

DYNAMICLAND

is a place for all people to

build

study

play

speak

learn

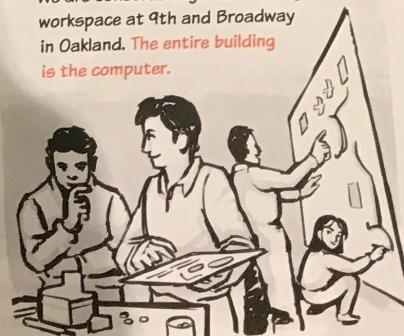
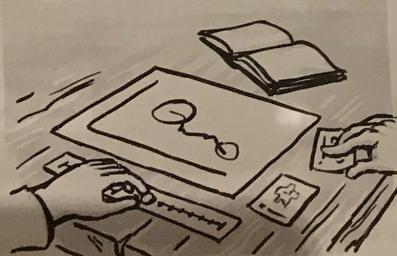
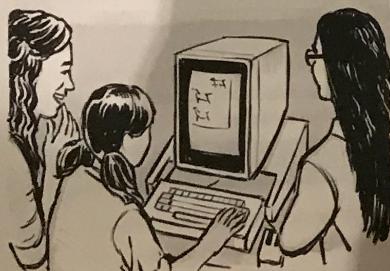
in fundamentally
new ways.

(ALSO IT'S A NEW KIND OF COMPUTER.)

We are a **non-profit, long-term research group** in the spirit of Doug Engelbart and Xerox PARC.

We are inventing a **new computational medium** where people work together with **real objects in physical space**, not alone with virtual objects on a screen.

We are constructing a community workspace at 9th and Broadway in Oakland. **The entire building is the computer.**



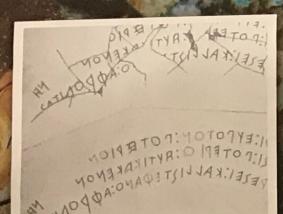
FIRST, SOME CONTEXT

Dynamaland is about

TOOLS TO THINK NEW THOUGHTS



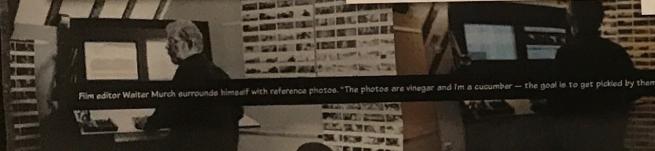
Clay tokens (8000 BC) were the precursors of both writing and mathematics. Each shape stood for a different commodity. These physical objects enabled people to *compute* by arranging, rearranging, and grouping them, to *communicate* these computations, and to *store* accounts.



The alphabet (800 BC) physicalized speech. Intangible, ephemeral sounds became physical marks that could be seen, studied, played with, and preserved. Alphabetic writing has been credited with the "Greek miracle" of philosophy, art, and literature around 400 BC.



The printing press (1450 AD) gave ideas a physical form that was portable and replicable. Print made possible mass literacy and the democratization of knowledge. The invention of journals, citations, and data graphics ushered in the scientific revolution.



Film editor Walter Murch surrounds himself with reference photos. "The photos are vinegar and I'm a cucumber — the goal is to get picked by them."



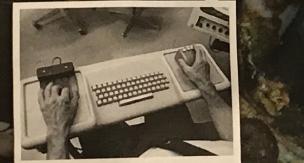
The personal computer (1970 AD) enabled dynamic media.



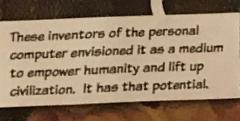
Alan Kay saw it as a medium for reading and writing with systems and simulations, as opposed to stories and arguments, giving humans a new lens to understand the world.



Seymour Papert saw it as a generator of microworlds, where one could learn math in "Mathland" like learning French in France.



Doug Engelbart saw it as a tool to augment the intellect of knowledge workers, and enable humanity to solve the world's complex problems.



But as long as the computer is a closed box, it only truly empowers the select few keys to the box. Like scribes before the printing press.

And as long as computation resides in intangible virtual worlds, it leaves untapped the vast range of human capabilities for working with thoughts as things. Things that can be seen with the eyes, manipulated with the hands, and placed in physical space.

Eyes and brains are only found in animals that move. The sea urchin swims around until it settles into a permanent home, then digests its brain. Brains evolved for movement.

Dynamaland is a computer with no box. People walk around inside it. Computer-stuff is not made of fleeting, ephemeral images on a screen, but real physical things that enable people to think with their whole selves.

And in particular, Dynamaland is about thinking

TOGETHER, NOT IN ISOLATION

Artistic and scientific revolutions are often mistakenly attributed to "lone geniuses", when in fact they emerged from unusually fertile places — Florence in the Renaissance, the Copenhagen cafés where quantum mechanics was born, Bell Labs...



According to Mervin Kelly, director of Bell Labs in its prime, physical proximity and personal contact among workers "was everything".



Feynman diagrams spread throughout the physics community almost entirely through people physically working together. Nobody learned this tool merely by reading about it.



In Doreen Nelson's "city-building education", students focus on a central shared project, not a lecturer or a laptop.



