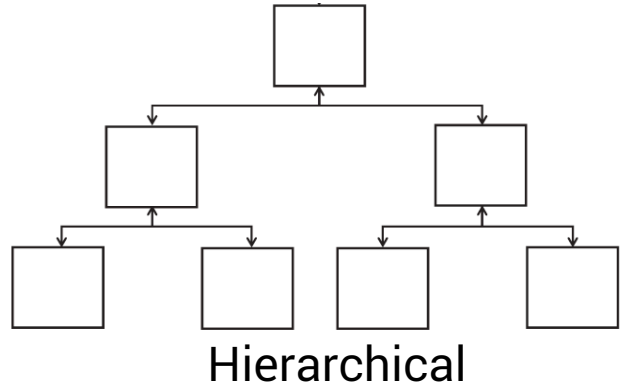
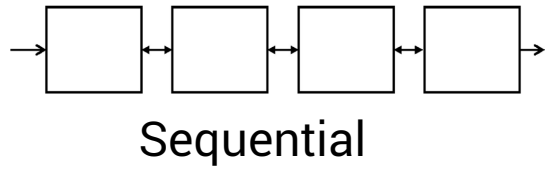
Visualization Deconstruction



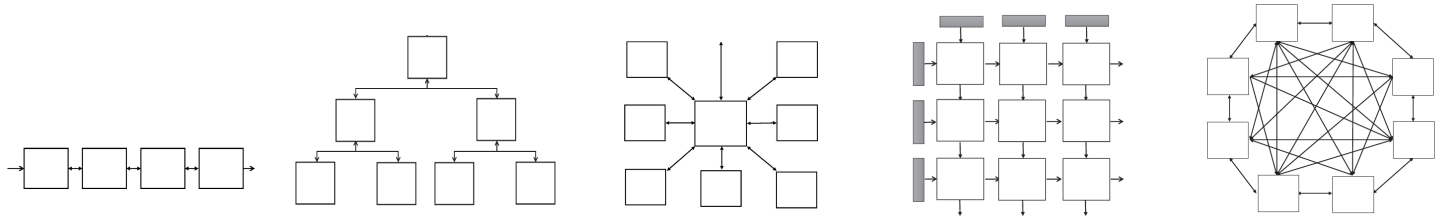
Use today:

Have you **chosen the most effective UX architecture to navigate** across all your primary **objects**?

UX Architecture



UX Architecture – Performance characteristics



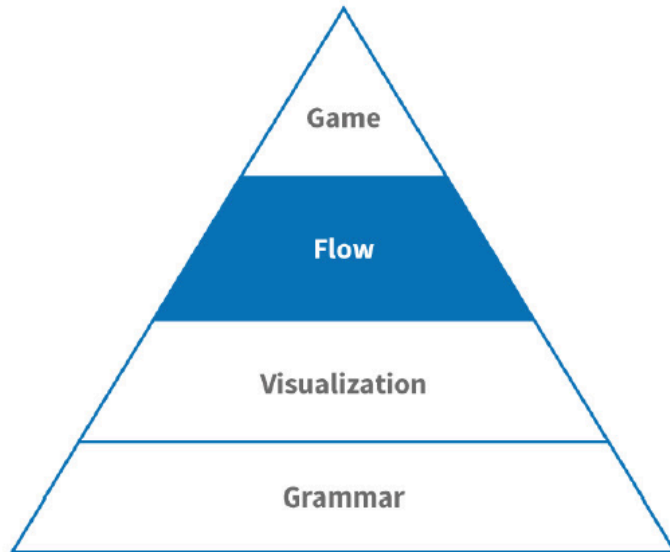
	Sequential	Hierarchical	Hub & Spoke	Matrix	Network
Location Awareness	High	Medium	Medium	Medium	Low-Med
Visual Search Effectiveness	High	High	High	Medium	Med-High
Task Speed	Low	Low	Low	Low-Med	Low-Med
Working Memory Load	Low	Medium	Medium	Medium	Med-High
Learnability	Easy	Fast & Easy	Fast & Easy	Medium	Low-Med
Effectiveness	High	High	High	Medium	Med-High
Efficiency	Low	Low	Low	High	High
Satisfaction	Medium	Med-High	Med-High	Low-Med	Medium

