

Autodesk®

IDEAS

THE INNOVATION
+ DESIGN SERIES

REIMAGINING MANUFACTURING:
*THE TECHNOLOGIES DRIVING THE
NEW INDUSTRIAL REVOLUTION*

MAY 22-24, 2011 * SAN FRANCISCO, CA

IDEAS

THE INNOVATION + DESIGN SERIES

THE TECHNOLOGIES DRIVING THE *New* INDUSTRIAL REVOLUTION

Autodesk MAY 23-24, 2011

- POSE QUESTIONS.
- SEEK ALTERNATIVES.
- MAKE CONNECTIONS.
- EXPLORE THE POSSIBILITIES.

BRINGING PEOPLE TOGETHER ON THE DEEP TOPIC AND IMPACT OF THE NEW TECHNOLOGIES DRIVING THE NEW INDUSTRIAL REVOLUTION.

...AND WE NEED TO ADDRESS THE BIG QUESTIONS.
THE WORLD IS MOVING FAST!

1 DIGITIZED REALITY
PROVIDING A DIGITAL VISION OF OUR WORLD.

2 INFINITE COMPUTING
NOW THAT WE HAVE A DIGITAL VISION OF OUR WORLD, WHAT DO WE DO WITH IT?

3 DIGITAL MODELS
ALLOWING FOR LOCAL PRINTING OF PRODUCTS. IS THIS THE NEW SCAN/PRINT MODEL?

3 CORE GAME CHANGING TECHNOLOGIES

SOME OF THE QUESTIONS

- OPPORTUNITIES?
- STANDARDIZATION?
- BUSINESS MODELS?
- SUSTAINABILITY?
- CREATING EVERYTHING WE NEED?
- WHICH TECHNOLOGIES WILL RADICALLY CHANGE OUR WORLDS?
- WILL MONEY MATTER WHEN PRODUCTION IS FREE?
- HOW DO WE ADD SOUL TO THE PRODUCTION PROCESS?
- SHOULD DESIGN BE DEMOCRATIZED?

...KEEP IN MIND THAT TECHNOLOGY IS JUST 1 OF MANY DRIVERS...

WHERE IS OUR LONG-TERM FUTURE?

...WE ARE CREATING A PEER GROUP HERE TO HAVE CONVERSATIONS REGARDING

WHERE WE GO FROM HERE?

...SEPERATING THE HYPE FROM

WHAT IS REAL...

WHAT ARE OUR QUESTIONS?

WHAT ARE THE IMPLICATIONS OF THESE TECHNOLOGIES UPON OUR WORLD?

THE REVOLUTION IN MANUFACTURING

WITH BUD KOUCH FISCHER-PRICE

"NONE OF US KNOW AS MUCH AS ALL OF US...?"

WORLD OF WARCRAFT CUSTOMIZED ACTION FIGURES

CRITIC - M

BUILDING EXCLUSIVES:

- CUSTOMIZED FOR SPECIFIC RETAILERS
- PERSONALIZED/CUSTOMIZED BASED ON FABRIC AND FASHION.

LIMITED PRODUCTION

CUSTOMIZED GIFTS

WITH AMERICAN DOLL, YOU CAN SELECT ALL OF YOUR OWN CUSTOMIZATION LOOK, HAIR, CLOTHING, SKIN COLOR, ETC.

RAPID FABRIC PRINTING

WITH LEGOS, THE CHILD DOWNLOADS A CAD PROGRAM TO CUSTOMIZE THEIR OWN TOY.

SAVES ON PRODUCTION AND PACKING...

WITH CHRIS ANDERSON WIRED MAGAZINE

FUN FOR YOU, FUN FOR YOUR KIDS...

PLAYING WITH THE TRI-BOT KIT.

YOU CAN LOOK ONLINE TO SEE WHAT OTHERS HAVE BUILT.

A SMALL MAKER PROJECT GOING HEAD TO HEAD WITH AEROSPACE!

ONLINE COMMUNITY... WHAT IS POSSIBLE?

CREATE THE COMMUNITY FIRST.

LEGO AUTO PILOT

ATOMS ARE THE NEW BITS...

OPEN-SOURCE AERIAL ROBOTICS... WHAT DO YOU DO? IT DOESN'T MATTER WHAT YOUR BECOME IS.

