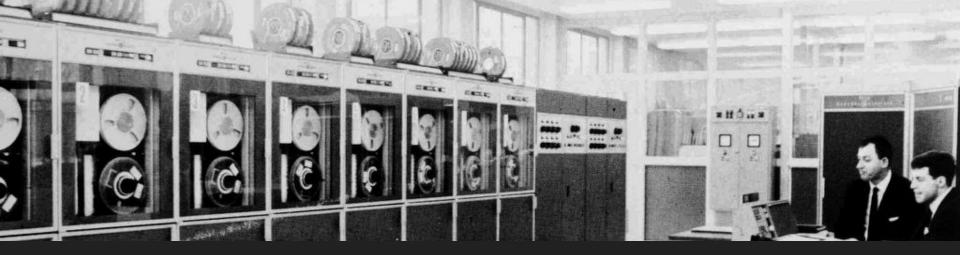# The Mother of All APIs

From Engelbart to the Present

Mike Amundsen
@mamund

Zdenek Nemec
@zdne

Introductions

Zdenek "Z" Nemec

- Pioneered the API-design and API-first at Apiary
- Author of API Blueprint
- Co-author of MSON
- Founder of Good API the independent API consulting company
- Helping the world largest enterprises such as DHL, Inditex, or adidas on their API journey
- Creator of supermodel.io data modeling tool
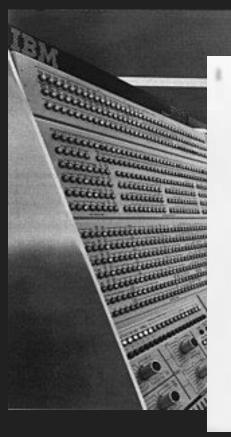
Mike Amundsen

- Author
- Speaker
- Trainer
- Advisor

"Working to improve the quality and usability of information on the Web with APIs, Microservices, and Digital Transformation."
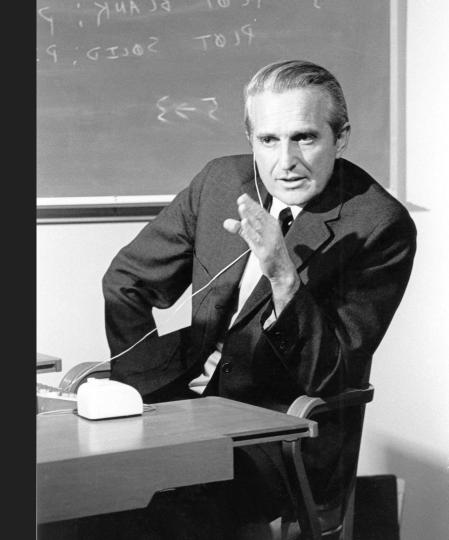
December 9th, 1968
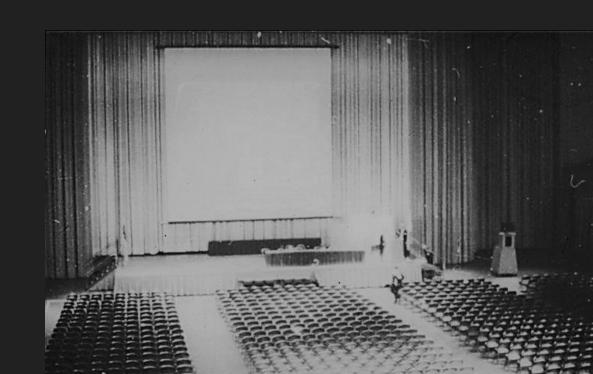
1   MARKET
    2A   PRODUCE
        2A1   ORANGES
        2A2   APPLES
        2A3   BANANAS
        2A4   CARROTS
        2A5   LETTUCE
        2A6   BEANS
    2B   CANS
        2B1   APPLE SAUCE
        2B2   BEAN SOUP
        2B3   TOMATO SOUP
    2C   CEREALS
        2C1   BREAD
        2C2   NOODLES (ELBOW FIN
        2C3   FRENCH BREAD
    2D   COLD LOCKER
        2D1   MILK
        2D2   BUTTER

Demo Day 1968

APPLES
BANANAS
CARROTS
LETTUCE
BEANS
CANS
  APPLE SAUCE
  BEAN SOUP
  TOMATO SOUP
CEREALS
  BREAD
  NOODLES (ELBOW KIND)
  FRENCH BREAD
COLD LOCKER
  MILK