Who: **Digital Natives** recognize Interaction Design patterns

- **5B of the 7.7B** people on earth interpret GUI design patterns as Actions and Objects (Interaction Design Grammar)
 - Thanks to the internet and smart phone global penetration
- **The other 2.7B** whether **literate or not...**
 - Must linguistically associate physical world metaphors with on screen **objects and actions** to participate in HCI
 - They will be (self) taught based on their own natural language of **nouns and verbs** to understand what any new tool can do

99% of the digital product and service economy are in the first 5 Billion

Layer 3 - Flow



Use today:

Are you **minimizing the number of steps and screens** across all your entire product system?

Actions propel Objects through Flow

Actions

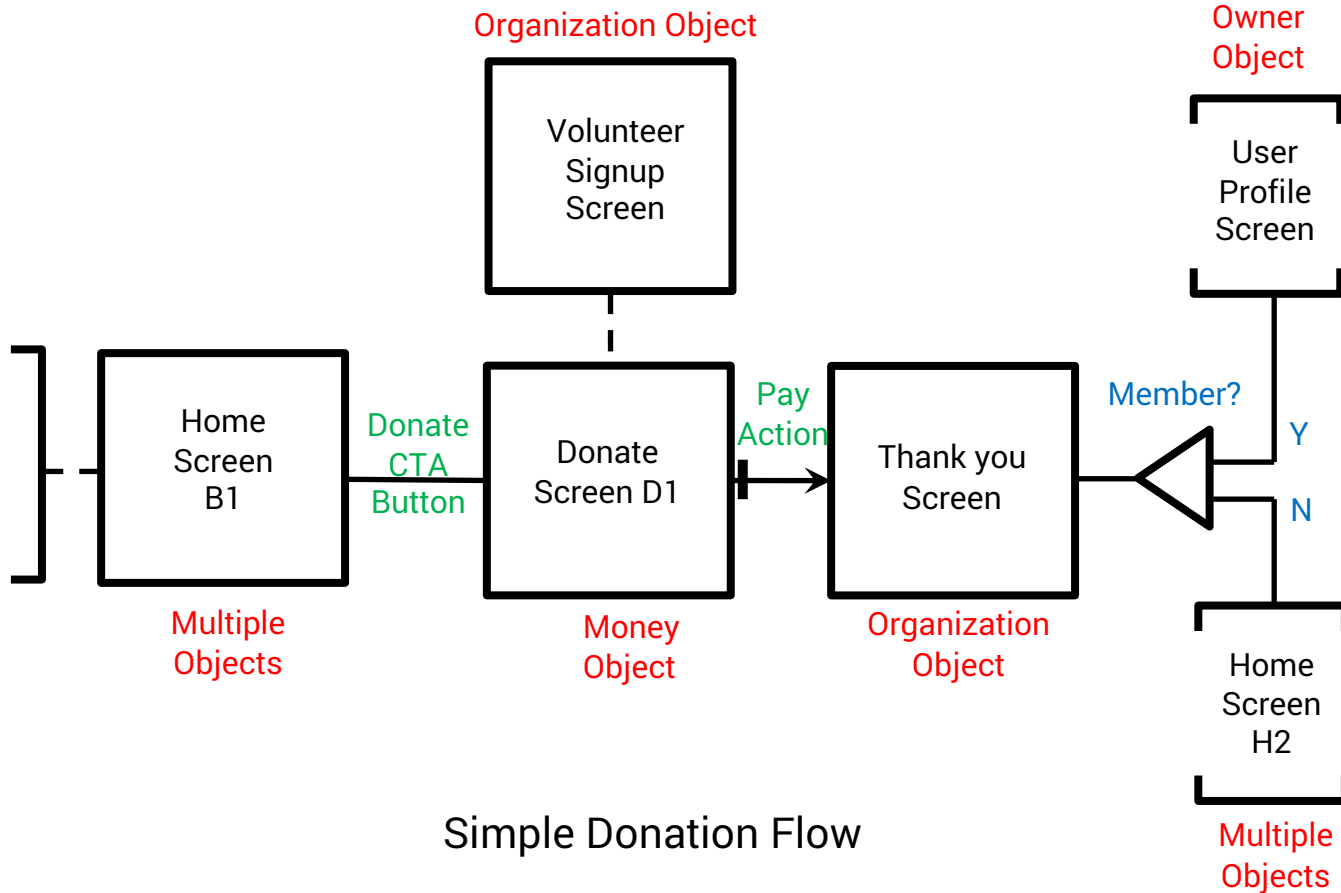
Objects	Donate	Adopt	Schedule	Share	Learn
Dog	X	X	X	X	X
Owner	X	X	X	X	X
Organization	X		X	X	X
Money	X		X		