Studying navigators on a Navy ship, Edwin Hutchins coined the term "horizon of observation" for the degree to which using a tool teaches the people around it. Navigation involved shouting questions and drawing lines on charts, which revealed and taught the process to everyone.

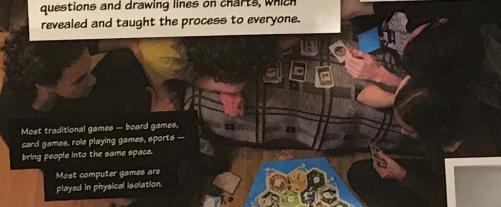


In dance and martial arts communities, group learning is spontaneous. Beginners learn by watching advanced students. People see others who are struggling, and offer help or advice.



Working in the same physical space as others, performing activities that others can observe, learn from, and help with, is a core element of being human.

TOOLS FOR CONVIVIALITY
ILLICH
FOR THE SOCIETY OF KING



Most traditional games — board games, card games, role playing games, sports — bring people into the same space.

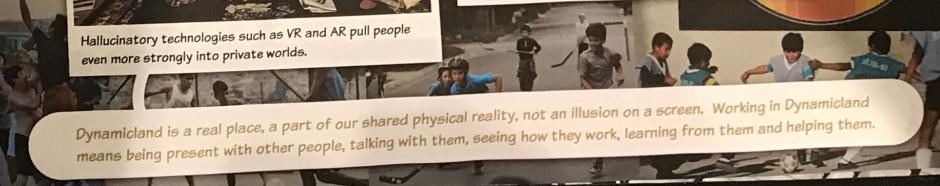
Most computer games are played in physical isolation.



Hallucinatory technologies such as VR and AR pull people even more strongly into private worlds.



Computer screens bias towards isolated personal spaces.



Dynamaland is a real place, a part of our shared physical reality, not an illusion on a screen. Working in Dynamaland means being present with other people, talking with them, seeing how they work, learning from them and helping them.

Dynamicland deeply embodies the spirit of

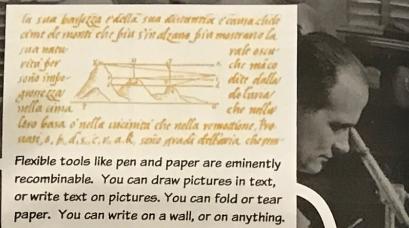
TOOLKITS, NOT APPS



Jerome Bruner suggests that we shouldn't celebrate a child's first word, but when a child first **combines two words** to form a new meaning.



Animals can learn individual words, but cannot combine words to express new ideas. The power of language lies in recombination.



Flexible tools like pen and paper are eminently recombinable. You can draw pictures in text, or write text on pictures. You can fold or tear paper. You can write on a wall, or on anything.



An abacus infuses knowledge of arithmetic into its user, such that when the abacus is taken away, the capability remains.

A calculator provides an answer, but no insight.

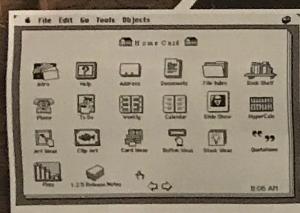
The original vision of personal computing was people writing their own software for their own unique situations.



A woodworker builds a custom jig from scrap wood for making precise, repeatable cuts. **Materials are tools.**



A metalworker welds a bar to an adjustable wrench for performing two-handed twists. **Tools are materials.**



In Smalltalk, Genera, and HyperCard, every interactive element is an "object" that can be combined with other objects. Every mechanism can be inspected and modified. **Every program is a toolkit for building other programs.**

Even the original World Wide Web program was both browser and editor.



Today, apps are black boxes that cannot be combined, inspected, or modified. When you have a need, you go to the app store.



With cloud-based oracles, the mechanism is completely hidden. When it works, you don't know why. When it doesn't work, you're stuck.

Dynamicland is not an app store, with one-size-fits-all products to use. Dynamicland is an authoring environment. It provides the tools for people to make their own tools, remix the tools of others, and develop fluency in a medium.

We are a non-profit long-term research group, chartered with inventing the future of the computer as a humane, inclusive tool for understanding the world and thinking new thoughts.