APPLES

BANANAS

CARROTS

LETTUCE

BEANS

CANS

   APPLE SAUCE

   BEAN SOUP

   TOMATO SOUP

CEREALS

   BREAD

   NOODLES

   FRENCH BREAD

COLD LOCKER

   MILK
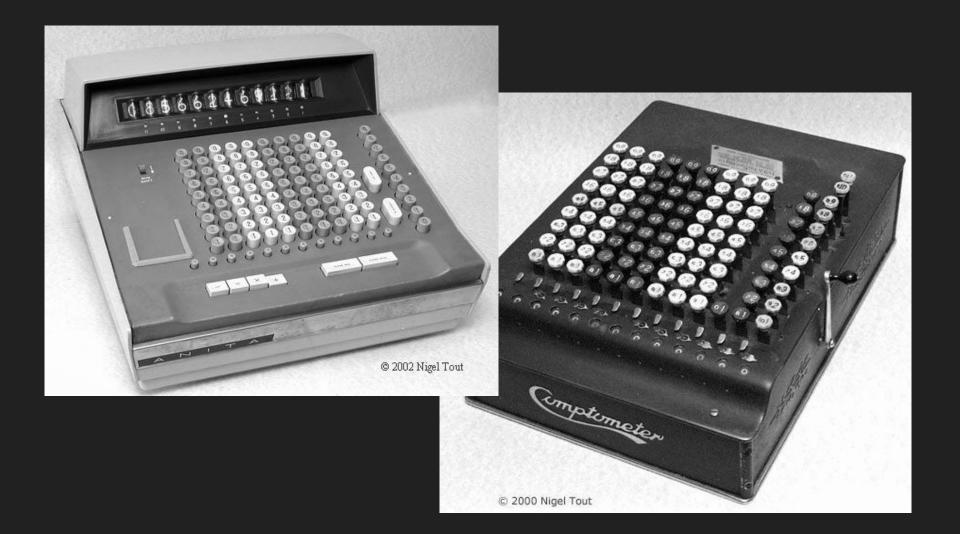
- **Realtime multi-cursor, in-place editing**
- **Point-and-click, drag-and-drop, cut-and-paste**
- **Hyperlinking and hypermedia**
- **Intelligent outline-based editing**
- **Text messaging**
- **Live video & text editing on the same screen**
- **Revision control**
- **and more...**

© 2002 Nigel Tout

© 2000 Nigel Tout

- **Better solutions,**
- **Faster solutions,**
- **More complex problems, with…**
- **Better use of human capabilities.**

Bootstrapping

The Promise of APIs

Demo #1

One-Handed, Chord Keyset:

Code for "a" →

b
c
d
e
f
g
h
x
y
z
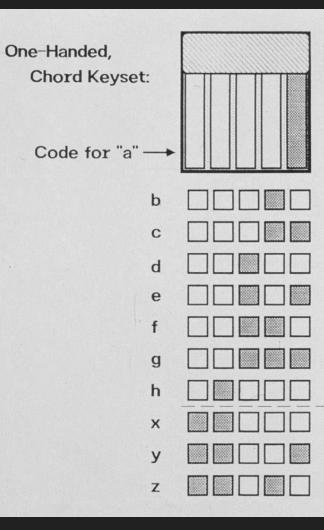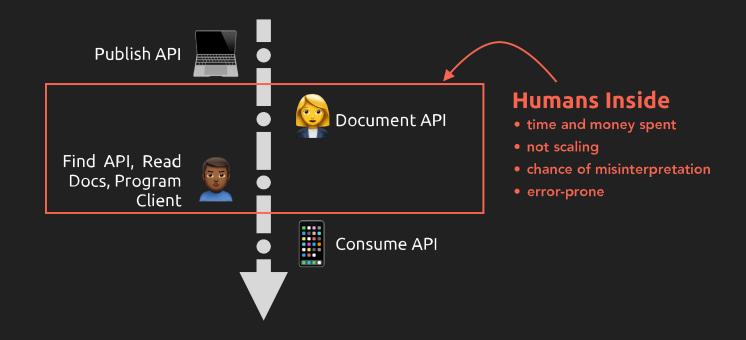
Humans Inside