Most BOXES will represent **OBJECTS**

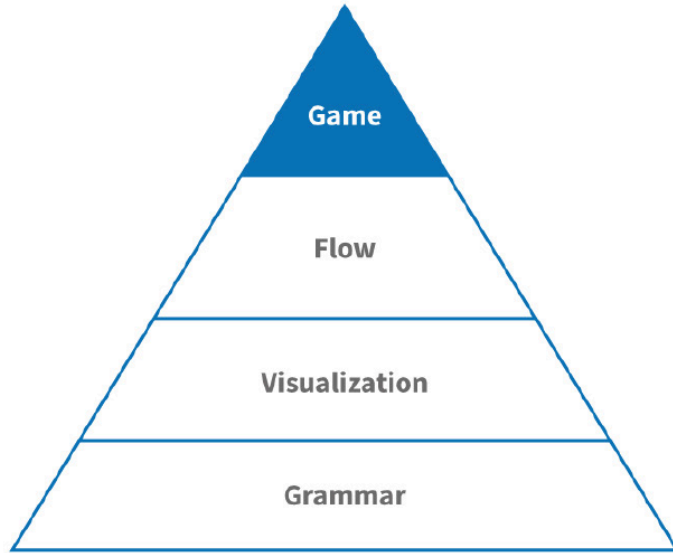
Most LINES will represent **ACTIONS**

Simple Donation Flow

Actions propel Objects through Flow



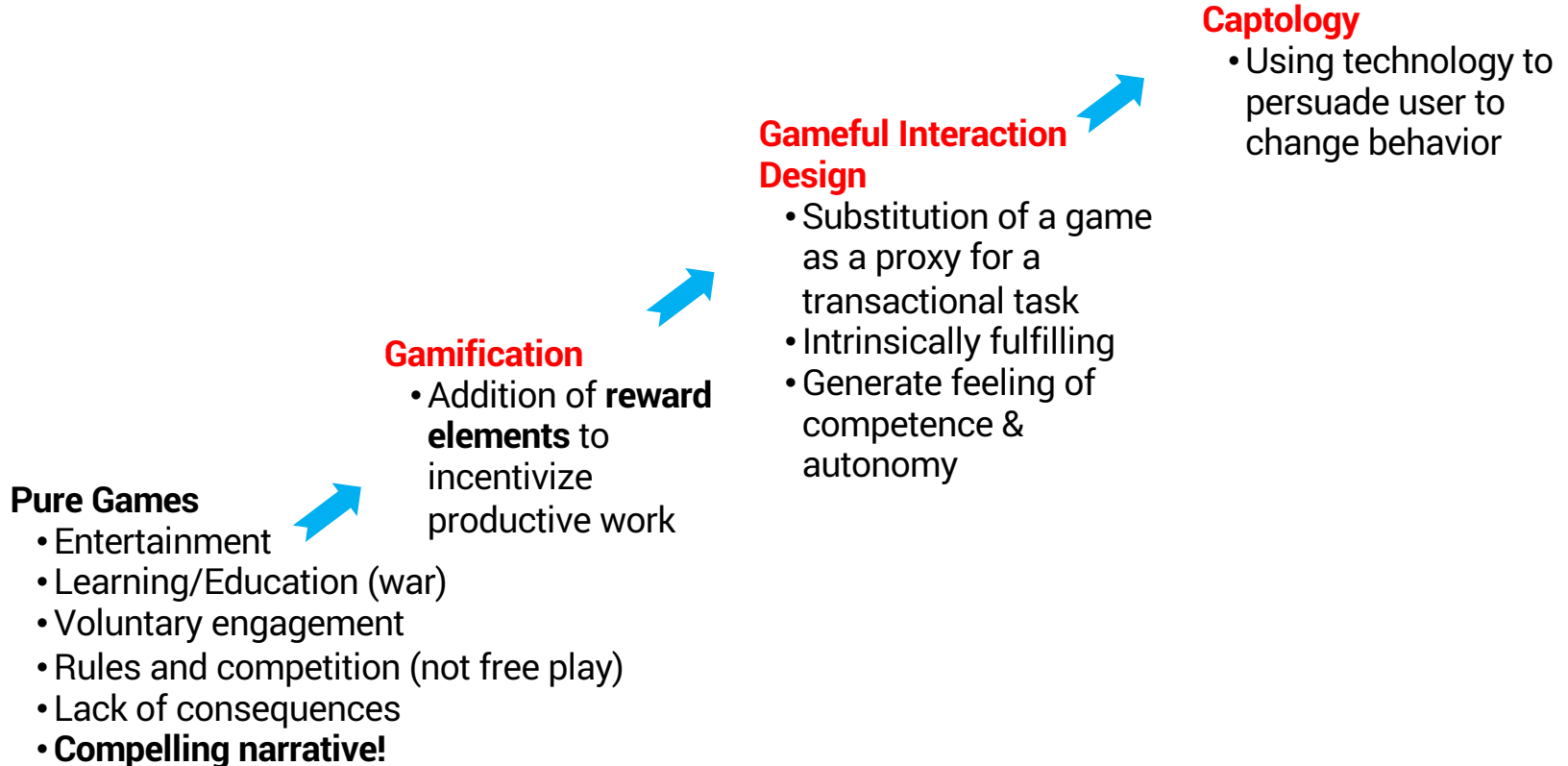
Layer 4 - Game Theory



Use today:

Can you **motivate and guide human behavior** to favor **specific object-action pairs** (aka tasks)?

Game Theory for Interaction Design is part of UX Magic



Mapping to UX Magic – Conceptual Models

- **Gamification** - provides **Action** incentives
- **Gameful Interaction Design** - utilizes **Object** substitution
- **Captology** focuses on **Attribute** manipulation
 - When used in tools and online services

Reasons to Apply Game Theory in Interaction Design

Increasing	Decreasing
Productivity	Errors
Performance	Boredom during repetitive tasks
