what is ZoIP?

open source

game engine

runs over phone

virtual reality

really virtual

no consoles


XBOX 360


XBOX360

no video cards


ATI
ATI Radeon

no fancy controllers


Microsoft

your only I/O device

is a phone

visualize world
in your mind

remember

not a game

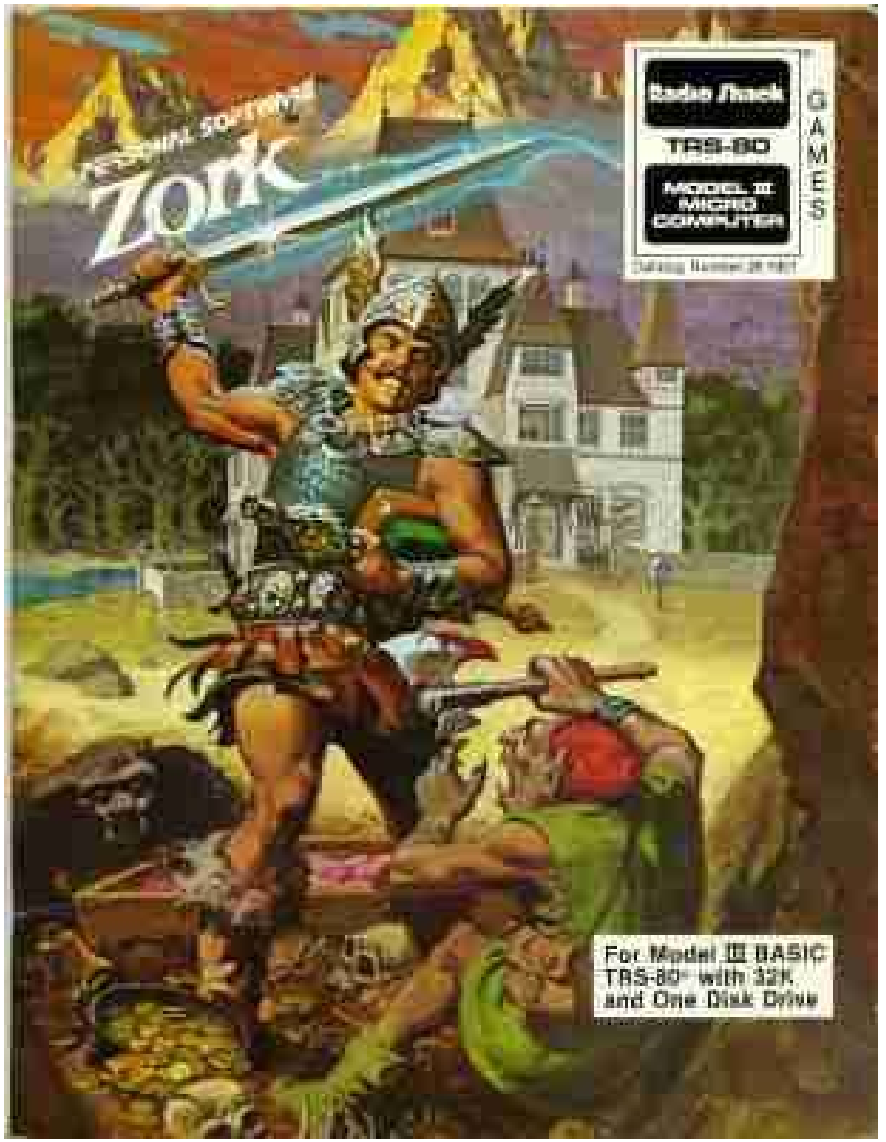
a game engine

like an xbox


XBOX 360

one game it runs

Zork


PERSONAL SOFTWARE
Zork
Radio Shack
TRS-80
MODEL III
MICRO COMPUTER
GAMES
For Model III BASIC
TRS-80® with 32K
and One Disk Drive

Why Zork?

entertaining

novel

when you say...

imersive interactive environments for your telephone

? ? ?

interactive fiction

? ? ?

it's zork...