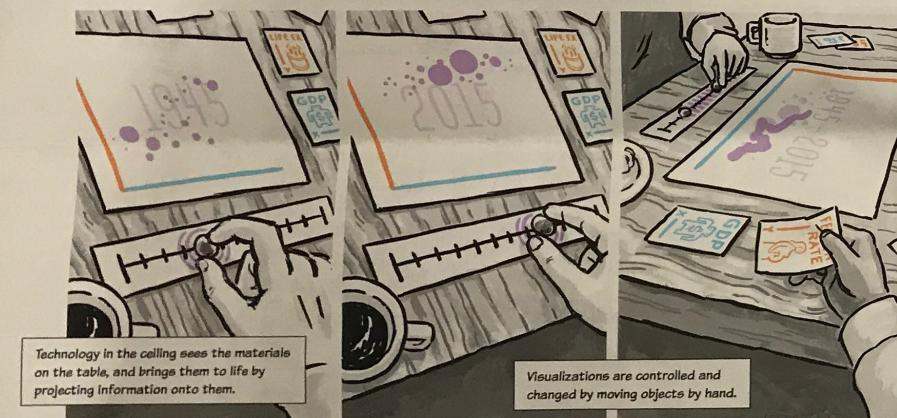
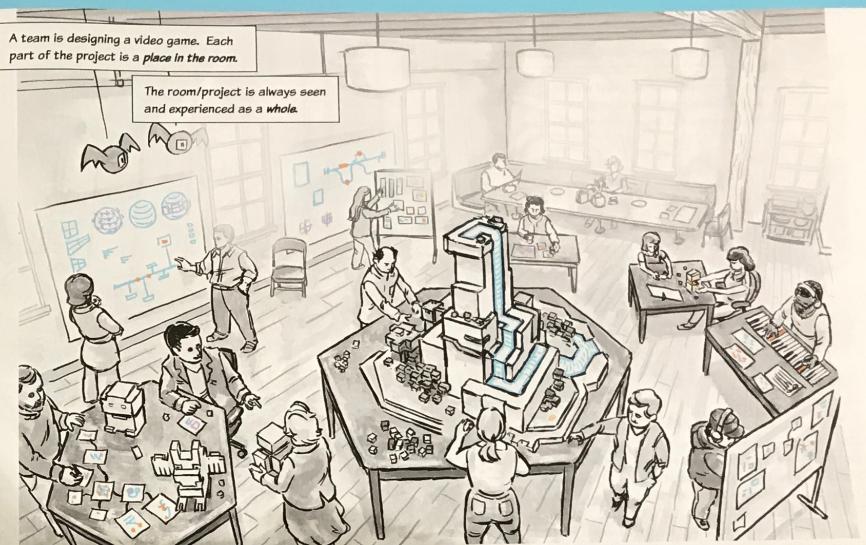
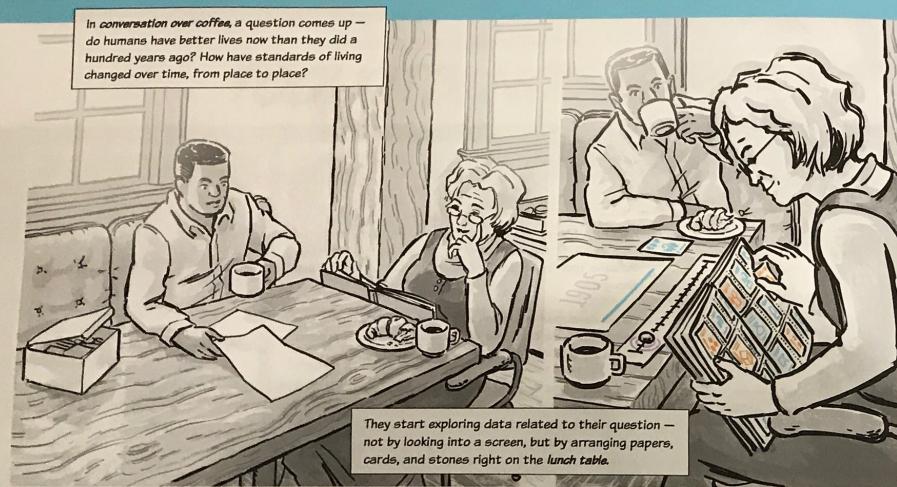
As we developed our vision and created the technology, we came to realize that this new computer wasn't a product. **It was a place.**

The technology we're building doesn't fit into a box or a pocket. It isn't a gadget that people buy and strap to their wrist or their head. It's more like a library or a workshop or a kitchen — a real place where real people come together to work with their hands on real physical things.