mechanical turks

Publish API 💻

Document API 👩‍💼

Find API, Read Docs, Program Client 👨🏾

Consume API 📱

Humans Inside

- time and money spent
- not scaling
- chance of misinterpretation
- error-prone

Improving Effectiveness
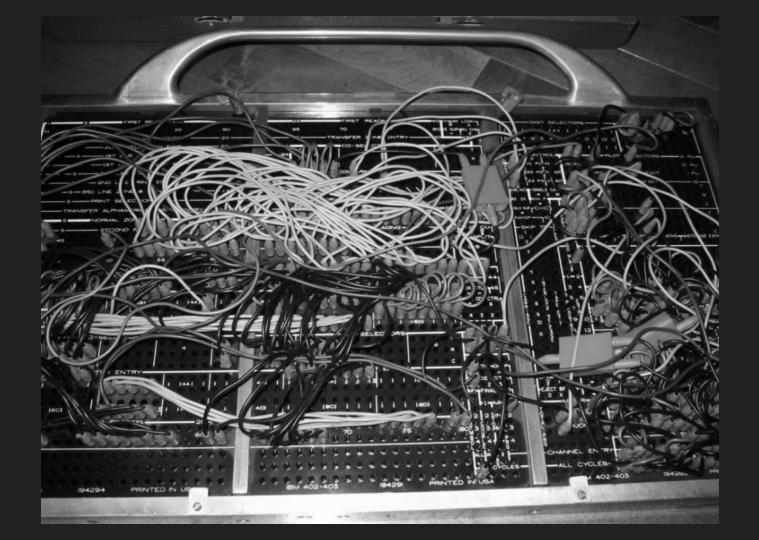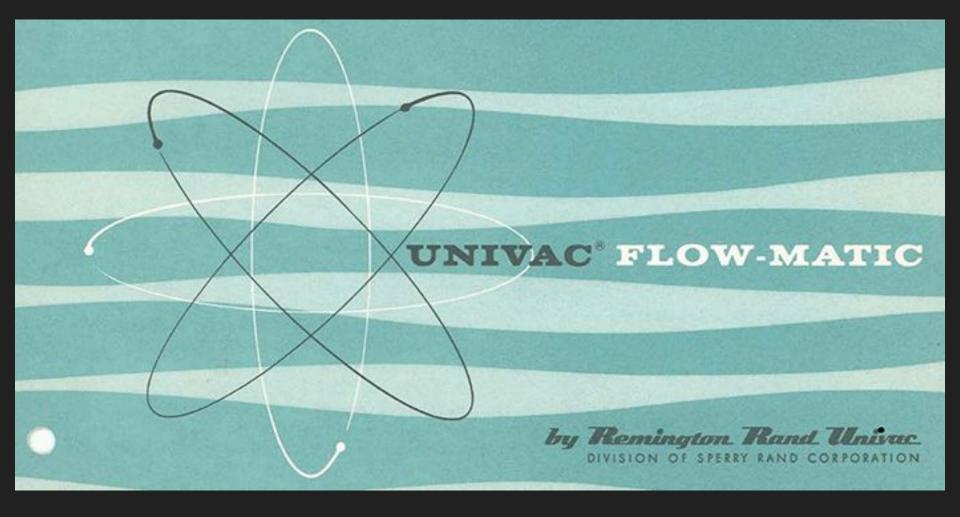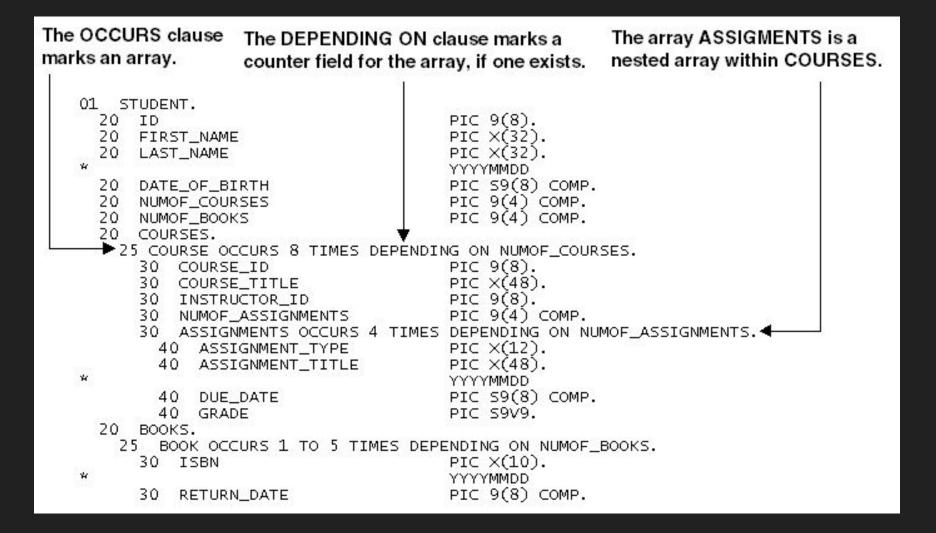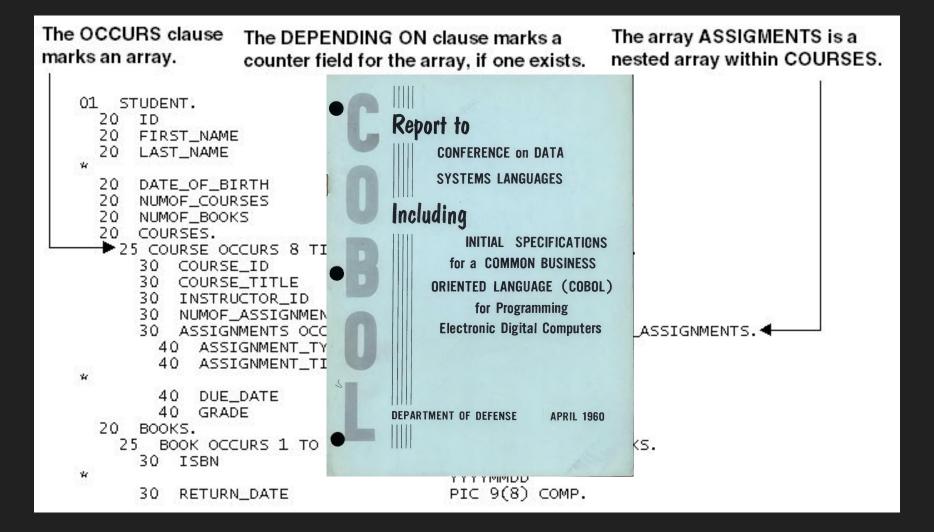
https://futureforce.navylive.dodlive.mil/2014/06/grace-hopper-and-information-age-invention/