DEMOCRATIZING TECHNOLOGY

MOVED TO ARDUINO PLATFORM AS AN AUTO-PILOT

OPEN-SOURCE

FASTER, CHEAPER, BETTER...

...CREATED FOR FREE BY AN ONLINE COMMUNITY... REINVENTING THE MODEL.

WITH NEIL GROSCHENTED MIT

ANALOG VS DIGITAL

RESEARCH ROADMAP

REINVENTING THE ORGANIZATION... SAVING THE GOO...

NO TRASH BY PRODUCT IN THE MANUFACTURING.

TRASH

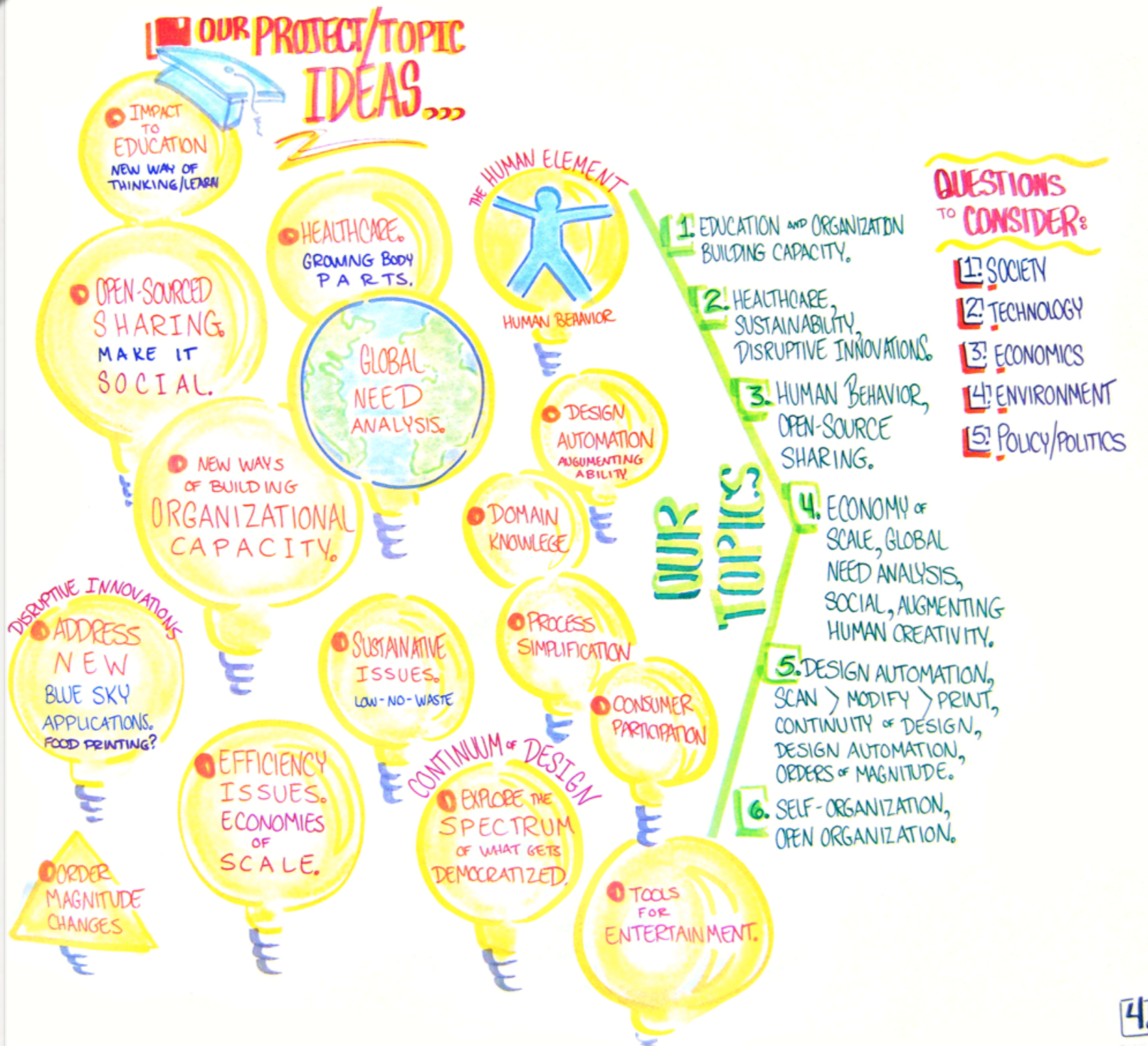
THE COMPUTER DOESN'T CONTROL THE MATERIALS... IT IS PART OF THE MATERIALS.