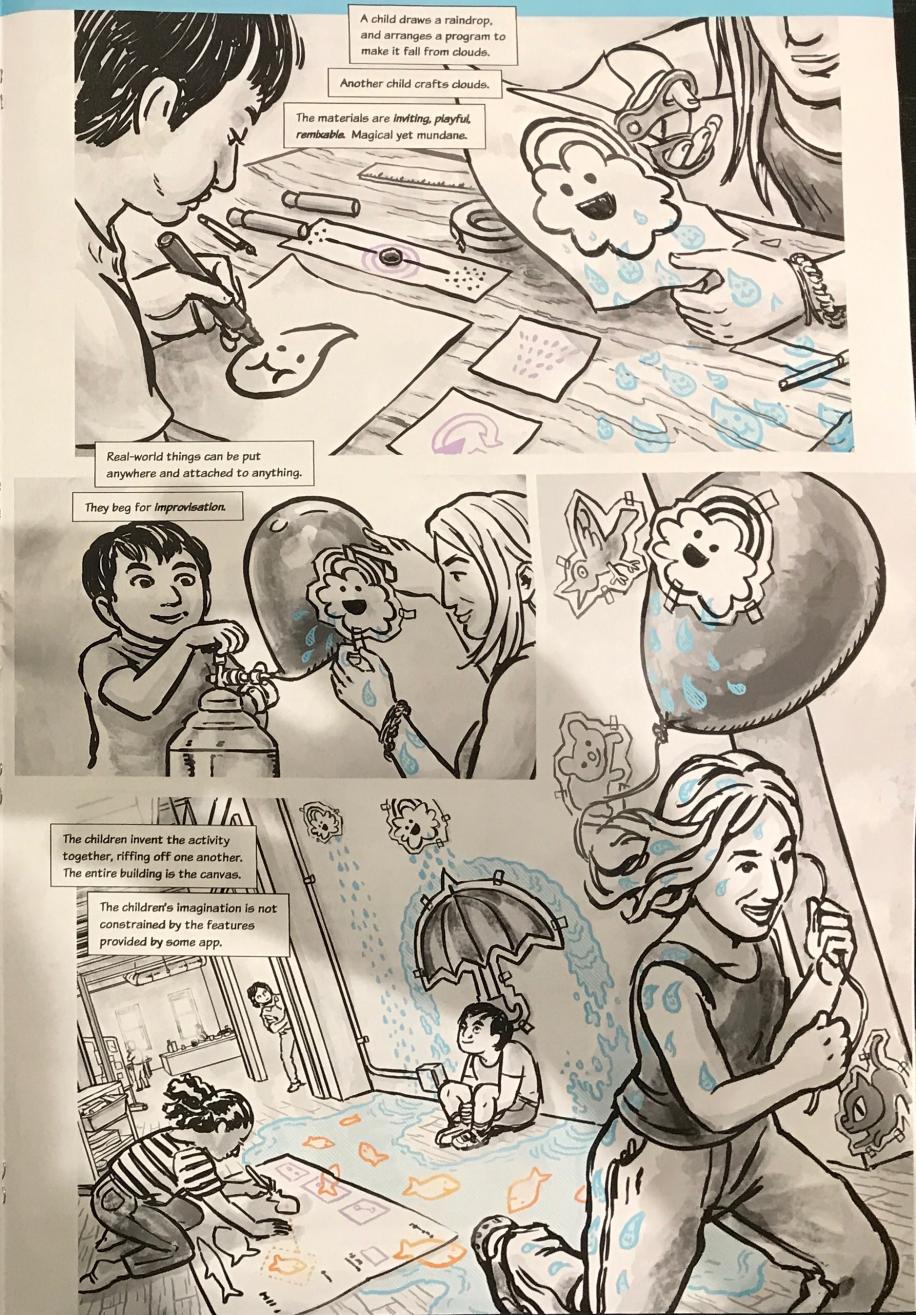
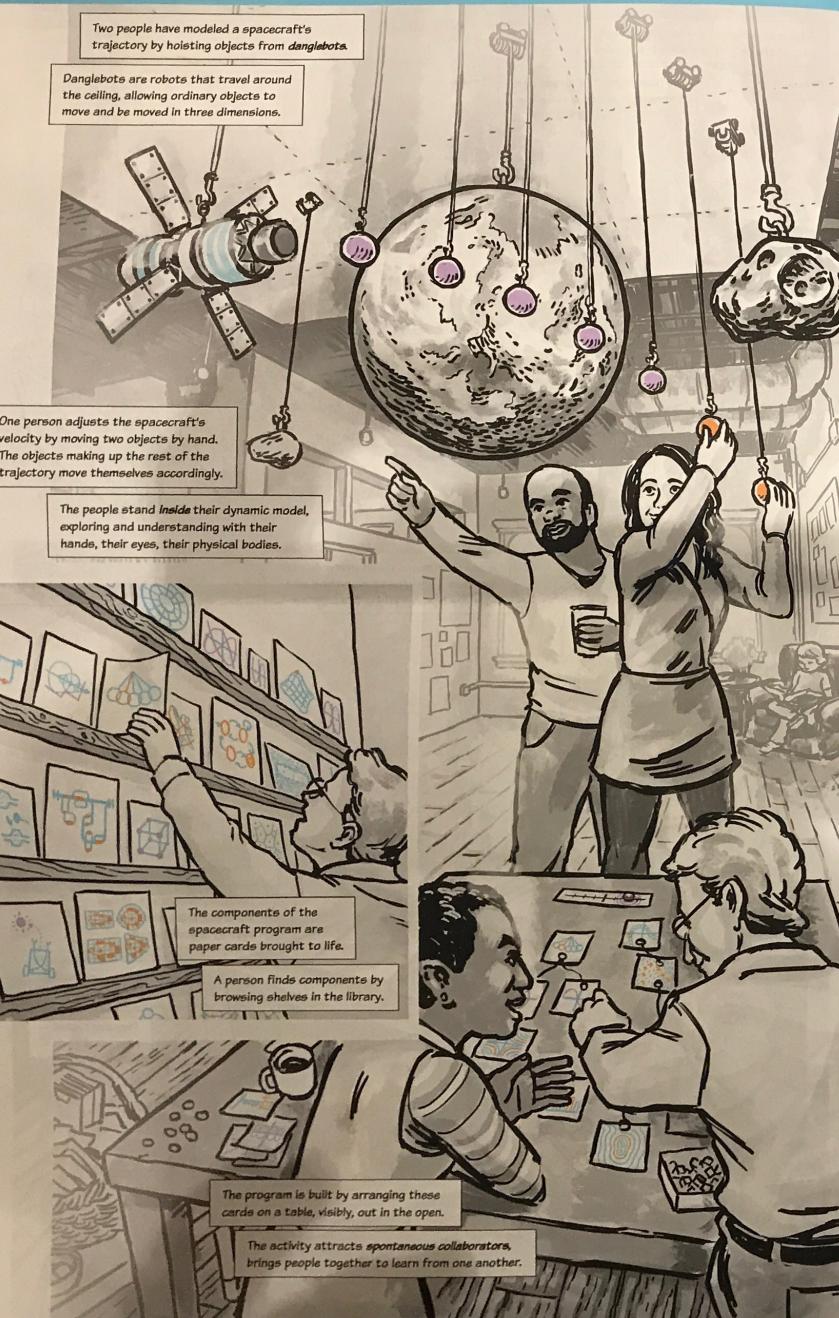
After years of research and prototyping, Dynamicland is to be our first full-scale realization of this dream. The scenarios on the following pages may look fantastical, but we've got a good start on them, and we believe they are completely achievable in a few years.