UNIVAC® FLOW-MATIC

by *Remington Rand Univac*
DIVISION OF SPERRY RAND CORPORATION

```
01   STUDENT.
  20   ID                              PIC 9(8).
  20   FIRST_NAME                      PIC X(32).
  20   LAST_NAME                       PIC X(32).
*                                      YYYYMMDD
  20   DATE_OF_BIRTH                   PIC S9(8) COMP.
  20   NUMOF_COURSES                   PIC 9(4) COMP.
  20   NUMOF_BOOKS                     PIC 9(4) COMP.
  20   COURSES.
     25 COURSE OCCURS 8 TIMES DEPENDING ON NUMOF_COURSES.
        30   COURSE_ID                 PIC 9(8).
        30   COURSE_TITLE              PIC X(48).
        30   INSTRUCTOR_ID             PIC 9(8).
        30   NUMOF_ASSIGNMENTS         PIC 9(4) COMP.
        30   ASSIGNMENTS OCCURS 4 TIMES DEPENDING ON NUMOF_ASSIGNMENTS.
           40   ASSIGNMENT_TYPE        PIC X(12).
           40   ASSIGNMENT_TITLE       PIC X(48).
*                                      YYYYMMDD
           40   DUE_DATE               PIC S9(8) COMP.
           40   GRADE                  PIC S9V9.
  20   BOOKS.
     25   BOOK OCCURS 1 TO 5 TIMES DEPENDING ON NUMOF_BOOKS.
        30   ISBN                      PIC X(10).
*                                      YYYYMMDD
        30   RETURN_DATE               PIC 9(8) COMP.
```
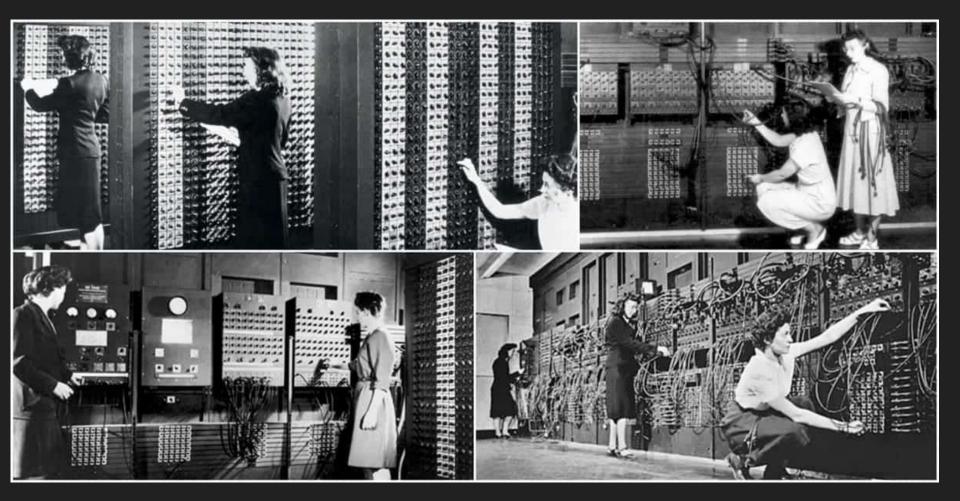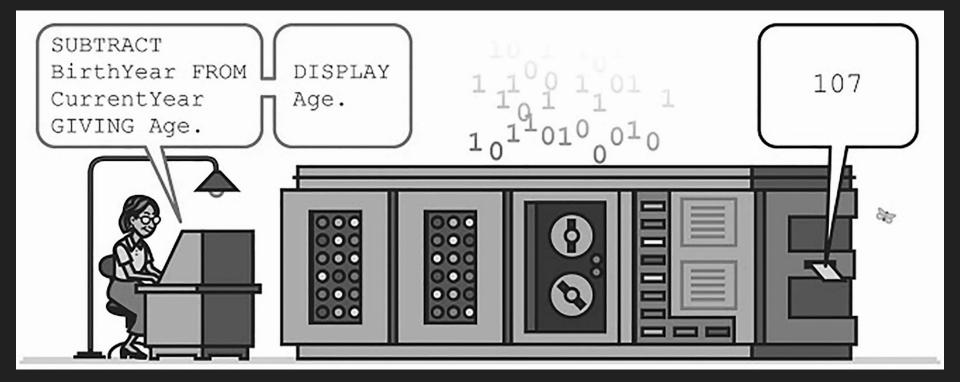
The OCCURS clause marks an array.