...THE MATERIALS CONTAIN CODE.

WE ARE ON THE TECHNOLOGICAL EDGE OF LIFE AND PLAY

THE CODE BECOMES THE OBJECT.

MACHINES MAKING MACHINES MAKING MACHINES... THEN MOVING ONTO ADDITIVE ASSEMBLY.



PANEL DISCUSSION: THE EVOLUTION OF FABRICATION

WHAT IS REAL?

- PRECISE, WHAT IS PRINTED, IS WHAT IS UTILIZED... AND THEREFORE R • E • A • L.
- ECONOMIC IMPACT/SAVINGS IS ALSO R • E • A • L.
- DEMOCRATIZING ACCESS TO THE TOOLS ACCELERATES ADAPTATION/ADOPTION OF THE TOOLS, WHICH RESULTS IN MORE MAKERS.
- THE BUSINESS MODELS WILL COME FROM THE COMMUNITY IF WE CONTINUE TO DEMOCRATIZE THE TOOLS.

- EXPANSION INTO EVERY ELEMENT OF CONSUMER LIVES...
- DIGITIZING THE MATERIAL SO IT FORMS INTO A MORE HOLISTIC SHAPE IS ESSENTIAL.
- CURRENTLY MOVING INTO SUPPLY CHAIN INTO ENDLESS MANUFACTURING.

- CONTENT CAPTURE HELPS TO FURTHER CONNECTIVITY. CONTENT CAPTURE IS REPLACING CAD AS A DESIGN STARTING POINT.
- CONVERGENCE BETWEEN SUBSTRACTIVE AND ADDITIVE.

- PEOPLE CARE ABOUT MATERIALS... IF WE CAN UTILIZE BOTH ADDITIVE AND SUBSTRACTIVE TECHNOLOGIES THIS WILL MEET MORE NEEDS.

- RATE OF TECHNOLOGY ADOPTION COULD IMPACT COMPANIES WITH LARGE INVESTMENTS IN INFRASTRUCTURE IF THE QUALITY OUTPUT AND EASE OF USE REMAINS HIGH.

- HOME FACTORIES WILL BE A VIABLE DEMOCRATIFIED VISION OF THE FUTURE... WE SHOULD EMBRACE THE OPPORTUNITY.

MY OWN CUSTOM FACTORY!

MANAGE THE CHANGE.

"How do you do that?" HAS MORPHED INTO...

"wow! IMAGINE THE POSSIBILITIES YOU CAN DO WITH THIS!"

TO FURTHER DEVELOPMENT MORE QUICKLY, SHARE INFORMATION TECHNOLOGY AND EDUCATE/PROMOTE THE POTENTIAL OUT COMES...

FOCUS, FORSIGHT, AND ANTICIPATING CONSUMER N • E • E • D • S...

THIS IS GREAT, BUT MY OPTIONS ARE SO LIMITED.

MAKE IT EASIER FOR ME TO SHARE MY WANTS.

I WANT TO MAKE WHAT I WANT... JUST FOR MY NEEDS.

CATALYSTS TO THE EVOLUTION

WE ARE GAINING MORE TRACTION, AND, SIMPLICITY = END-USE ENVIRONMENT

TREND OF SHARED SERVICES IN-HOUSE IS MAKING THIS TECHNOLOGY MORE ACCESSIBLE TO MORE GROUPS.

The tools are easier to use... you don't need to be a DESIGNER. Why even a monkey could do it!

THE CHANGING, EVOLVING, INTUITIVE USE OF THE CAD TECHNOLOGY WILL QUICKEN THE PACE OF FABRICATION EVOLUTION!

I need to get to where I want to go more quickly and easily...



