Of Constraints and Capabilities

applying systems thinking to design the ideal experience

#systhink

presented by **Dante Murphy** and **Angel Brown**, Digitas Health User Experience

TITLE

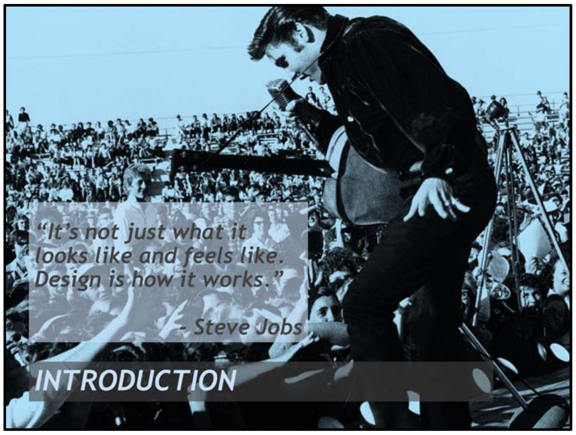
Why this photo? This clean-up crew, self organized over twitter, helped to clear debris from the Clapham tube station in the aftermath of recent rioting in London. Their effort underscores the themes of our presentation.

1. *That the capabilities of a system like twitter can be used for change, both positive and negative*
2. *That constraints, such as the limited manpower available to repair damage and restore function, became an opportunity*
3. *That approaching the problem systemically enabled an idealized outcome*

<ANGEL>

This morning's keynote was about the idea of a design system based upon a set of universal principles but the nature of the web as a transactional system, one in which users DO things, means that we have to establish the functional framework of the system before we apply the presentation layer.

That's where the UX people come in. Like us.



“It’s not just what it looks like and feels like. Design is how it works.”

- Steve Jobs

INTRODUCTION

Introduction

Angel is the director of UX at Digitas Health in London…

<ANGEL to contribute here>

Dante is the Global Experience Director…

Digitas Health is an agency dedicated to helping clients transform healthcare marketing.

One of the ways we are doing that is by taking a new approach to design.

WHAT DO WE STRIVE FOR IN DESIGN?

Straw poll of participants (write down notable responses, if possible)

What do we strive for in design?

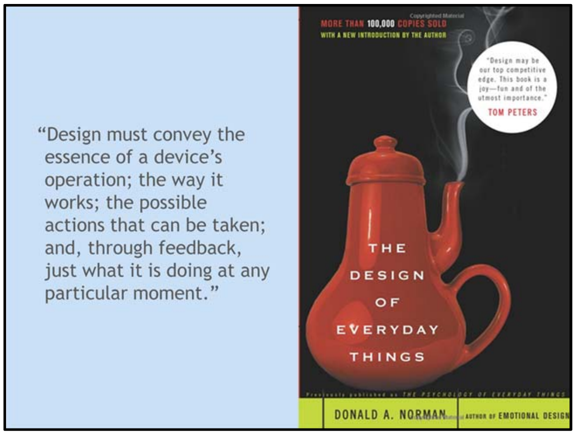
What are the unifying principles that guide our process and decisions?

How do we avoid truly epic failure?

This image, for those who don't know, is one of the most celebrated failures in modern design, the Edsel.

The Edsel offered several innovative features, among which were its "rolling dome" speedometer and its Push-button Teletouch transmission shifting system in the center of the steering wheel. Other Edsel design innovations included ergonomically designed controls for the driver and self-adjusting brakes (which Edsel claimed as a first for the industry, even though Studebaker had pioneered them earlier in the decade).

In some cases, the ideas were good, but most were not. They were just things they did because they could, with no understanding of what their audience would do with them.



"Design must convey the essence of a device's operation; the way it works; the possible actions that can be taken; and, through feedback, just what it is doing at any particular moment."