DYNAMICLAND IN 2020



DYNAMICLAND IN 2020



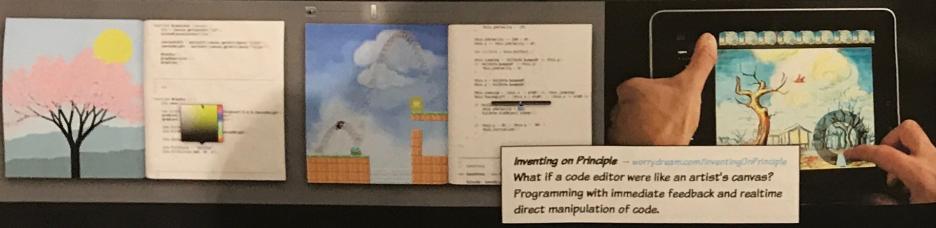
THE ROAD TO DYNAMICLAND: EARLY WORK

Dynamicland is the culmination of years of experimentation, prototyping, and invention.

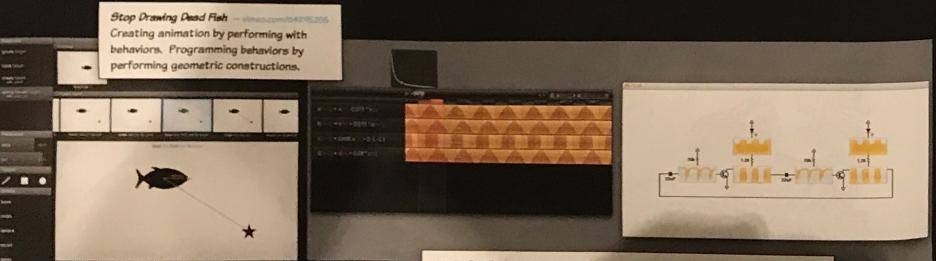


For many years, we've sought to empower people to see further and understand more deeply, by designing directly-visible and directly-manipulable computing environments.

Our group has an extensive history of pursuing these ideals in virtual space.



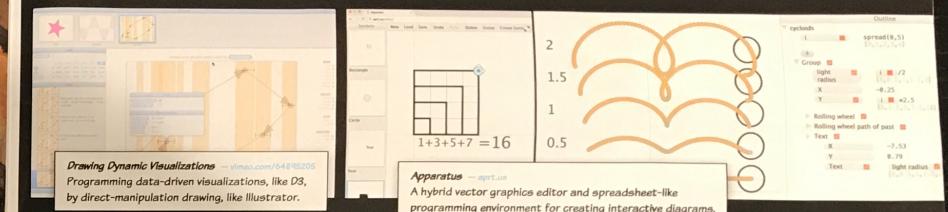
Inventing on Principle — www.ydream.com/inventingOnPrinciple
What if a code editor were like an artist's canvas? Programming with immediate feedback and realtime direct manipulation of code.



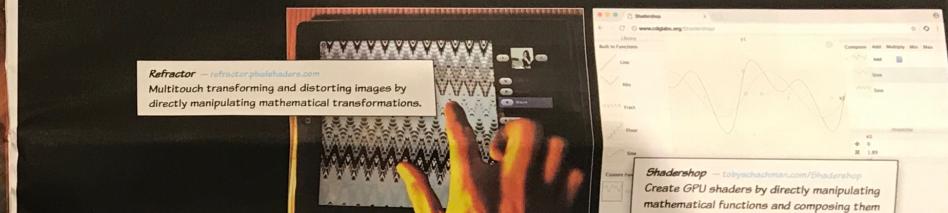
Media for Thinking the Unthinkable — www.ydream.com/MediaForThinkingTheUnthinkable
Redesigning how we read and write systems in the interactive medium.



Learnable Programming — www.ydream.com/learnableprogramming
Programming environments designed for people to see and understand what a program is doing. Tufte-approved!



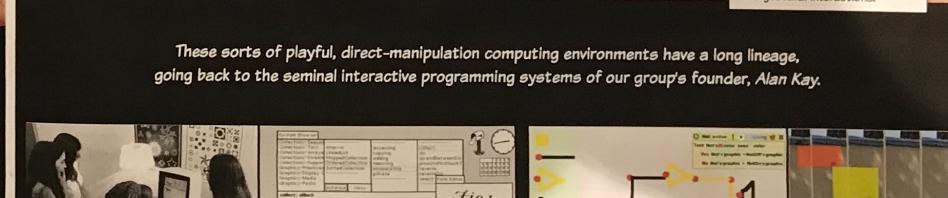
Apparatus — appr.us
A hybrid vector graphics editor and spreadsheet-like programming environment for creating interactive diagrams.