AWARENESS



SIMPLICITY



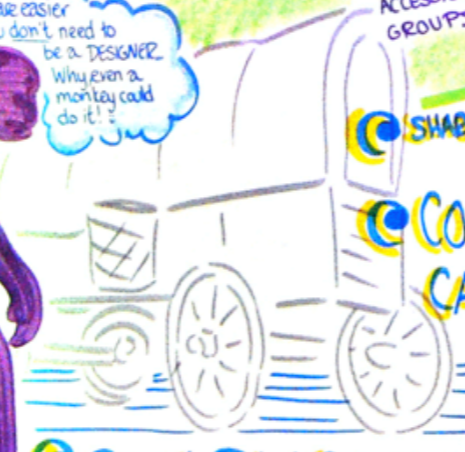
BIG THEMES

ENABLING EXPRESSION OF WANTS.

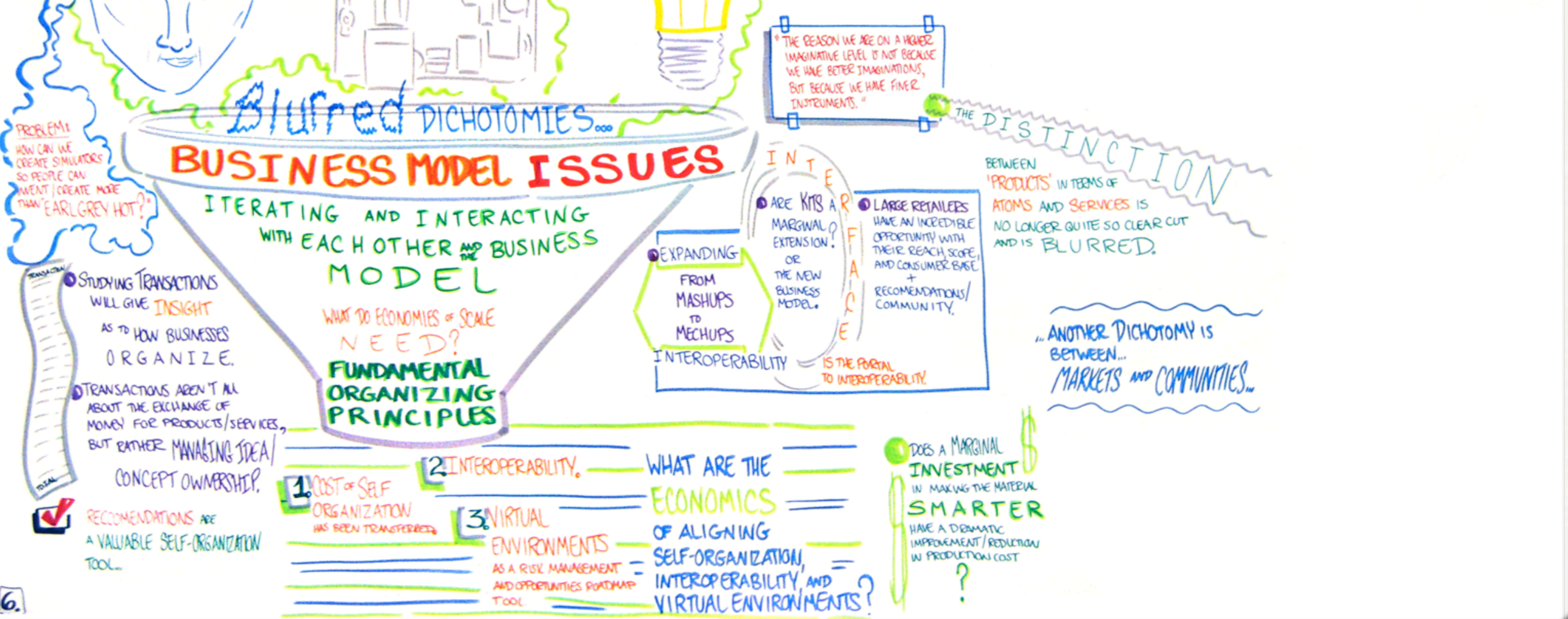
SHARED SERVICES.

CONTENT CAPTURE

COMBINATION OF ADDITIVE AND SUBSTRACTIVE



INNOVATION + Arduino Piecimila = **BUILDING THE BUSINESS CASE: THE ECONOMICS OF INNOVATION**



THE MAKER MOVEMENT

A COMMON THREAD:
TECHNOLOGIES PROMOTE ENGAGEMENT...