MORE THAN 100,000 COPIES SOLD
WITH A NEW INTRODUCTION BY THE AUTHOR
"Design may be our top competitive edge. This book is a joy—fun and of the utmost importance."
TOM PETERS
THE DESIGN OF EVERYDAY THINGS
Previously published as THE PSYCHOLOGY OF EVERYDAY THINGS
DONALD A. NORMAN
AUTHOR OF EMOTIONAL DESIGN

FUNCTION

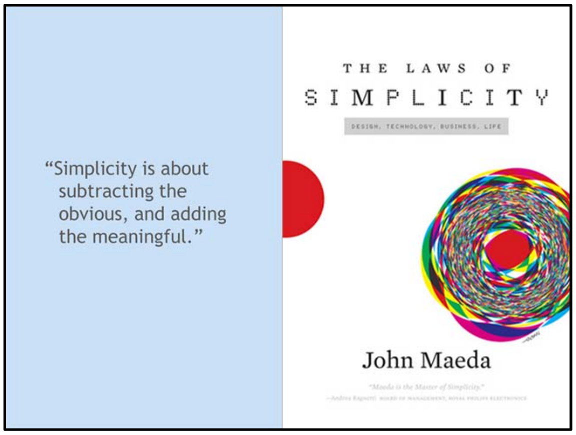
We've learned that things must not only possess the attributes of functionality, they must actually function in context.

Unless a design is purely aesthetic…and I would hesitate to call that a design, instead I would call it "art"…it must achieve some function or tangible goal.

<ANGEL>

In some cases, especially when technology products are immature, the functions become the design.

Applying FOCUS to functionality helps products mature and become more meaningful to their users.



"Simplicity is about subtracting the obvious, and adding the meaningful."

THE LAWS OF
SIMPLICITY
DESIGN, TECHNOLOGY, BUSINESS, LIFE
John Maeda
"Maeda is the Master of Simplicity."
—Andrea Ragnetti, BOARD OF MANAGEMENT, ROYAL PHILIPS ELECTRONICS

SIMPLICITY

[KEY FACTOR]

We define simplicity not as a lack of sophistication, but as the outcome of prioritizing the needs of the customer.

The essence of simplicity goes beyond understanding the needs of your customer. It requires an astute focus on those needs, including the non-functional needs that feed delight and loyalty.

"The highest type of efficiency is that which can utilize existing material to the best advantage."

- Jawaharlal Nehru

EFFICIENCY

[KEY FACTOR]

Designers are accustomed to focusing on processes to find efficiencies that are within their control.

We seek efficiency because resources are scarce; both our design resources and the our customers' means to acquire our products.

But functionally, efficiency is most affected by accounting for and activating external capabilities.

"...you need to enter into any design project with that Zen learner's mind of 'I don't know what I don't know.'"

- Kim Goodwin

DEFINING THE SYSTEM

DEFINING THE SYSTEM

These attributes of design are also ways of describing a system.

<ANGEL>

It's difficult to characterize one part of a website, such as a block, as efficient if the navigation is incomprehensible or the login is unresponsive.

Therefore, we want the system to express those desired attributes.

So what is a "system"?

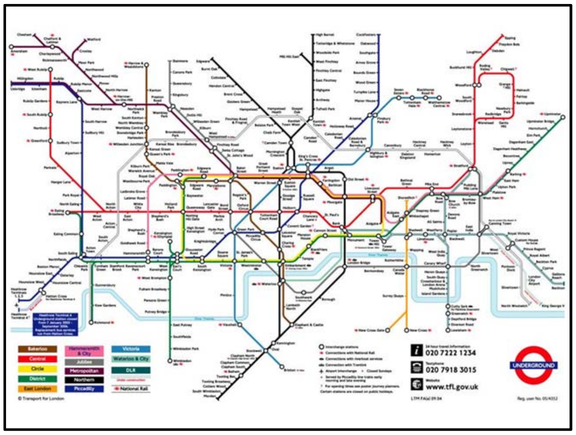
WHAT ARE THE ELEMENTS OF A SYSTEM?

There are many kinds of system in the real world…political, economic, ecologic, technical, social.

<ANGEL>

In the Drupal context, a project is a system made up of a core platform, themes, modules, content, and publication process, all managed by people and complicated by the flow of information.