on the phone

point of reference

sometimes

okay maybe not

Zork

Interactive Fiction

like

choose your own adventure book

1977 - 1978

MIT

Dynamic Modelling Group

on PDP-10


PDP-10


KL10

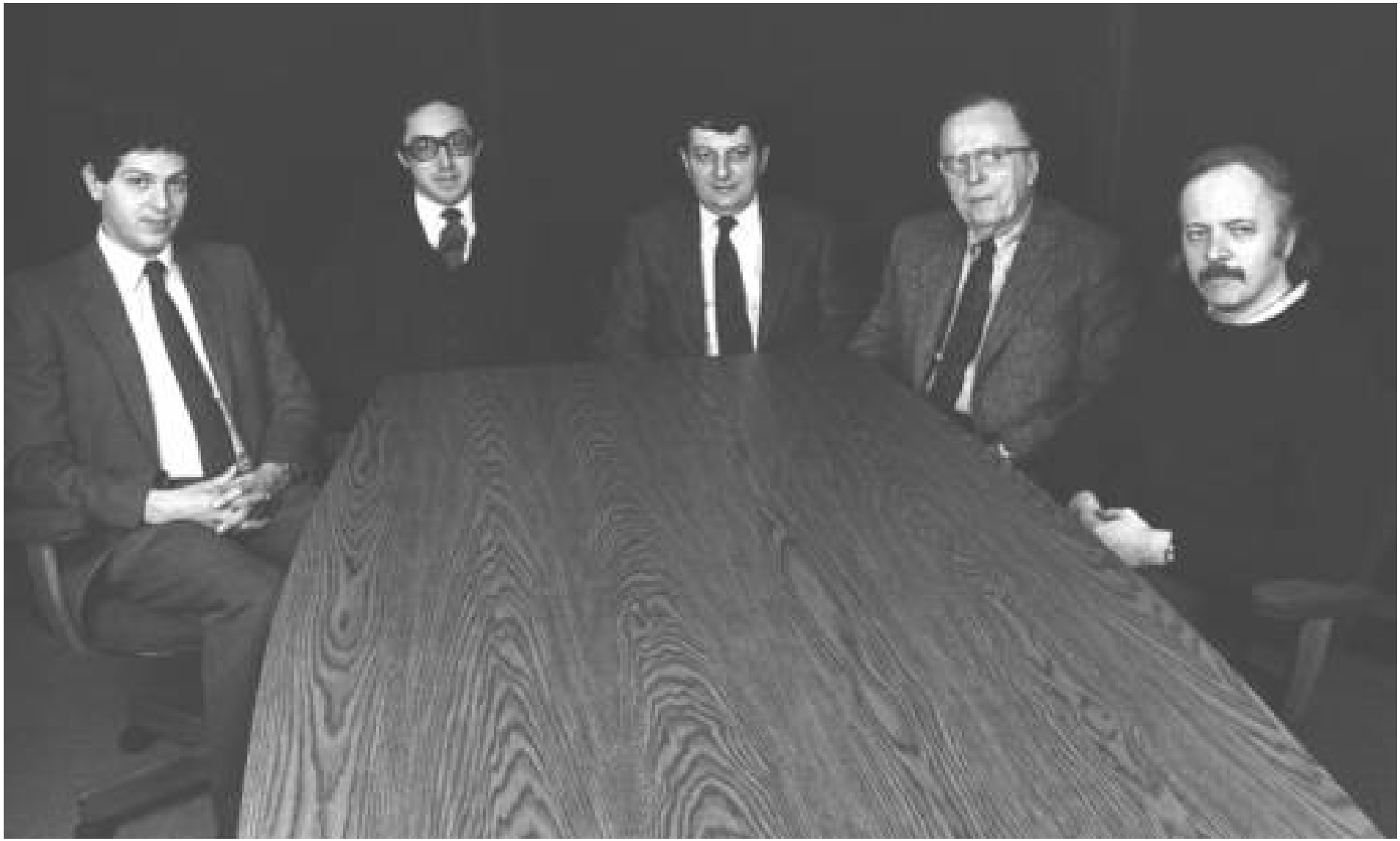
one-up

“Adventure”

wow this is cool

started a company

Infocom



released about 40 games in 80's

now...

it's been awhile for some of us

refresher

>look

It is pitch black.
You are likely to
be eaten by a grue.