A COMMUNITY THAT IS DRIVEN BY PASSION...

...AND CAN BE TRANSLATED TO EDUCATION...
 GIVE PEOPLE, ESPECIALLY CHILDREN, THE OPPORTUNITY TO HAVE CONTROL OVER SOMETHING...

TINKERING is the NEW MIDDLE CLASS...
 ...and it's EMPOWERING...

...it's the MARTHA STEWART for GEEKS!

ORIGINALLY DERIVES FROM HACKING...
 WE ARE HACKING our PHYSICAL WORLD?

PEOPLE ARE BUYING 3-D PRINTERS TO EXPLORE, EXPERIMENT, AND TO BE A PART OF SOMETHING.

OBSERVING INNOVATION IN THE WILD.



BROAD SPECTRUM
 OPENS UP AND REINVENTS POPULAR MECHANICS.

TECHSHOP
 A TRANSFORMATIVE SHOP, BRINGING DREAMS INTO REALITY.

AND A COACH CAN HELP YOU...
 ...AND SO CAN THE COMMUNITY
 BUILD YOUR DREAMS HERE!

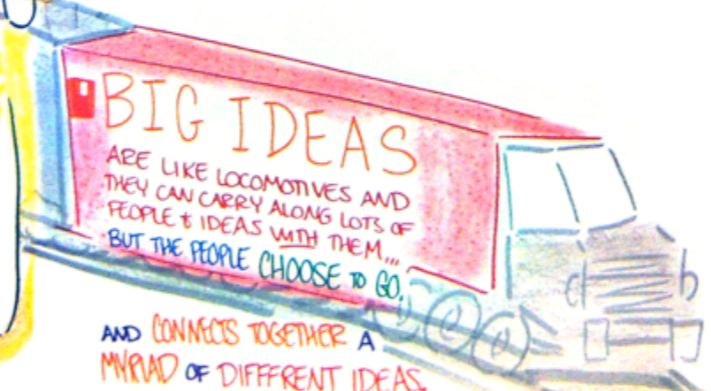
COMMUNITIES BUILDING DREAMS TOGETHER.

Kinkos FOR GEEKS

THE LARGEST UNAPPED RESOURCE is the FREE TIME of the MIDDLE CLASS.
 GIVE THEM ACCESS TO THE TOOLS AND WATCH WHAT HAPPENS!

INNOVATION NOW BECOMES FREE.
 MAKERS AGGREGATE IN THE SPACE AND INNOVATION IS REACHED IN SHORTER MORE QUICKLY EFFICIENT

- MAKER FAIR IS ALL ABOUT THE PEOPLE.
- LOTS OF PEOPLE DOING THINGS INDEPENDENTLY, CONNECTED, BUT NOT CONSTRAINED.
- IS MAKER FAIR THE TYPE OF SCIENCE FAIR WE SHOULD BE HAVING?



BIG IDEAS
 ARE LIKE LOCOMOTIVES AND THEY CAN CARRY ALONG LOTS OF PEOPLE & IDEAS WITH THEM... BUT THE PEOPLE CHOOSE TO GO.
 AND CONNECTS TOGETHER A MYRIAD OF DIFFERENT IDEAS.



DRAGONS DEN PITCHES:

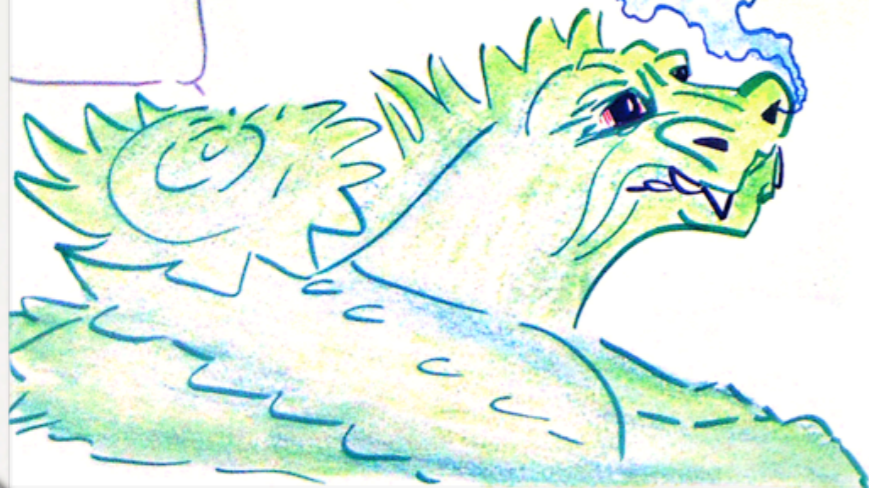
OUR INPUT TO THE BUSINESS CASE OF THE MAKER MOVEMENT