Both kinds are highly complex…many moving parts, dependencies, and sometimes conflicting objectives.



FUNCTIONS

Functions describe what the system by itself can do.

Absent the introduction of external capabilities, such as “walking” and “good restaurant” this system would be of little use or interest to anyone.

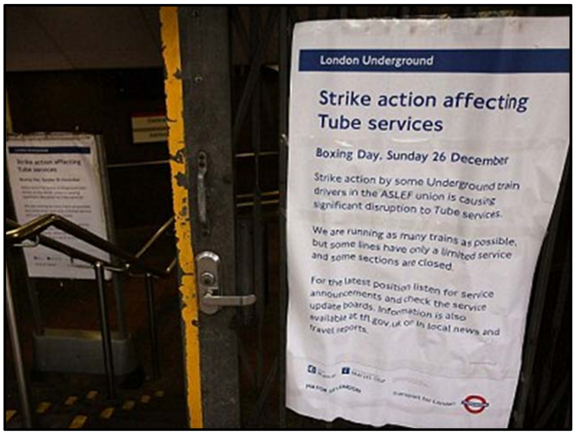
RELATIONSHIPS

Relationships contextualize function, and help to define what is possible at a given moment.

<ANGEL>

From a UX perspective each block communicates something to the users, e.g. having a login block in the default spot on the home page says 'this is a community' so if they aren't ready to make an investment they might go elsewhere. If you remove that block and just leave the link to sign up in context they might engage with the content first and then when the decision appears to join, they think it's worth the investment.

It's a way of achieving EFFICIENCY through design.



London Underground

Strike action affecting Tube services

Boxing Day, Sunday 26 December

Strike action by some Underground train drivers in the ASLEF union is causing significant disruption to Tube services.

We are running as many trains as possible, but some lines have only a limited service and some sections are closed.

For the latest position listen for service announcements and check the service update boards. Information is also available at tfl.gov.uk or in local news and travel reports.

INFLUENCES

Influences may change the way a system is used, including rendering the system non-functional

ANCILLARY FUNCTIONS

One of the key factors in a product is “what else” it does…perhaps you might choose one station over another because it has a shop where you can get breakfast, or pick up an anniversary card…on your anniversary.

<ANGEL>

The choices of additional modules we plug in has long aligned with principles of simplicity, i.e. avoiding bloatware. You don’t want additional code slowing performance down. Consider your users’ attention like a performance metric, and you will see which features creates barriers for users to get over as they try to use the pages and which represent a value-added service. It’s the same principle.

<DANTE>

Consider the first phone you owned that had a camera in it…it may have seemed gratuitous at the time, but now it’s nearly impossible to find a phone without one. That “ancillary” feature has now become a de facto requirement.

EMOTIONAL DRIVERS

It may be hard to imagine changing your behavior because of the musician on the subway…but what if he were amazingly good? Or shockingly dreadful?

<ANGEL>

Taken in a digital services context, it's possible to see how emotional factors like delight or apprehension can impact the digital news service we use or the way we do our banking on a mobile device.

OFFLINE CAPABILITIES

A big part of designing an effective system is understanding your relationship to other systems that users are likely to interact with.

The alternative would be to dig a new tube station every 100 meters, which would not only involve a lot of digging, it would also slow service because of all the additional stops.

<ANGEL>

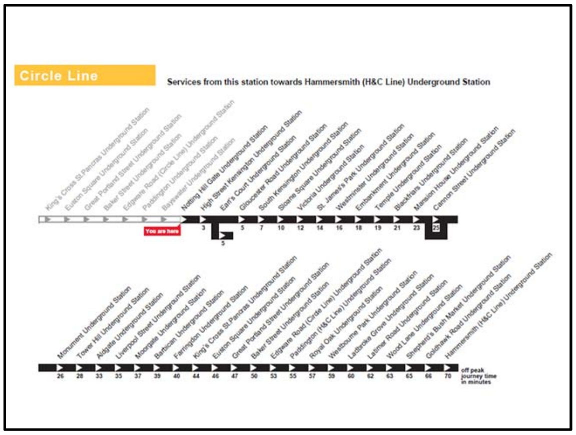
And then we're talking about bloat again.