>turn on lantern

The brass lantern is now on.

The Troll Room

This is a small room with passages to the east & south. Bloodstains & deep scratches mar the walls.

A nasty-looking troll, brandishing a bloody axe, blocks all passages out of the room.

The axe gets you right in the side. Ouch!

fast forward to the 21st century…

{press F12}

sounded pretty good

I cheated a bit

that was Cepstral's voice

Festival sounds like this...

{press F11}

how did I get here?

incrementally

built simple Perl AGI's

retrieve weather and read back

“Today, cloudy with a high of 21…”

simple DTMF

“you pressed 1, 2, 3”

then

found z-machine

written in perl

called Rezrov

z-machine

bytecode interpreter

interprets Infocom game bytecode

like Zork

Rezrov made it easy

abstracted I/O

replaced print

with speak

read text

with read DTMF

version 0.1

thanksgiving

found sphinx2 example in Perl

tested with small set

north, south, east, west

placed many test calls

“north…”

<tweak tweak>

“north…”

<tweak tweak>

“north…”

it worked!

replaced read DTMF

with record and recognize

version 0.2

internals simple

1: create z-machine

```
1: create z-machine
2: load zork bytecode into z-machine
```

2: load zork bytecode into z-machine

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
```

loop start:

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
```

3: create audio for text

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
```

4: playback audio

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
```

5: <beep>

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
    3: create audio for text
    4: playback audio
    5: <beep>
    6: begin recording
```

6: begin recording

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
    3: create audio for text
    4: playback audio
    5: <beep>
    6: begin recording
    7: listen for talking followed by silence
```

7: listen for talking

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
    3: create audio for text
    4: playback audio
    5: <beep>
    6: begin recording
    7: listen for talking (followed by silence)
```

“kill troll with sword”

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
```

followed by silence

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
```

“ ”

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <busy>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
```

8: send recording to sphinx2

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
```

00101011010101101
01010110101011010

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for speaking followed by silence
   8: send recording to sphinx2
   9: recognize speech
```

9: recognize speech

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
    3: create audio for text
    4: playback audio
    5: <beep>
    6: begin recording
    7: listen for speaking for a while
    8: send recording to sphinx2
    9: recognize speech
    10: text is returned
```

10: text is returned

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
   9: recognize speech
   10: text is returned
```

<kill troll with north>

11: create audio file for what sphinx2 thinks you said

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
  3: create audio for text
  4: playback audio
  5: <beep>
  6: begin recording
  7: listen for talking followed by silence
  8: send recording to sphinx2
  9: recognize speech
  10: text is returned
  11: create audio file for what sphinx2
      thinks you said repeat it back to you
```

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: stop recording when silence
   8: send recording to sphinx2
   9: recognize speech
   10: text is returned
   11: create audio file for what sphinx2
       thinks you said repeat it back to you
```

repeat it back to you

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: sleep>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
   9: recognize speech
   10: text is returned
   11: create audio file for what sphinx2
       thinks you said repeat it back to you
```

“You said: kill troll with north”

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
   9: recognize speech
   10: text is returned
   11: create audio file for what sphinx2
       thinks you said repeat it back to you
   12: type text into the game on your behalf
```

12: type text into the game on your behalf

```
1: create z-machine
2: load zork bytecode into z-machine
loop start:
   3: create audio for text
   4: playback audio
   5: <beep>
   6: begin recording
   7: listen for talking followed by silence
   8: send recording to sphinx2
   9: recognize speech
   10: text is returned
   11: create audio file for what sphinx2
       thinks you said repeat it back to you
   12: type text into the game on your behalf
goto start
```

goto start

from there

incremental
improvements

created large word list

no sentences

just words

didn't work so hot

modelling tools

created model with no grammar

without grammar

sentence structure uknown

“sack eat”

just as valid as

“go east”

sphinx2 has no hope

grammar needed

for long sentences

without grammar

binomial coefficients come into play

remember finite?