GLOBAL INSTITUTE OF SCIENCE AND TECHNOLOGY

- THINGS COMING TO THE SCREEN BECOMES THE DATA ... 3D.
- COLLABORATION NODES WORKGROUPS.

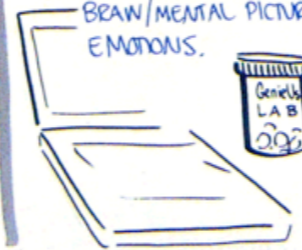
10X ACCELERATION

- SOFTWARE THAT CREATES SMART TEMPLATES TO SPEED UP THE DESIGN PROCESS.
- THE DESIGN TEMPLATES HAVE THE SMARTS FOR 'CUSTOM FIT' FOR APPAREL, FOR EXAMPLE.
- IDEA FOR MUSEUM APPLICATION TO SCAN > PRINT > SELL IN STORES... MAKING DUPLICATES FOR OVERCOMING LEGAL ISSUES.



GenieUs COGNITIVE DESIGN

- CURRENT BARRIERS TO ADOPTION: MENTAL EFFORT TO DESIGN.
- SEAMLESSLY INTEGRATES TO TAKE 'IMAGINED IDEA' TO REALITY.
- TAKE A PILL THAT CAN TAP INTO THE BRAIN/MENTAL PICTURE AND EMOTIONS.



FAST TRACK

- CONVERTING YOUR CHILDHOOD IDEAS TO REALITY.
- BETTER IDEA TO MARKET AND LESS COSTS INCURRED DUE TO 'ERROR'.
- IMAGINE IT -> PRODUCE MORE COMPLEX.
- MASS COLLABORATION ON IDEAS.
- ALIGN WITH CLOUD COMPUTING.
- EFFICIENT: DREAM ABOUT IT A NIGHT, WAKE UP IN THE MORNING WITH YOUR IDEA READY FOR PRODUCTION.

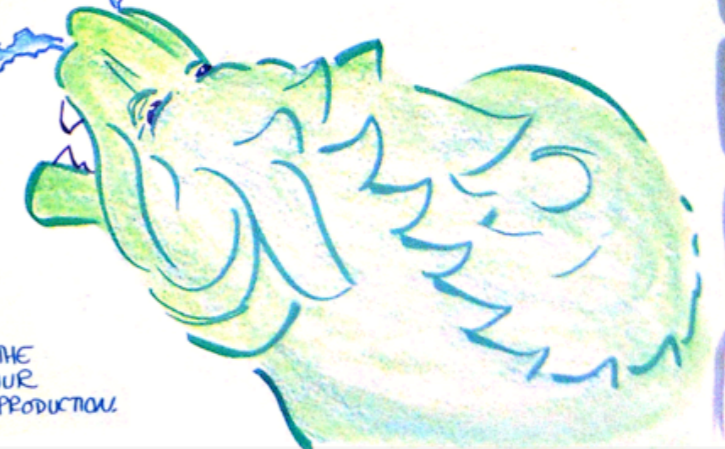
EASY VERSION CONTROL FOR THE WEB

- OBJECT TO TRACK ALL ITEMS NEEDED TO MAKE THAT OBJECT -> SHARE ONLINE THROUGH CLOUD COMPUTING -> ABILITY TO MERGE & SHARE WITH OTHERS.
- LARGER API AROUND THE IDEA... PaaS HOSTING, PLUG-INS FOR AUTHORSHIP.

OPEN UP DIGITAL FABRICATION TO LARGE CORPORATIONS, i.e. check out FOODS CURATOR.