Satisfaction	Unsafe behavior
Sales/Revenue	Energy consumption
Community size	Gambling
Health and well-being	Conflict
Sustainability	Absenteeism

Incentivizing user tasks (object-action pair)

Human **Motivators** to target

Intrinsic

Autonomy

Belonging

Creativity

Curiosity

Learning

Love

Mastery

Meaning

Pleasure

Extrinsic

Benefits

Bonus/Reward

Competition

Fear of failure

Fear of loss

Fear of punishment

Greed

Praise

Status

Game Mechanics

Achievement

Connection

Constraints

Feedback

Narrative

Ownership

Privilege

Reciprocity

Recognition

Role play

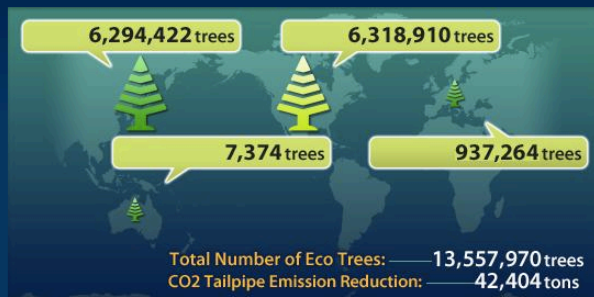
Self Expression

Sports

Urgency

World Eco Forest

Eco Trees acquired by drivers around the world



Change Map View Graph

Home

Eco tree is a virtual tree. Not intended to represent planting or saving an actual tree.