The DEPENDING ON clause marks a counter field for the array, if one exists.

The array ASSIGMENTS is a nested array within COURSES.

```
01   STUDENT.
   20   ID
   20   FIRST_NAME
   20   LAST_NAME
 *
   20   DATE_OF_BIRTH
   20   NUMOF_COURSES
   20   NUMOF_BOOKS
   20   COURSES.
      25 COURSE OCCURS 8 TI
         30   COURSE_ID
         30   COURSE_TITLE
         30   INSTRUCTOR_ID
         30   NUMOF_ASSIGNMEN
         30   ASSIGNMENTS OCC
            40   ASSIGNMENT_TY
            40   ASSIGNMENT_TI
 *
            40   DUE_DATE
            40   GRADE
   20   BOOKS.
      25   BOOK OCCURS 1 TO
         30   ISBN
 *
         30   RETURN_DATE
```

`_ASSIGNMENTS.`

`KS.`

```
YYYYMMDD
PIC 9(8) COMP.
```

C O B O L

Report to
  CONFERENCE on DATA
  SYSTEMS LANGUAGES

Including
  INITIAL   SPECIFICATIONS
  for a COMMON BUSINESS
  ORIENTED LANGUAGE (COBOL)
  for Programming
  Electronic Digital Computers

DEPARTMENT OF DEFENSE   APRIL 1960

Automated Programming

Autonomous APIs

Demo #2

Autonomous APIs

Every API before 2020

Publish API 💻

🧑‍💼 Document API

Find API, Read Docs, Program Client 🧑🏾

📱 Consume API

Autonomous API

Publish API 💻

📱 Find & Consume API

Augmenting
Human Intellect

Vague but exciting ...

CERN DD/OC

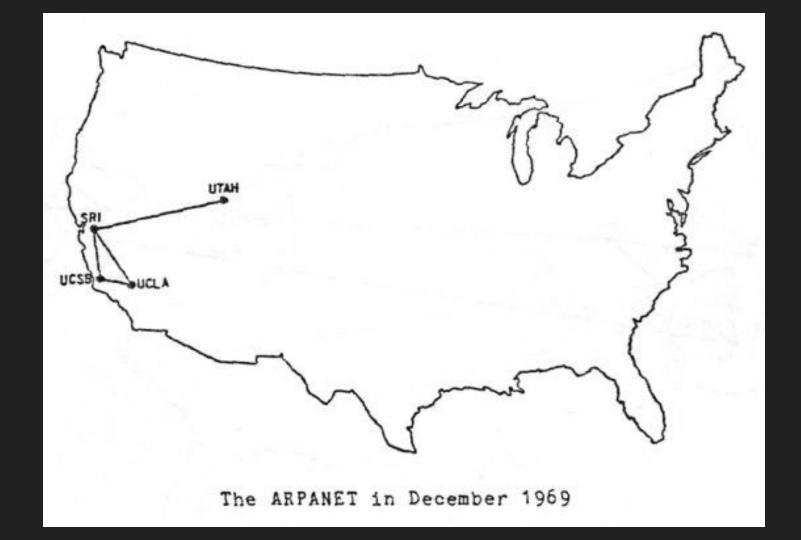Tim Berners-Lee, CERN/DD

Information Management: A Proposal

March 1989

Information Management: A Proposal

Abstract

This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext sytstem.

Keywords: Hypertext, Computer conferencing, Document retrieval, Information management, Project control

The ARPANET in December 1969

ADVANCED RESEARCH PROJECTS AGENCY
Washington 25, D. C.

April 25, 1963

MEMORANDUM FOR: Members and Affiliates of the Intergalactic Computer Network

FROM : J. C. R. Licklider

SUBJECT : Topics for Discussion at the Forthcoming Meeting

First, I apologize humbly for having to postpone the meeting scheduled for 3 May 1963 in Palo Alto. The ARPA Command & Control Research office has just been assigned a new task that must be activated immediately, and I must devote the whole of the coming week to it. The priority is externally enforced. I am extremely sorry to inconvenience those of you who have made plans for May 3rd. Inasmuch as I shall be in Cambridge the rest of this week, I am asking my colleagues here to re-schedule the meeting, with May 10th, Palo Alto, as target time and place.

ADVANCED RESEARCH PROJECTS AGENCY
Washington 25, D. C.

April 25, 1963

MEMORANDUM FOR: Members and Affiliates of the Intergalactic
Computer Network

At this extreme, the problem is essentially the one discussed by science fiction writers: "How do you get communications started among totally uncorrelated "sapient" beings?"