FOOD FAB

- 3-D PRINTED FOOD.
- COMES IN ANY SHAPE / FORM.
- SELLS FOOD FABRICATORS AS A KITCHEN APPLIANCE.
- ANYONE CAN BE A CHEF!
- SOCIAL NETWORK ENABLED: SHARE RECIPES AND SUGGESTIONS.
- FOOD IS SECOND LARGEST BUSINESS IN WORLD.
- FOOD CONSISTENCY CONTROL.



Welcome to VISUAL

PC VERSUS MAC!

- Mac is a Fashion Statement!
- Mac-Mess!
- You can't get video out of a Mac.
- Wires, Wires, Plugs, Plugs!
- We're a Design Company... Mac won't do!
- Where's the frickin' Docking Station!
- USBs cover the other USB ports!



- PC COMMERCIALS ARE FUNNY!
- Macs are small, portable, beautiful!
- PC is fast, baby!
- Bill Gates doesn't think the Maker-Movement is interesting!
- Hey Bran, what kind of computer do you use?!

- ### GOOD IDEA!
- Everything is made automatically... and so should buildings.
 - Can be reinforced... built by layer... same as traditionally.
 - It's earthquake safe!
 - Print the glue!
 - Less expensive - automated.



- ### NO WAY!
- Plastic buildings... not quality.
 - Earthquake issues!
 - How will you attach layers?
 - Design is a matter of personal taste!
 - Let the work speak for itself!

- ### DESIGN SHOULD BE DEMOCRATIZED
- Everyone should have the opportunity to design!
 - You elitist!!!
 - You don't have to buy it!
 - Designers can/will design shit!
 - You don't play violin with a sausage! ...huh?
 - Don't fiddle with a sausage!

BUILD A BUILDING IN A DAY...

MASS ADOPTION OF 3D PRINTING

- ### YES!
- Not cheap, but affordable!
 - My idea becomes reality!
 - Only limited by imagination!
 - Efficient + quick!
 - Technology will catch up for quick printing.
 - No more going to the store!

- ### NO!
- Takes too long to print!
 - It won't be adopted quickly to scale... enough to be efficient!
 - Too expensive!
 - What about toxicity in people's homes? Fabrication in H-O-M-E-S!



WE WANT THE TRUTH ABOUT THE WORLD OF DESIGN

- ### GREAT IDEA
- Huge industry!
 - We all have to E-A-T!
 - It will change the world!
 - You can get organic.
 - Everyone is a chef!
 - It's the future!
 - Helps with portion control/health!

FOOD FAB! it's a DRAW...

- ### BAD IDEA
- Remember TANG?!
 - Food needs to be real!
 - Want good organic food!
 - Science fiction!
 - What about the joy of cooking... it's art!
 - No fun!
 - It'll be expensive! New hardware!
 - Frankenfood!
 - Elitist crap!



REFLECTIONS FROM DAY 1

SOME OF OUR WANTS...

• A BETTER TERM FOR THE MAKER MOVEMENT.

• THOUGHTS AND IDEAS REGARDING HOW WE CAN PROMOTE THE BUSINESS.

• POSSIBILITY TO CREATE CROWD-SOURCING PROBLEM-SOLVING FORUMS AND COMMUNITIES...

• HOW CAN WE INFLUENCE POLICY?

• IN ADDITION TO STEM, HOW CAN WE EDUCATE / INFLUENCE THE NEXT GENERATION OF ENGINEERS?

• HOW DO WE DEFINE OURSELVES WITH IN THE MAKER MOVEMENT?
...attracting capital to the space...

• WHAT WILL THE INNOVATION ECOSYSTEM LOOK LIKE?

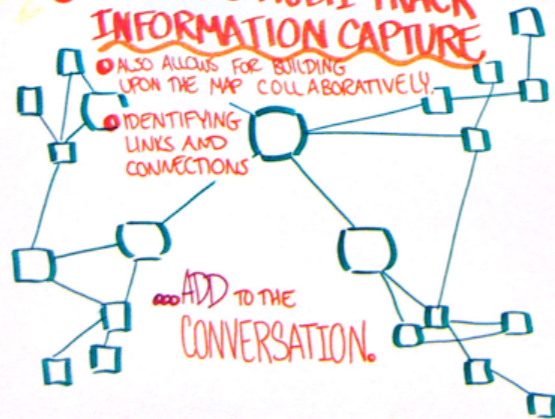
CONTINUE THE CONVERSATION

DYNAMIC MULTI-TRACK INFORMATION CAPTURE

• ALSO ALLOWS FOR BUILDING UPON THE MAP COLLABORATIVELY.