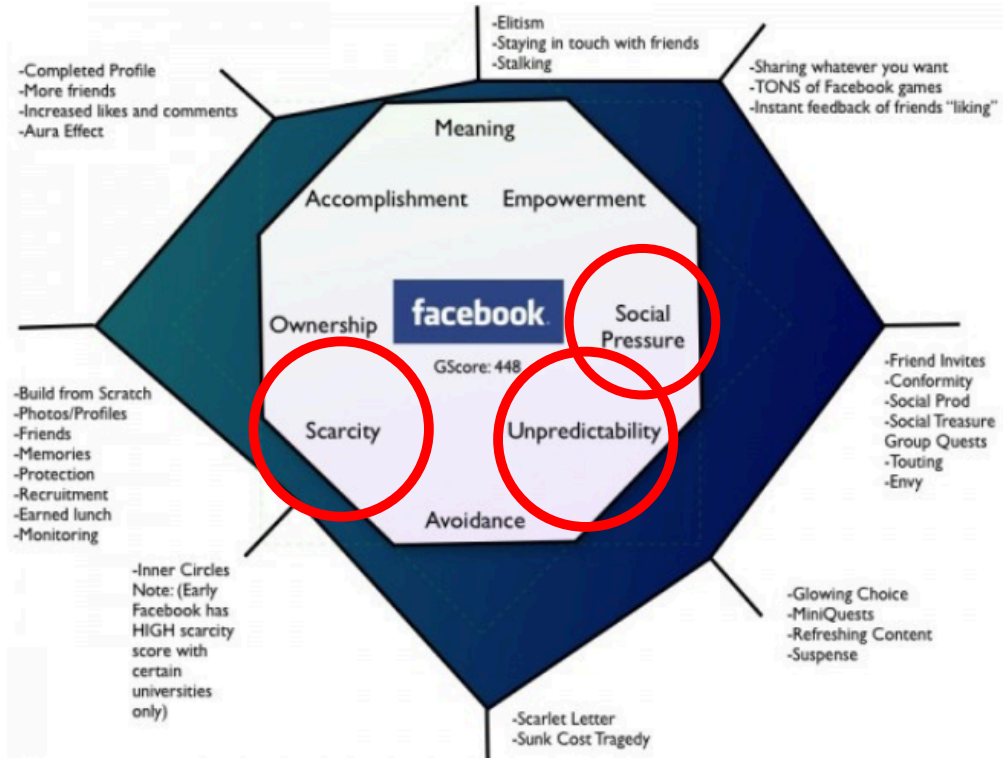
Intrinsic

Extrinsic

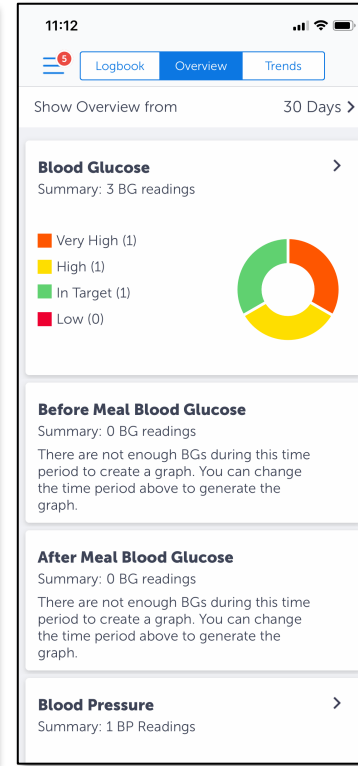
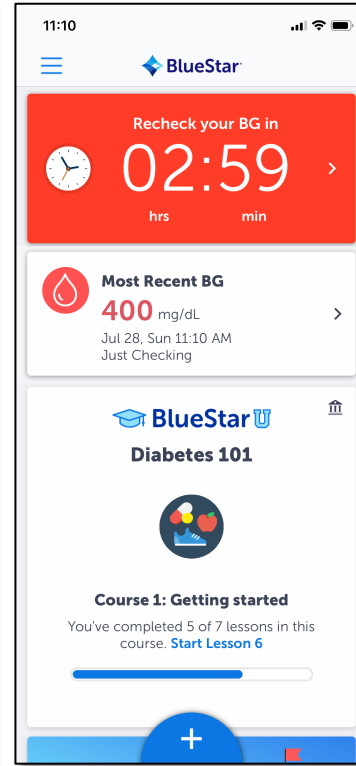
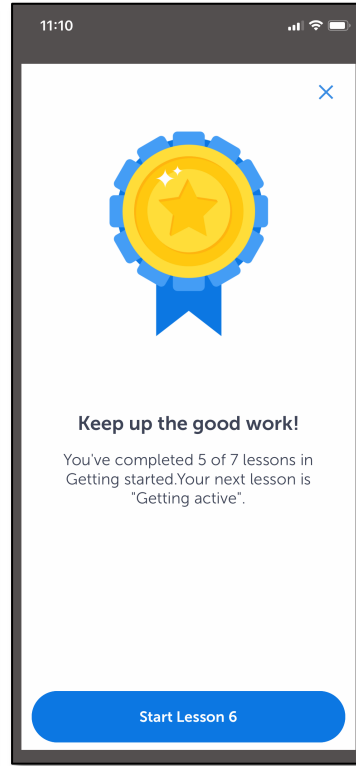
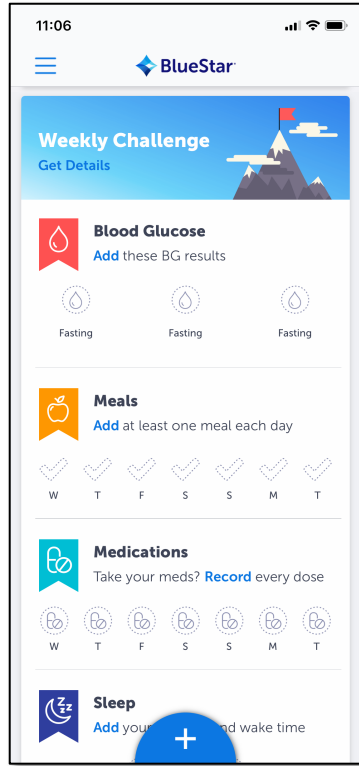
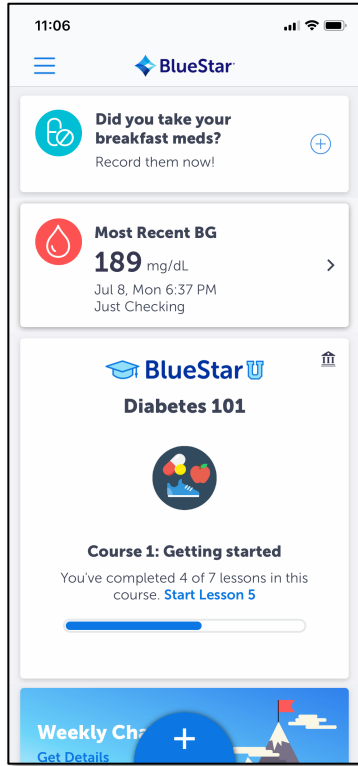
Autonomy	Benefits
Belonging	Bonus/Reward
Creativity	Competition
Curiosity	Fear of failure
Learning	Fear of loss
Love	Fear punishment
Mastery	Greed
Meaning	Praise
Pleasure	Status

Team competition
(Social connection)

Game Theory is everywhere



Interaction Design can outperform medication



BlueStar – Diabetes Solution from WellDoc Inc.