“"Always design a thing by considering it in its next larger context -- a chair in a room, a room in a house, a house in an environment, an environment in a city plan.“

- Eliel Saarinen

ENVIRONMENT

Environment is a major factor in system design, whether it’s accounting for glare on your tablet device or being aware of the reasons someone might use your service.


Circle Line
Services from this station towards Hammersmith (H&C Line) Underground Station
King's Cross St.Pancras Underground Station
Euston Square Underground Station
Great Portland Street Underground Station
Baker Street Underground Station
Edgware Road (Circle Line) Underground Station
Paddington Underground Station
Bayswater Underground Station
Notting Hill Gate Underground Station
High Street Kensington Underground Station
Earl's Court Underground Station
Gloucester Road Underground Station
South Kensington Underground Station
Sloane Square Underground Station
Victoria Underground Station
St. James's Park Underground Station
Westminster Underground Station
Embankment Underground Station
Temple Underground Station
Blackfriars Underground Station
Mansion House Underground Station
Cannon Street Underground Station
You are here
3
5
5
7
10
12
14
16
18
19
21
23
25
Monument Underground Station
Tower Hill Underground Station
Aldgate Underground Station
Liverpool Street Underground Station
Moorgate Underground Station
Barbican Underground Station
Farringdon Underground Station
King's Cross St.Pancras Underground Station
Euston Square Underground Station
Great Portland Street Underground Station
Baker Street Underground Station
Edgware Road (Circle Line) Underground Station
Paddington (H&C Line) Underground Station
Royal Oak Underground Station
Westbourne Park Underground Station
Ladbroke Grove Underground Station
Latimer Road Underground Station
Wood Lane Underground Station
Shepherd's Bush Market Underground Station
Goldhawk Road Underground Station
Hammersmith (H&C Line) Underground Station
26
28
33
35
37
39
40
44
46
47
50
53
55
57
59
60
62
63
65
66
70
off peak journey time in minutes

TIME

Time is also a critical factor. Whether or not your system is time sensitive, chances are your users are. They want to get home as quickly as possible, whether it's 5:00 or past midnight.

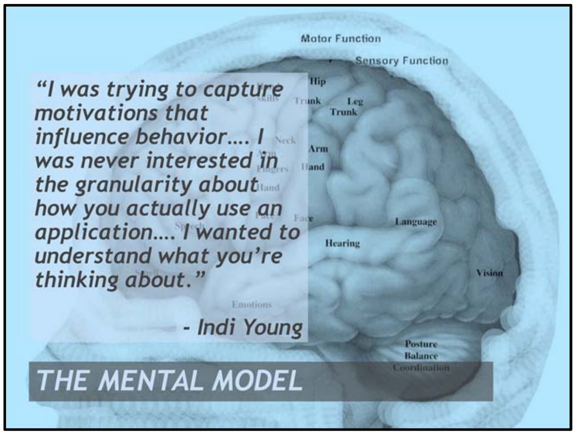
APPEARANCE

They way a thing looks triggers a visceral emotional reaction, but it can also trigger a functional reaction. What people see first establishes their context for the rest of the experience, and what they can't see, they can't use.

<ANGEL>

People used to say all Drupal sites look the same – this was because the people putting them together only thought of theming [or skinning], not of designing the user experience around the mental models of the users. Theming is not the same as designing. Look at Drupalmuseum.com – every one of those sites had a designer involved.

Taking the mental models as a starting point we designers use constructs like 'experience principles' to help us communicate what the site or application feels like to use. We get there via rich user profiles, mood boards and benchmarking just to name a few of our tools. We need the developers at the table to provide the constraints and the opportunities in Drupal because they are not easily accessible to us. If you are a themer looking to improve your designs your task is to suspend what you know about Drupal whilst you use these tools and put the user and the mental model front and centre. When you have the vision then back it into Drupal.