n choose k

n items

k spots to use them

$$n! / k! (n - k)!$$

n!?

n factorial

$$n! \equiv (n) \times (n-1) \times (n-2) \times (n-3) \times \ldots (n-(n-1))$$

$$n! / k! (n - k)!$$

n = 200

$$k = 2$$

19,900
combinations

$$k = 3$$

1,313,400
combinations

$$k = 4$$

64,684,950
combinations

$$k = 5$$

2,535,650,040
combinations

grammars important

how do you make good grammars?

not quite sure yet

but like most OSS speech research

it starts at CMU

http://www.speech.cs.cmu.edu/SLM/toolkit.html

so…

this is “cool”…

but

what does ZoIP give us?

new style IVR

spatial cues

virtual reality

there are also

interesting design tools

like “Inform” IDE

ZoIP.inform - Inform

File Edit Game Window Help

Go! Source Documentation

Source | Errors | Index | Skein | Transcript | Game | Documentation

"ZoIP" by Simon Paul Ditner

The Lobby is a room. "You are standing in the lobby of Acme Corp. A receptionist works diligently behind a large desk. To the east is the Billing Department, to the west is Sales, and up a staircase at the back of the room is Customer Support."
The receptionist is scenery and a person in the Lobby.
The description of the receptionist is "The receptionist is quite striking."
The desk is scenery in the Lobby.
The description of the desk is "The desk is made of solid oak."
Instead of taking the desk, say "It's far too heavy to lift."

A room called Support Office is above the Lobby. "You are in the customer support office. A bullpen stretches as far as the eye can see. Support staff answer calls non-stop."
The service bell is in the Support Office.
Ringing is an action applying to one visible thing.
Understand "ring [something]" as ringing.
After ringing the service bell, say "Ding!"

A room called Billing is east of the Lobby. "You are in the billing department, surrounded by stacks of paper."

A room called Sales is west of the Lobby. "You are in the sales office, people in navy power suits strut around, giving each other high-fives."

A room called The Dungeon is below the Lobby. "It is dark down here, you are likely to be eaten by a grue."

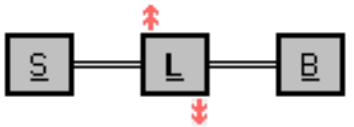
Source | Errors | Index | Skein | Transcript | Game | Documentation | Settings