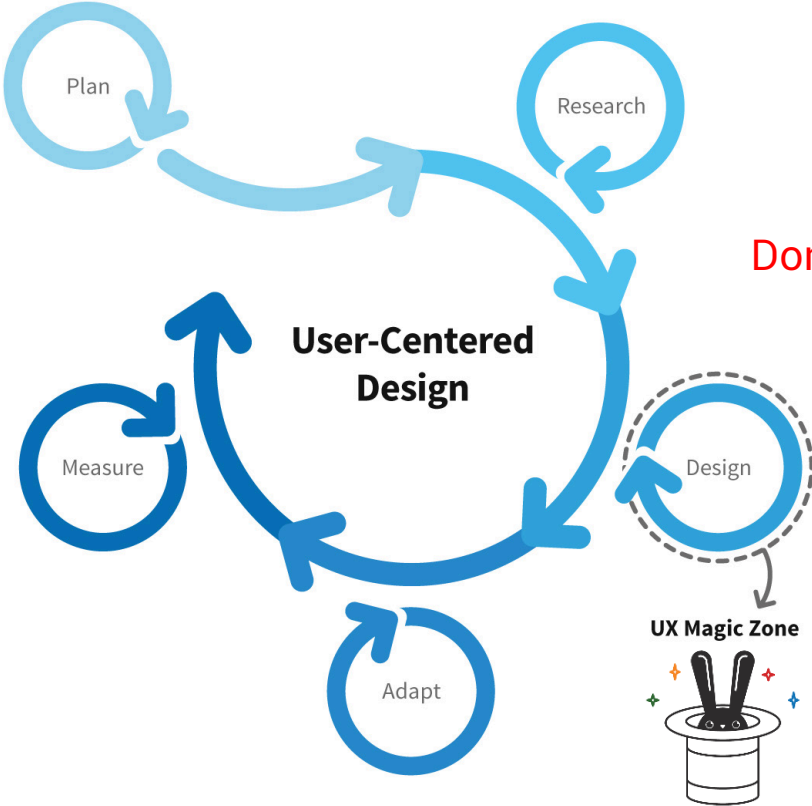
dan@rCDOUX.com

End of Preview

- What
- When
- Why
- How

Semantic Interaction Design

Semantic IxD – **Only Interaction Design** step



Don't forget to do the other UCD Steps!

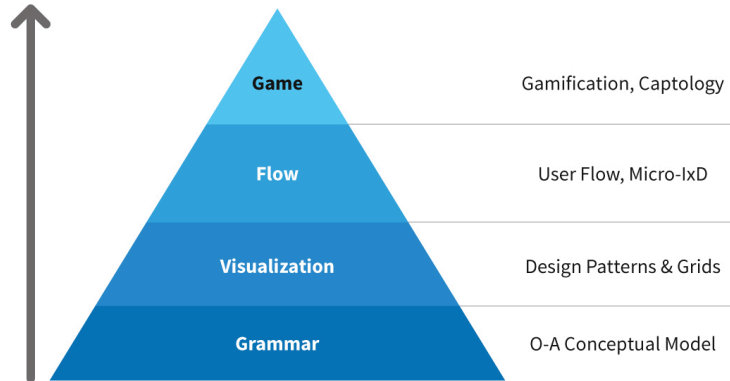
Semantic Interaction Design Framework

We have completed our **preview** of the Semantic Interaction Design core – **but there is much more....**

Chapter 10 – **Chess** (future of UX design & designers)

Chapter 9 – **Myth** (UI style guide applicability)

Chapter 8 – **Elegance** (graphic design for Semantics)



Preview Chapters 4–7



Preview Chapters 1–3

UX Magic – Book by the Interaction Design Foundation



We only **scratched the surface** of the Semantic Interaction Design topic.

To dig in deep:

- Get the book
- Study it
- Do the related exercises
- Teach the method to others...

You can purchase this new book from the Interaction Design Foundation on [Amazon](#)

Addendum

For individuals:

- If you found this new Semantic IxD approach compelling please **tell your UX colleagues** at other companies about it. **Post on social media** and help spread the word within the global UX design community.
- Join the Interaction Design Foundation (the publisher) and learn more about IxD in general...

For UX leaders/manager:

- I have been giving corporate training classes on this the Semantic IxD method for years
- It includes how it integrates into **Data Visualization** and **Information Architecture** which are not covered in the book.

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INTERACTION DESIGN
FOUNDATION

The End – Q&A

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