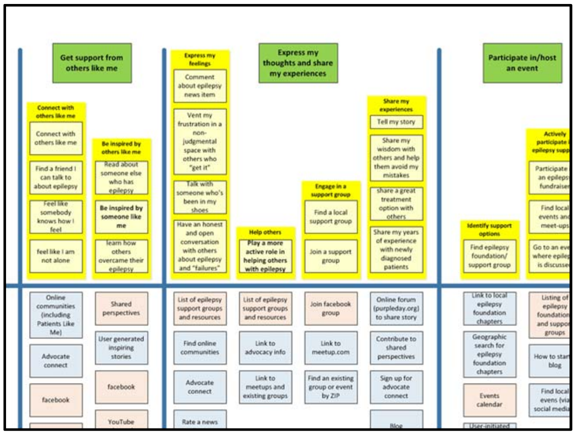
"I was trying to capture motivations that influence behavior…. I was never interested in the granularity about how you actually use an application…. I wanted to understand what you're thinking about."

- Indi Young

THE MENTAL MODEL

THE MENTAL MODEL

Each of the system elements becomes a dimension of the customer's Mental Model.


Get support from others like me
Connect with others like me
Connect with others like me
Find a friend I can talk to about epilepsy
Feel like somebody knows how I feel
feel like I am not alone
Be inspired by others like me
Read about someone else who has epilepsy
Be inspired by someone like me
learn how others overcame their epilepsy
Online communities (including Patients Like Me)
Advocate connect
facebook
Shared perspectives
User generated inspiring stories
facebook
YouTube
Express my thoughts and share my experiences
Express my feelings
Comment about epilepsy news item
Vent my frustration in a non-judgmental space with others who "get it"
Talk with someone who's been in my shoes
Have an honest and open conversation with others about epilepsy and "failures"
Help others
Play a more active role in helping others with epilepsy
Engage in a support group
Find a local support group
Join a support group
Share my experiences
Tell my story
Share my wisdom with others and help them avoid my mistakes
share a great treatment option with others
Share my years of experience with newly diagnosed patients
List of epilepsy support groups and resources
Find online communities
Advocate connect
Rate a news
List of epilepsy support groups and resources
Link to advocacy info
Link to meetups and existing groups
Join facebook group
Link to meetup.com
Find an existing group or event by ZIP
Online forum (purpleday.org) to share story
Contribute to shared perspectives
Sign up for advocate connect
Blog
Participate in/host an event
Identify support options
Find epilepsy foundation/ support group
Actively participate i epilepsy supp
Participate an epileps fundraiser
Find local events and meet-ups
Go to an eve where epilep is discusse
Link to local epilepsy foundation chapters
Geographic search for epilepsy foundation chapters
Events calendar
User-initiated
Listing of epilepsy foundation and suppor groups
How to start blog
Find local evens (via social media

WHAT IS A MENTAL MODEL?

<ANGEL>

Mental models are made up of user tasks and goals independent of the design or even the existence of the system. It is by comparing behaviors, both those that are exhibited and those that are absent, to the mental model that meaningful design can take place.

<DANTE>

In nearly every case, because of offline capabilities and ancillary functions, a mental model is larger than the system that necessitated or inspired it.

"I saw the angel in the marble and carved until I set him free."

- Michelangelo

MENTAL MODELS
Aligning Design Strategy with Human Behavior
by INDI YOUNG foreword by Jeff Veen
Rosenfeld

APPLIED MENTAL MODEL

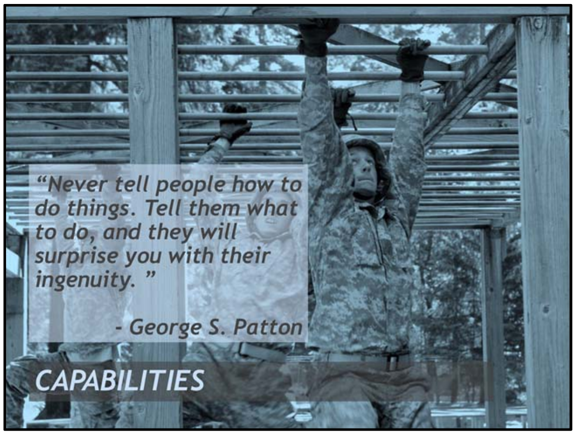
Applied to define functional and experiential requirements

Understanding what the customer's requirements are…functional and emotional…gives us a target to design for.