Actions | Contents | Kinds | Phrasebook | Rules | Scenes | World

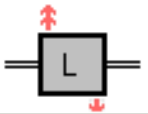
World

Map of first level up

Map of starting level



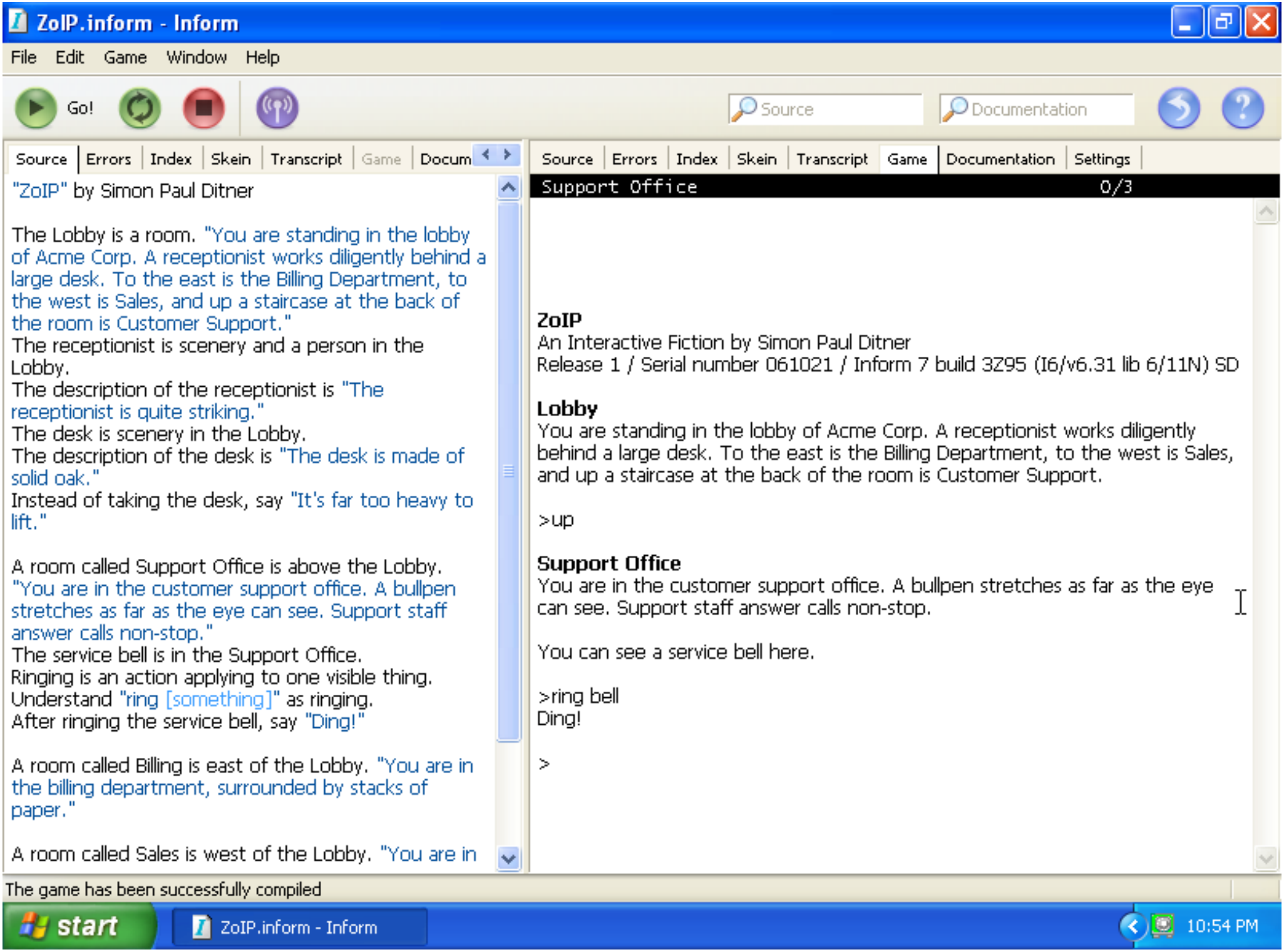
Map of first level down



Lobby - *room where play begins*
receptionist - *person*
desk

The game has been successfully compiled

start ZoIP.inform - Inform 10:53 PM


ZoIP.inform - Inform
File Edit Game Window Help
Go!
Source
Documentation
Source Errors Index Skein Transcript Game Docum
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Ringing is an action applying to one visible thing.
Understand "ring [something]" as ringing.
After ringing the service bell, say "Ding!"
A room called Billing is east of the Lobby. "You are in the billing department, surrounded by stacks of paper."
A room called Sales is west of the Lobby. "You are in
Source Errors Index Skein Transcript Game Documentation Settings
Support Office 0/3
ZoIP
An Interactive Fiction by Simon Paul Ditner
Release 1 / Serial number 061021 / Inform 7 build 3Z95 (I6/v6.31 lib 6/11N) SD
Lobby
You are standing in the lobby of Acme Corp. A receptionist works diligently behind a large desk. To the east is the Billing Department, to the west is Sales, and up a staircase at the back of the room is Customer Support.
>up
Support Office
You are in the customer support office. A bullpen stretches as far as the eye can see. Support staff answer calls non-stop.
You can see a service bell here.
>ring bell
Ding!
>
The game has been successfully compiled
start
ZoIP.inform - Inform
10:54 PM

designed for authors

domain specific

“natural” language

for modelling

- evironments

- objects

- actions

instead of

```
my $foyer = new Room();
$foyer->descr( “You are standing in the lobby” .
                “ of Acme Corp.” );

my $desk = new Object();
$desk->descr( “The desk is made of oak.” );
$desk->attribute( FIXED );

$foyer->add_object( $desk );
```