First, I apologize humbly for having to postpone the meeting scheduled for 3 May 1963 in Palo Alto. The ARPA Command & Control Research office has just been assigned a new task that must be activated immediately, and I must devote the whole of the coming week to it. The priority is externally enforced. I am extremely sorry to inconvenience those of you who have made plans for May 3rd. Inasmuch as I shall be in Cambridge the rest of this week, I am asking my colleagues here to re-schedule the meeting, with May 10th, Palo Alto, as target time and place.
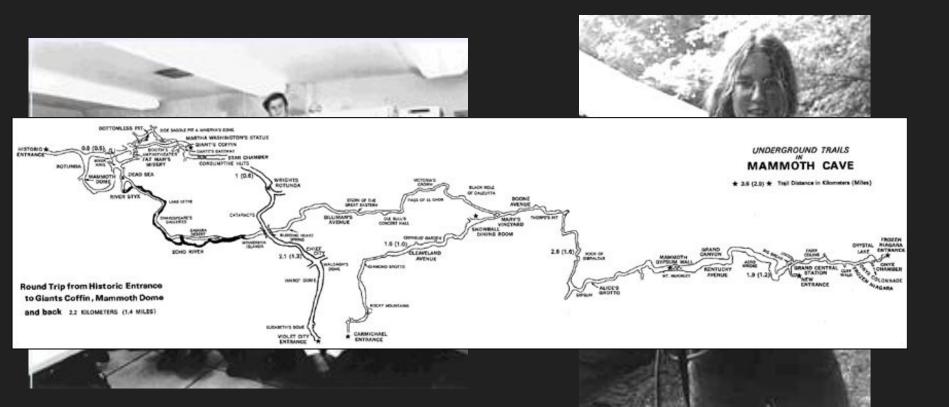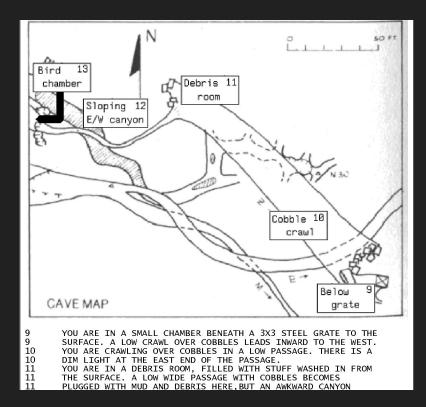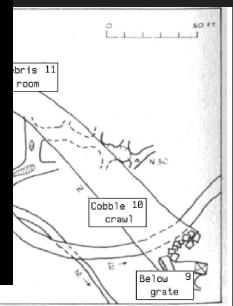
UNDERGROUND TRAILS
IN
MAMMOTH CAVE

★ 3.6 (2.9) ★   Trail Distance in Kilometers (Miles)

Round Trip from Historic Entrance
to Giants Coffin, Mammoth Dome
and back 2.2 KILOMETERS (1.4 MILES)

CAVE MAP

```
9     YOU ARE IN A SMALL CHAMBER BENEATH A 3X3 STEEL GRATE TO THE
9     SURFACE. A LOW CRAWL OVER COBBLES LEADS INWARD TO THE WEST.
10    YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A
10    DIM LIGHT AT THE EAST END OF THE PASSAGE.
11    YOU ARE IN A DEBRIS ROOM, FILLED WITH STUFF WASHED IN FROM
11    THE SURFACE. A LOW WIDE PASSAGE WITH COBBLES BECOMES
11    PLUGGED WITH MUD AND DEBRIS HERE,BUT AN AWKWARD CANYON
```

```
PAUSE  INIT DONE statement executed
To resume execution, type go.  Other input will terminate the job.
go
Execution resumes after PAUSE.
 WELCOME TO ADVENTURE!!  WOULD YOU LIKE INSTRUCTIONS?


y
 SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND
 FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED
 THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID
 TO WORK IN THE CAVE.  I WILL BE YOUR EYES AND HANDS. DIRECT
 ME WITH COMMANDS OF 1 OR 2 WORDS.
 (ERRORS, SUGGESTIONS, COMPLAINTS TO CROWTHER)
 (IF STUCK TYPE HELP FOR SOME HINTS)


 YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK
 BUILDING . AROUND YOU IS A FOREST. A SMALL
 STREAM FLOWS OUT OF THE BUILDING AND DOWN A GULLY.
```
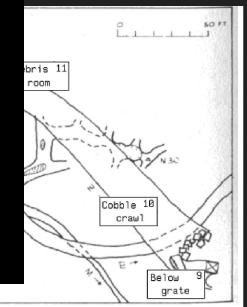

CAVE MAP

```
9        YOU ARE IN A SMALL CHAMBER BENEATH A 3X3 STEEL GRATE TO THE
9        SURFACE. A LOW CRAWL OVER COBBLES LEADS INWARD TO THE WEST.
10       YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A
10       DIM LIGHT AT THE EAST END OF THE PASSAGE.
11       YOU ARE IN A DEBRIS ROOM, FILLED WITH STUFF WASHED IN FROM
11       THE SURFACE. A LOW WIDE PASSAGE WITH COBBLES BECOMES
11       PLUGGED WITH MUD AND DEBRIS HERE,BUT AN AWKWARD CANYON
```