Once the user's mental model is understood and documented, our design can account for their needs, values, feelings, and desires within and beyond the system we are creating.

<ANGEL>

Part of this is mapping capabilities to the documented customer tasks and goals.



"Never tell people how to do things. Tell them what to do, and they will surprise you with their ingenuity. "

- George S. Patton

CAPABILITIES

CAPABILITIES

The most important part of this "target for design" are the capabilities because they are inevitably how you design is judged…by the client, the market, and the individual consumer.

The first question anyone asks about a thing is, "what does it do?"

HOW DO WE DEFINE AND DOCUMENT CAPABILITIES?

<ANGEL>

What can the product or service do for its users? And what can they do for themselves?

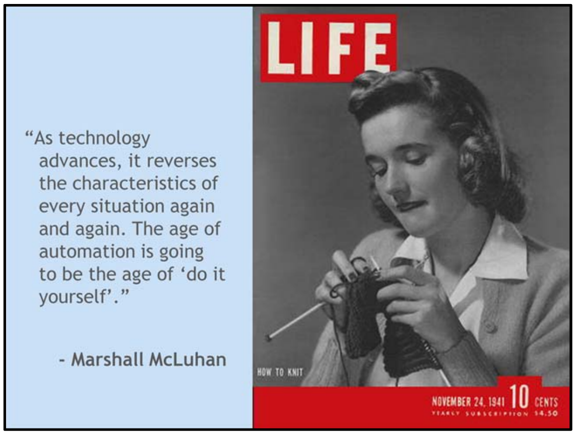
In the context of Drupal, this might be the functions, themes, content, and data model.

<DANTE>

But in the systems thinking context, it includes much more…governance, partnerships, community, and regulations.

And, of course, what users can and will do for themselves.

This frequently become a dichotomy between what the business wants and the way a product or service is actually consumed.



"As technology advances, it reverses the characteristics of every situation again and again. The age of automation is going to be the age of 'do it yourself'."

- Marshall McLuhan

USER CAPABILITIES

[KEY FACTOR]

For now, we're going to ignore the capabilities of the system, not because they are unimportant, but because they are usually obvious and often dictated in a requirements document.

Instead, we're going to look into what users can (and will) do for themselves, and why.

Some of the reasons people do things for themselves, or in their own way, are:

- *Expression*
- *Personalization*
- *Pride*
- *Challenge*
- *Cost*
- *availability of resources*
- *Innovation*

<ANGEL>

This influences the blocks we include, and the way they are presented…priority, context, and grouping.

SELF-SUFFICIENCY

Why are there stairs in a high-rise?

They are of course required for fire safety, but they also see a lot of use from those who are in a hurry, or want to stretch the legs a bit, or because the lift is on the other side of the office

COLLECTIVISM

Somehow, every presentation I do ends up having an image of a barn raising in it. But even for those of us who are not Amish…which I imagine is everybody here…we can all recall instances where coming together as a community was more rewarding, and perhaps more important, than building or making whatever brought the group together.

And if you don't believe me, consider this….earlier this year, Google considered buying twitter for $10 Billion dollars. Social media is the digital realization of collectivism.

<ANGEL>

As web designers, the pool of functions and features is often the same but each context is different. For example drawing from my own experience, logging how many good days you've had where your ulcerative colitis hasn't had a serious impact on your life may be something you want to track and celebrate but might not be something that you want to share with the rest of the community. On the other hand, logging the number of miles you've cycled on the weekend is definitely something you want to not only share with the community but also tweet out to the world at large. Sharing is a minefield as we all know from Google's experiences with Buzz. Drupal sites often make use of social features and this provides deep opportunities for engagement (e.g. Facebook and dating) but only if you understand how the functions map to the underlying motivations. I was involved with another project recently about clothes swapping – under which circumstances do users want to package up their old clothes and put them online? What are the barriers? If I put up an ugly jumpsuit will this affect my reputation in the community?