Refactor — refactor.phalaclabs.com
Multitouch transforming and distorting images by directly manipulating mathematical transformations.

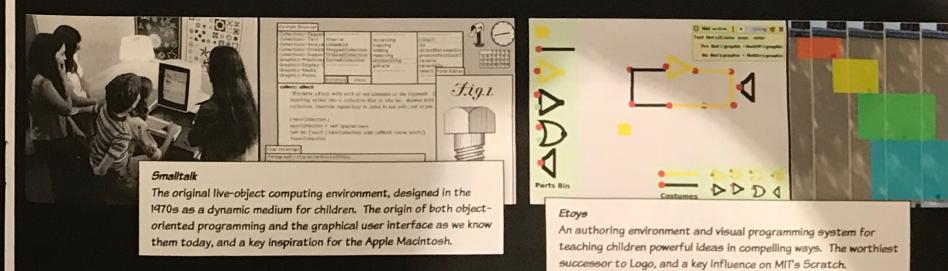


Rumpus — rumpus.land
A live-coding playground for room-scale VR. Every object's source code is visible and editable in real-time, right down to the source code for Rumpus itself.



TACAO — paulayi.github.io/tacao/
3D modeling using tangible pieces and gestural interactions.

These sorts of playful, direct-manipulation computing environments have a long lineage, going back to the seminal interactive programming systems of our group's founder, Alan Kay.



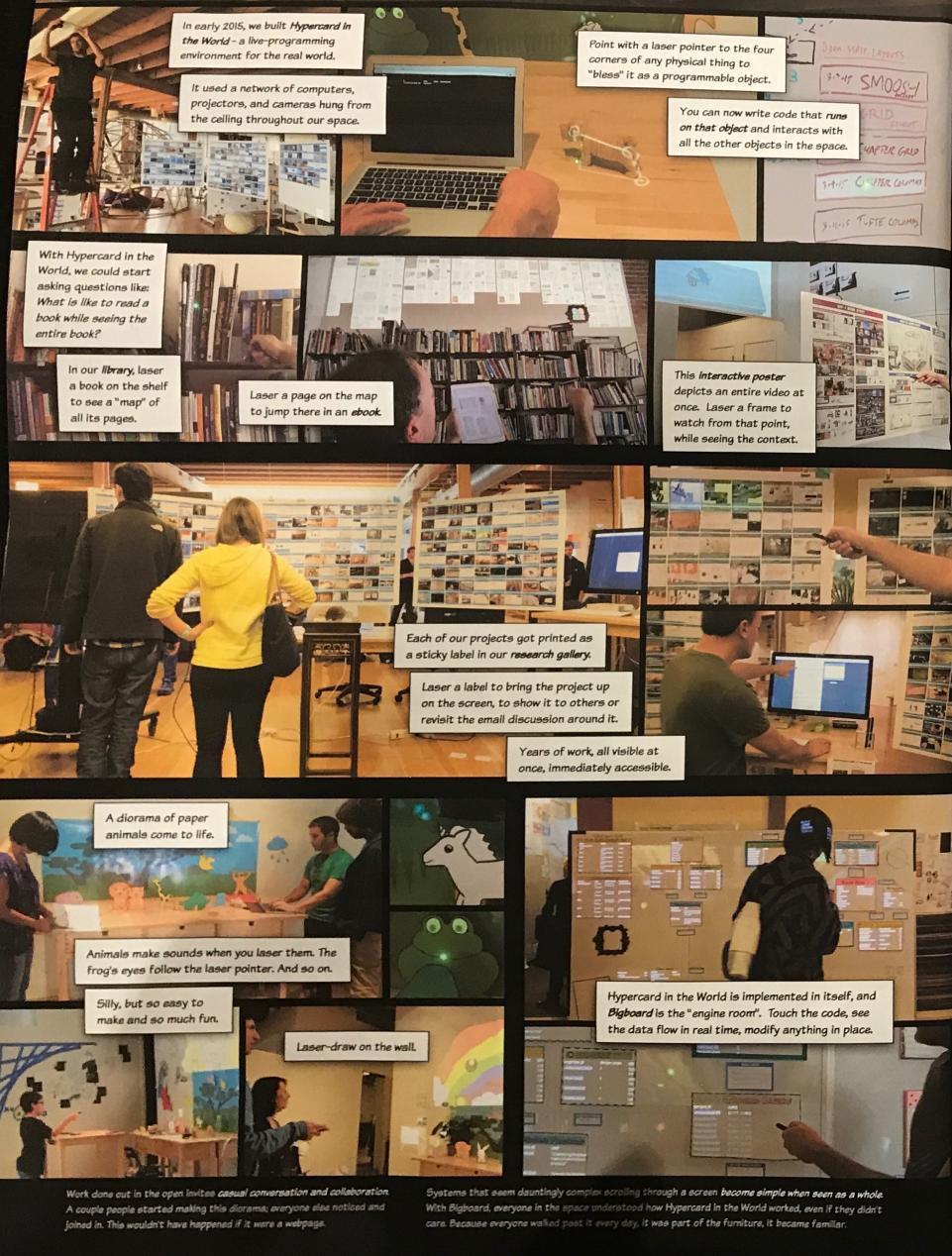
Smalltalk
The original live-object computing environment, designed in the 1970s as a dynamic medium for children. The origin of both object-oriented programming and the graphical user interface as we know them today, and a key inspiration for the Apple Macintosh.