PAUSE   INIT DONE statement executed
To resume execution, type go. Other input will terminate the job.
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 SOMEWHERE NEARBY IS COLOSSAL
 FORTUNES IN TREASURE AND GOL
 THAT SOME WHO ENTER ARE NEVE
 TO WORK IN THE CAVE. I WILL
 ME WITH COMMANDS OF 1 OR 2 W
 (ERRORS, SUGGESTIONS, COMPLA
 (IF STUCK TYPE HELP FOR SOME

 YOU ARE STANDING AT THE END
 BUILDING . AROUND YOU IS A F
 STREAM FLOWS OUT OF THE BUIL

9   A SMALL CHAMBER BENEATH A 3X3 STEEL GRATE TO THE
         SURFACE. A LOW CRAWL OVER COBBLES LEADS INWARD TO THE WEST.
10   YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A
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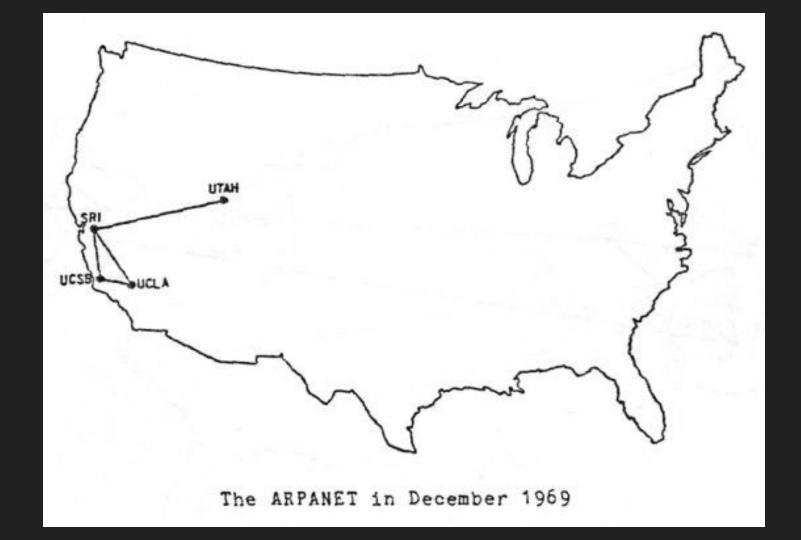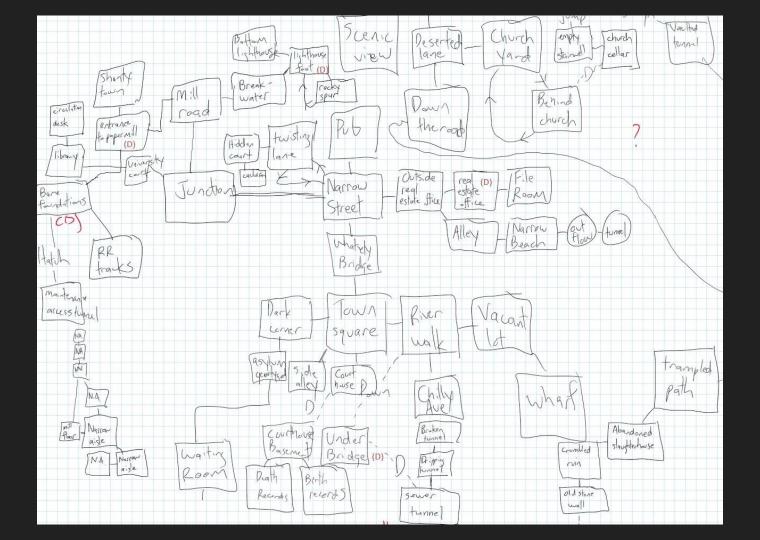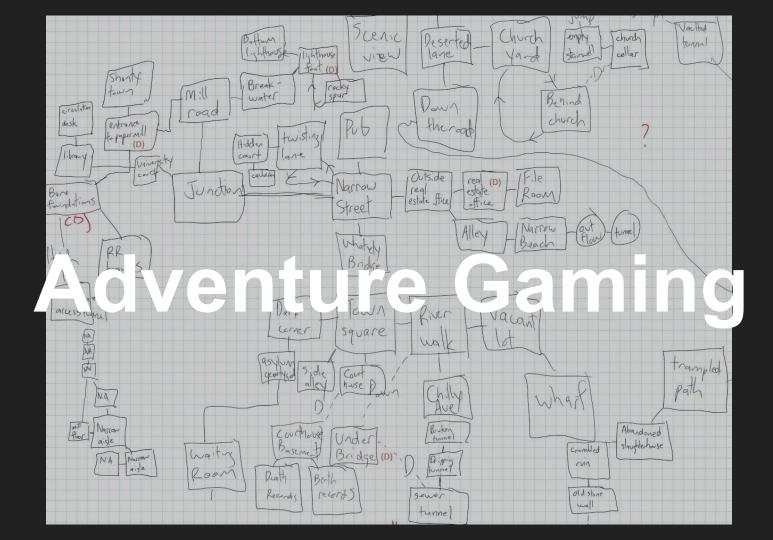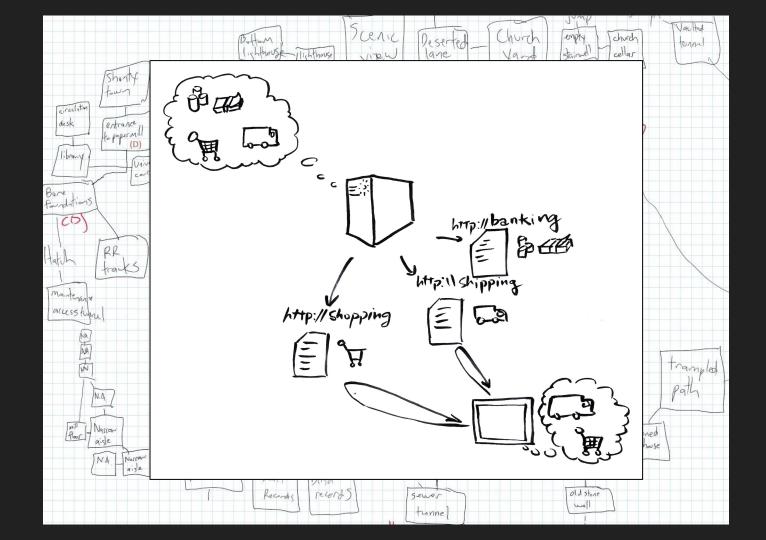11   PLUGGED WITH MUD AND DEBRIS HERE,BUT AN AWKWARD CANYON