ACTIVISM

The logical confluence of self-sufficiency and collectivism, especially in a socially conscious context, is activism. People taking responsibility, taking action, to change their world.

Imagine how differently something like the American Civil Rights movement would have been with the power of Google+.

“Design depends largely on constraints.”

- Charles Eames

CONSTRAINTS

CONSTRAINTS

Understanding the capabilities that exist beyond the system boundary (real or perceived) can both create and destroy constraints.

It creates constraints that provide focus and clarity on where we spend our design efforts and resources.

It also eradicates constraints by identifying alternatives at the individual, group, and community level.

HOW DO CONSTRAINTS HELP US?

In order to answer this questions, we must first identify and avoid self-imposed constraints

Review your project assumptions and see which are helping and which are not.

If a constraint is not helping by defining your problem or making the solution set more manageable, then challenge it.

<ANGEL>

Take the example of the camera. If you were trying to reduce the cost of taking photographs, the natural assumption would be to reduce the price of the camera, or perhaps the film. But if you challenge the assumption that there even has to be film, you can eliminate a major recurring cost.

FOCUS

[KEY FACTOR]

All that remains, then, is the "trivial" problem of inventing the digital camera.

Constraints are most helpful when they allow us to FOCUS the design of our system on the most meaningful problems our customers face that they can't solve effectively on their own.

Once we've successfully introduced the digital camera and eradicated the need for film, it's time to find the next artificial constraint. For example, that a camera can only take still images.

Consider who owns most of the cameras in the world. It's not professional photographers. Tourists, lunch-hour hobbyists, and doting parents are just as likely to desire a short video clip as they are a well composed snapshot.

Do they need to carry two cameras wherever they go? With the advent of the feature-rich smartphone, do they even need to carry one?

<ANGEL>

This illuminates one of the unspoken nagging problems of agile, that it is always additive. One of the most important things a designer can do, and by extension the developer that instantiates that design, is to take things away.

PRIORITIZATION

Still, some constraints are helpful, especially those which help us prioritize solutions or workstreams.

Developers and designers both know that everything is important. By the time you've talked to every stakeholder, every feature in the requirements matrix is labeled "high". If it wasn't important under some circumstance, it never would have made it this far. But as we apply constraints of context and resources, the mitigating conditions diminish and prioritization becomes much more clear.

<ANGEL>

This FOCUS is one of the key attributes of successful systems.

"FLOW"

Eliminating what the system CAN'T do effectively keeps the experience cognitively efficient and engaging.

Eliminating what the system SHOULDN'T do enhances control and simplicity.

Leaving room for the user to apply their own capabilities activates and engages them.

Proposed by Mihály Csíkszentmihályi, "flow" is completely focused motivation. It is a single-minded immersion and represents perhaps the ultimate in harnessing the emotions in the service of performing and learning. In flow, the emotions are not just contained and channeled, but positive, energized, and aligned with the task at hand. The hallmark of flow is a feeling of spontaneous joy, even rapture, while performing a task.

This is the result of embracing constraints as a means of enabling idealized design.

"If you wait for ideal circumstances in which you have all the information you need (which is impossible) the market will pass you by."

- Guy Kawasaki

IDEALIZED DESIGN

IDEALIZED DESIGN

Defining the system and mapping the capabilities and constraints gives us all the data we need to create the design. But how do we create the best design? And what makes a design IDEALIZED?

Note:

This is the book I mentioned in the presentation:

http://www.amazon.com/Idealized-Design-Dissolve-Tomorrows-Crisis-Today/dp/0131963635

Idealized Design: How to Dissolve Tomorrow's Crisis…Today

By Russell Ackoff

ABSOLUTION

There are four levels of ideal in addressing problems, and the one that offends us is also the most common: absolution.