• IDENTIFYING LINKS AND CONNECTIONS

• ADD TO THE CONVERSATION.



EMERGING TECHNOLOGIES...

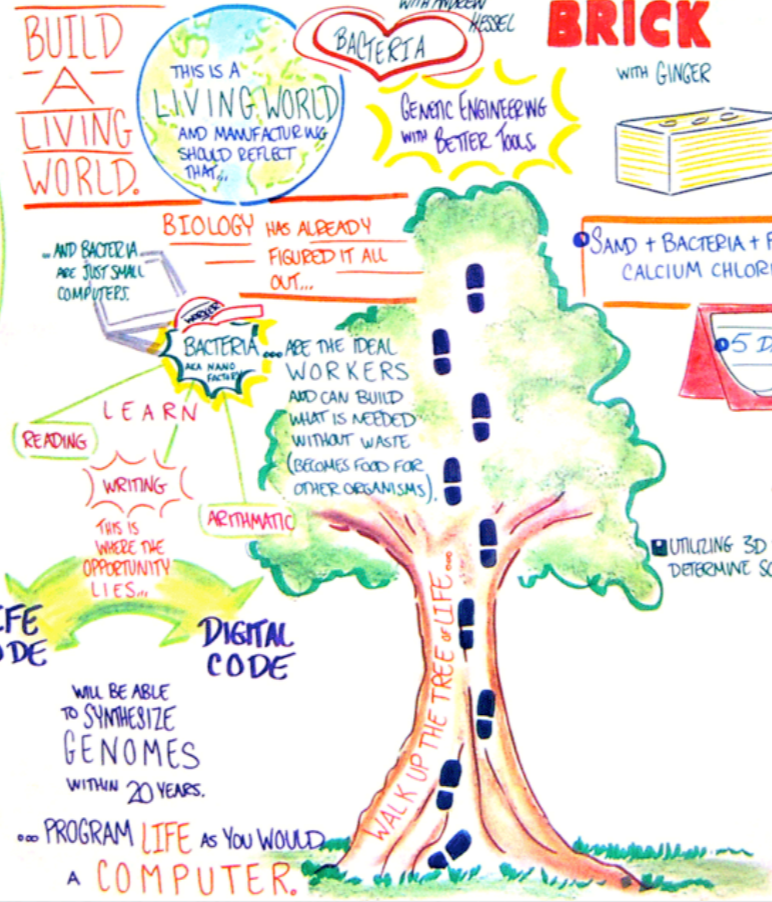
SELF-ASSEMBLING MATTER

WITH CARLOS OLGUIN
AUTODESK



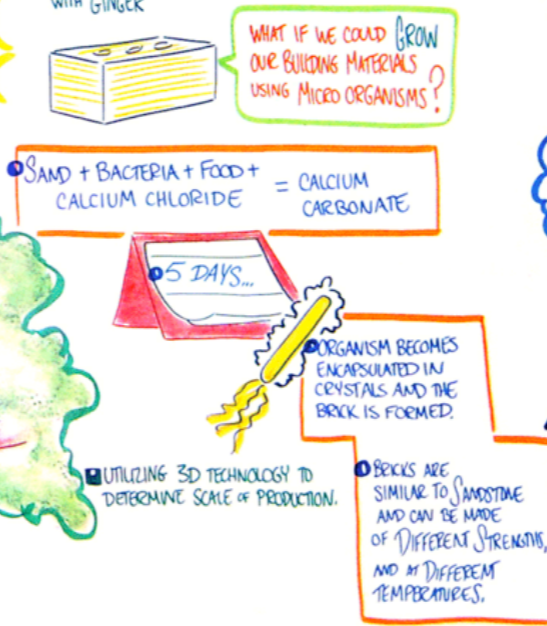
DIY BIOLOGY

WITH ANDREW KESSEL



BIOMANUFACTURED BRICK

WITH GINGER



THE BOTTOM OF THE PYRAMID

WITH FLORENCIA ESTRADA
CREIA