ebris 11
 room

Cobble 10
 crawl

Below   9
 grate

The ARPANET in December 1969

Bottom lighthouse · lighthouse foot (D) · Scenic view · Deserted lane · Church Yard · empty stairwell · church cellar · Vaulted tunnel

Shanty town · Mill road · Break-water · rocky spur · Behind church · Down the road · ?

circulation desk · entrance to papermill (D) · Pub · twisting lane · Hidden court

library · University court · Junction · Narrow Street · Outside real estate office · real estate office (D) · File Room

Bare Foundations (D) · caldera · Alley · Narrow Beach · out flow · tunnel

Hatch · RR tracks · Whately Bridge

maintenance access tunnel · Dark corner · Town square · River walk · Vacant lot

NA · NA · NN · asylum courtyard · side alley · Court house Down · Chilly Ave · wharf · trampled path

N.A. · Broken tunnel · Abandoned slaughterhouse

mill floor · Narrow aisle · Courthouse Basement · Under Bridge (D) · Dripping tunnel · crumbled ruin

N.A. · Narrow aisle · Waiting Room · Death Records · Birth records · sewer tunnel · old stone wall

Adventure Gaming

http://banking

http://shipping

http://shopping

Adventure APIs

Demo #3

```
┌ʼFSʼ┐   FORWARD      STATEMENT
└     ┘

·2   (INCHAR) PROCEDURE; .SCR=1;

·2A  DECLARE NCHAR=80, MCHAR=80, MAXCH=80, LINE[80], I ;

·2B  DECLARE EXTERNAL LIST=1, NLINE=0, LF=153B, CR=155B,

·2C  DECLARE STAR='  *',ARROW='  ↑', PEEKED=0;

·2D  IF PEEKED THEN

·2E  IF NCHAR .GE MCHAR
                                        ↑
·2F  RETURN(LINE[NCHAR]);

·2G  ENTRY (PERR);

·2H  ENDP. .DSN=0; .LSP=5; .INS=3; .SCR=2; .RES;
```

What if the provider goes down?

Call-to-Action

superface

communication protocol for autonomous APIs

superface

http://superface.ai
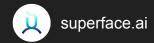
superface objectives
communication protocol for autonomous APIs

superface.ai
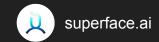
- Easy to use with existing APIs
- Resiliency of clients
- Redundancy in providers
- Reuse of providers
- Reduce the drudgery of hand -writing, -reading and eyeballing documentation for changes

- Independent and effortless evolution of servers and clients
- No longer prone to human-inside errors
- Address API vendor lock-in
- Abstract away implementation details including API styles (REST, GraphQL, gRPC…)
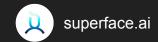
superface available in 2020
communication protocol for autonomous APIs

superface.ai
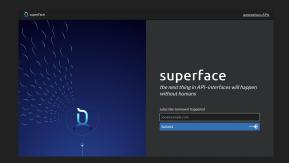
- Complete superface open-source stack coming in Q1 2020
- Commercial support available later in 2020

superface available in 2020
communication protocol for autonomous APIs

No more vendor lock-in, no more broken clients, no more outdated documentation, no more coordinated deployments ….

superface

http://superface.ai ~ hello@superface.ai

The Mother of All APIs

From Engelbart to the Present

http://superface.ai ~ hello@superface.ai

Mike Amundsen
@mamund

Zdenek Nemec
@zdne