Etoys
An authoring environment and visual programming system for teaching children powerful ideas in compelling ways. The worthiest successor to Logo, and a key influence on MIT's Scratch.

THE ROAD TO DYNAMICLAND: PROTOTYPES

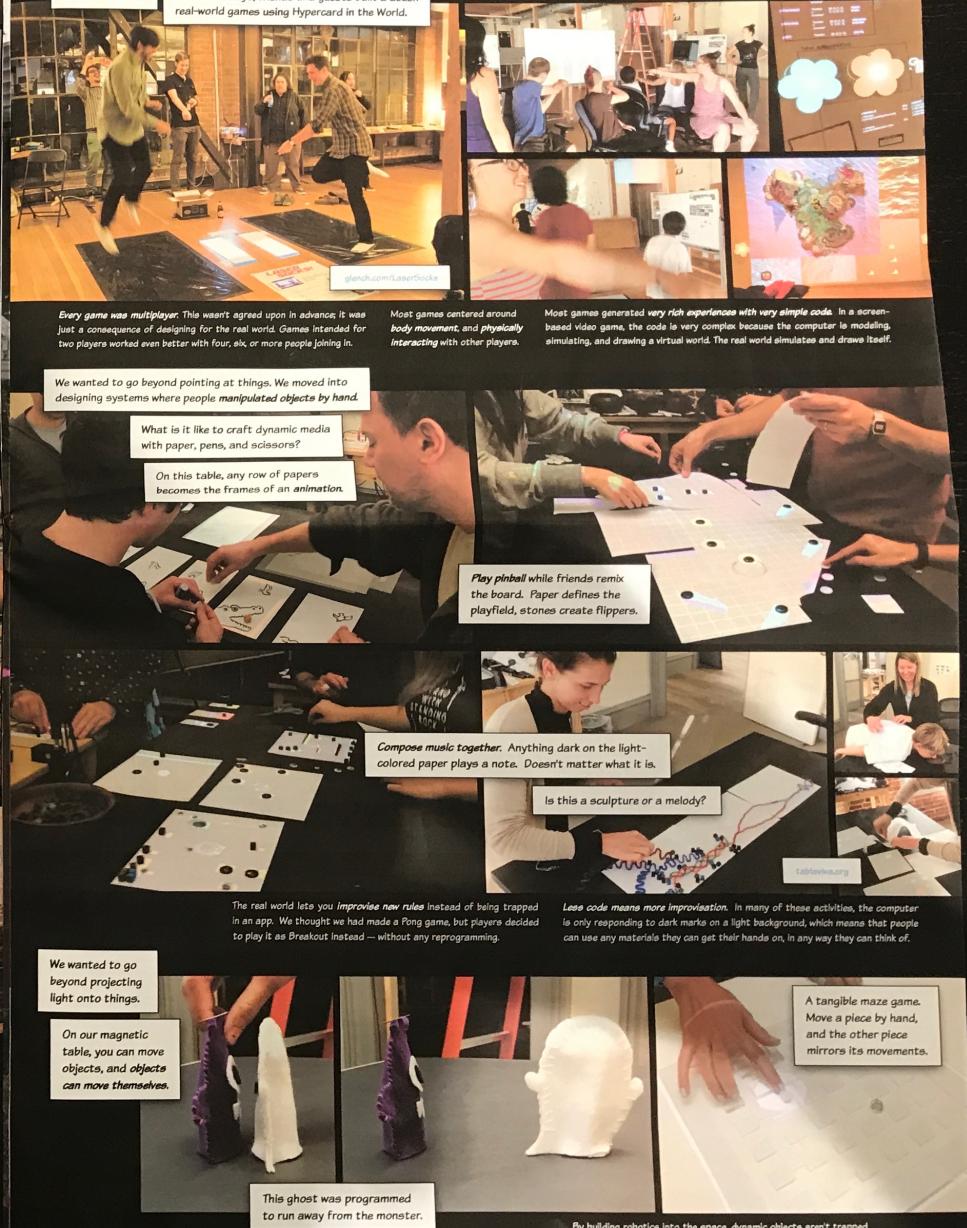
Despite the potential of our designs, we came to feel oppressed by the intangibility, isolation, and claustrophobia of our screen-based creations. We were building worlds that we didn't want to live in.

Was there a humane vision of interactive computing? One in which people could truly work together, using their eyes and hands, their bodies, the space around them?



GAME JAM!

Over three days, friends and guests built a dozen real-world games using Hypercard in the World.



WHERE WE'RE AT, WHERE WE'RE GOING

Realtalk

After learning from all of these prototypes, we were ready to begin Realtalk.

Realtalk is visible. The entire system is literally on the table. It's designed to be examined, understood, and modified, with no barriers or black boxes. The chart explaining the system is itself the running system. There can't be anything hidden, because if a person can't see something, Realtalk can't see it either!