The belief that a problem is “not my problem”, or that it will go away on its own, arouses suspicions of laziness, complacency, and stupidity. But it’s really a sociological phenomenon.

<ANGEL>

The success of a society depends on people solving problems beyond their assigned role, beyond their own self-interest. That’s why we applaud grassroots volunteer efforts, because they demonstrate the triumph of capabilities over self-imposed constraints to achieve a common goal.

RESOLUTION

The most common way of addressing a problem is to attack the most obvious symptom head-on. But focusing on the symptoms rather than probing to the underlying cause often leads to temporary and unsatisfactory resolution.

<ANGEL>

Here the symptomatic resolution is to carry an umbrella while riding the scooter, but maybe riding the bus would have been a better idea? And if we eliminate the constraint that says we have to own a scooter, we can propose that the customer buy a car instead, not only solving the immediate problem but making it impossible for the problem to recur.

SOLUTION

<ANGEL>

What many designers strive for is the opportunity to understand the cause of a problem and address it before the problem can manifest.

This requires an understanding of how a product or service is used, a study of reported defects, and some creative problem-solving in how to avoid recurring situations. Still, the investment is often worth it in differentiating from competitors or delivering more efficient operation.

<DANTE>

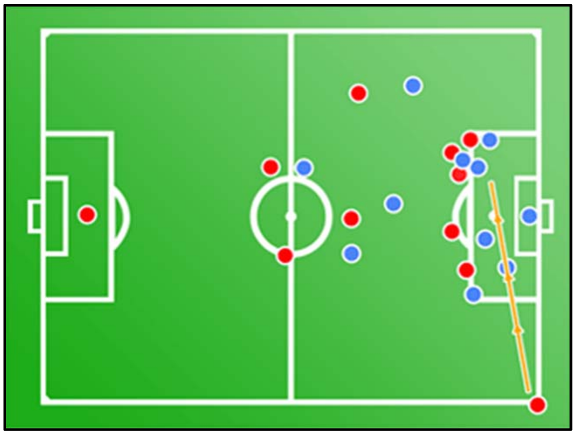
Looking at this rail crossing, it's easy to see how this might be a place where a collision could occur. Installing safety barricades that are activated when a train approaches would alert motorists to the danger.

But is there still a better solution? What if the road never crossed the tracks?

DISSOLUTION

Dissolution is the highest order way of addressing a problem. While solution prevents the problem from re-occurring in the same way, dissolution examines the whole system and seeks a way to eliminate the possibility of the problem.

Could the tracks be elevated? Do we even need this road, or this train line?



SYSTEMS THINKING AND AGILE

<ANGEL>

In web development we are often using agile so what does this mean for a systems thinking approach? UX struggles and often winds up trying to stay one sprint ahead of the dev team. I personally have found it very difficult to get the dev team to engage on holistic issues because this way of thinking seems to stand in opposition to an agile approach. But this needn't be true. A proof of concept can be a parallel development alongside the UX exploration if treated as a prototype. Tackling the system-wide problems first in microcosm on a single case can help drive the emerging vision even if it is never documented as such.

RECONCILING AGILE

While it’s important to have a plan to follow, it’s equally important, and useful in a rapidly changing environment, to be able to react instantly and confidently. The basis for this is a set of clear, well-founded design principles like those we’ve discussed.

SUMMARY

In a marathon, there is no "perfect run". There will always be someone who will go faster. But it doesn't take perfection to win.

The idealized design should use all of the resources available within the project time frame to achieve the outcome closest to dissolution.

The tools that can get you there are SIMPLICITY in objective, the EFFICIENCY afforded by maximizing external capabilities, and the FOCUS granted by the righteous application of constraints.

Thanks.

tweet us up...#systhink

@dantemurphy and @angelbrownuk

THANKS!

Johnny Cash and June Carter Cash

Questions answered by this session

What is systems thinking, and why is it important?

How does an idealized design differ from other types of design?

How can a mental model help in designing and architecting software?

Why are constraints good?

How do I know what my audience can and will do for themselves?