Realtalk is general. Any physical thing can be an "object", as long as some other object claims to recognize it. Anything can be a "program" (whether it's a page of text, a diagram, or a pile of stuff on a table) as long as some object claims to have interpreted it. Realtalk is not limited to cameras and projectors, but accommodates any sensors or actuators — they're all just objects making and noticing claims about the world.

In Realtalk, the real world is ground truth. Instead of simulating and imposing a virtual world, Realtalk simply enables real objects to notice and respond to what's happening with other real objects, in real time. Like a physical tool, Realtalk doesn't drive the action, or even have any idea what exactly people are doing with it. People manipulate objects, other objects notice and respond, and "user interfaces" are usually unnecessary.

Realtalk is fun, even at such an early stage. Words can't describe what it's like to build a software system by crafting a living mural with your hands, with your friends, with code you can see and hold and pass around. Or what it's like to pull a card out of your pocket and see rainbow hues dance around the room. Every day we discover new ways of improvising with this strange and wonderful mix of computational and physical material.

A community space

A demo is not enough. We want real people using Realtalk, both for their own benefit and for us to learn from them and continue the research. But Realtalk isn't an app that can be passed around on the web. It's built into a building. So we'll bring people to it.

The building is at 9th and Broadway in Oakland, in a lively, diverse neighborhood, two blocks from the BART station. Our goal is for this space to eventually become a public institution serving the community, like a library, museum, or makerspace.

Later this year, we'd like to start by hosting a few artists-in-residence and scientists-in-residence, as well as teaching workshops and a university class in/on/about Realtalk.

By the end of 2018, we hope to have a set of community members working out of the space full-time, using Realtalk for their own work. Dynamoland will also be hosting public events, art installations, lectures, and classes — not about Realtalk itself, but using Realtalk as a next-generation creative tool and communication medium.

As Dynamoland makes the transition to an open community workshop with public hours, we'll continue research on the next version of Realtalk.

We are thinking of the Oakland Dynamoland itself as the prototype for a new kind of civic institution, which will someday bring a new form of literacy to the people of every city, as did the public library. Perhaps existing libraries will become dynamelandes.

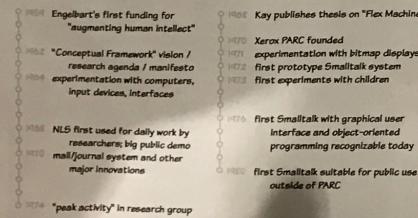
Timelines

To the right are timelines of the two most influential research systems in personal computing, NLS and Smalltalk.

In research, it can take several years from vision to the first prototype that hints at the concepts, several more years to a working system in which the ideas have flowered, and several more years of exploring the possibility space now available.

Much of the time is experimentation, prototyping, blind alleys, and the general confusion of inventing a way of thinking that is apart from current practices and trends. For deep, non-incremental work, this is simply part of the process. It's a different pace than industry work. But it's these research projects which give rise to entire industries in the first place.

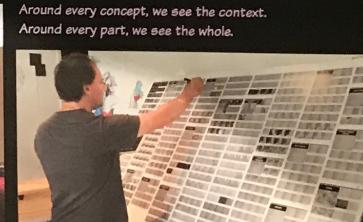
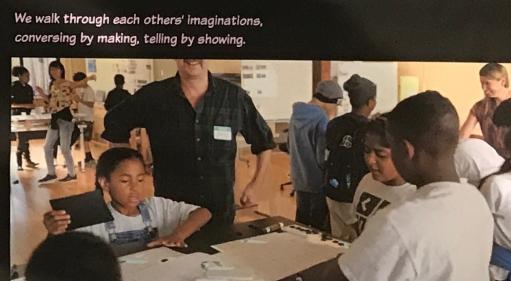
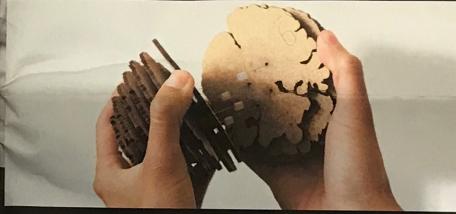
We aspire to do such work, with such consequences. By this measure, we're right on schedule.



In a possible future,
just within reach,
computing is continuous with human life.



We shape ideas in our hands.
The world becomes a thing to think with.



We see the invisible, think the unthinkable, share the inexpressible.

Together.

THE DYNAMIC MEDIUM GROUP



THANKS TO OUR FRIENDS, COLLEAGUES, & PATRONS

Alan Kay
Chaim Gingold
Dave Cerf
David Hellman
Glen Chiacchieri
Götz Bachmann
Jennifer Jacobs
Matthias Graf
May-Li Kho
Michael Nagle
Rob Ochshorn
Sam Altman
Vishal Sikka
The HARC community

Our group is organized under a 501(c)(3) tax-exempt nonprofit.
We're actively seeking **founding donors** to make Dynamicland a reality.
Get in touch at donate@dynamicland.org.

DREAM MACHINES

All About LOGO -
How It Was Invented and How It Works
INDSTORMS

Children, Computer
and Power

A Pattern Language
Towns Buildings Construction
Christopher Alexander
Sara Ishikawa
Max Jacobson
Silvana Silverstein



no Wizards

July 2017