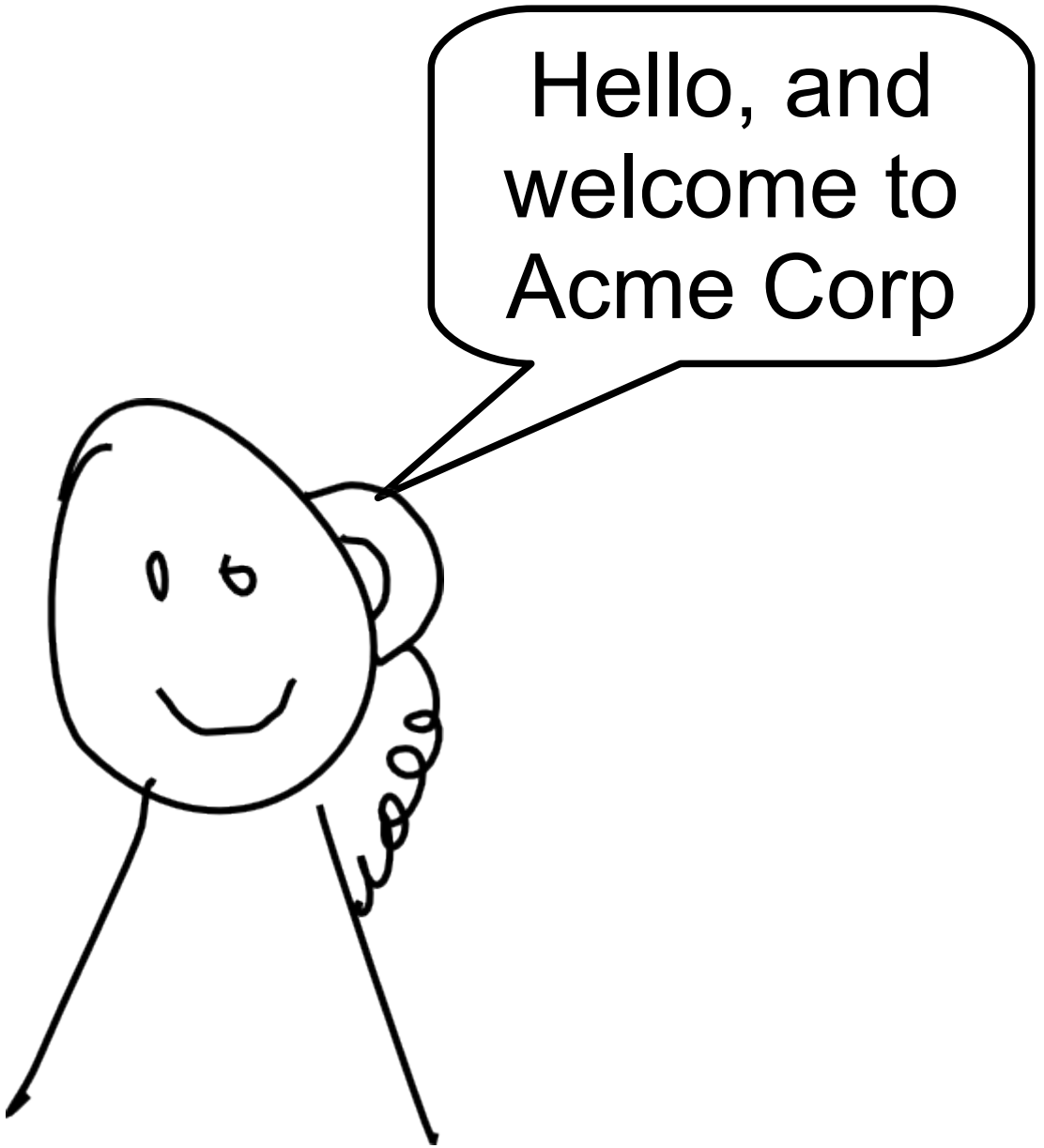
say it “naturally”

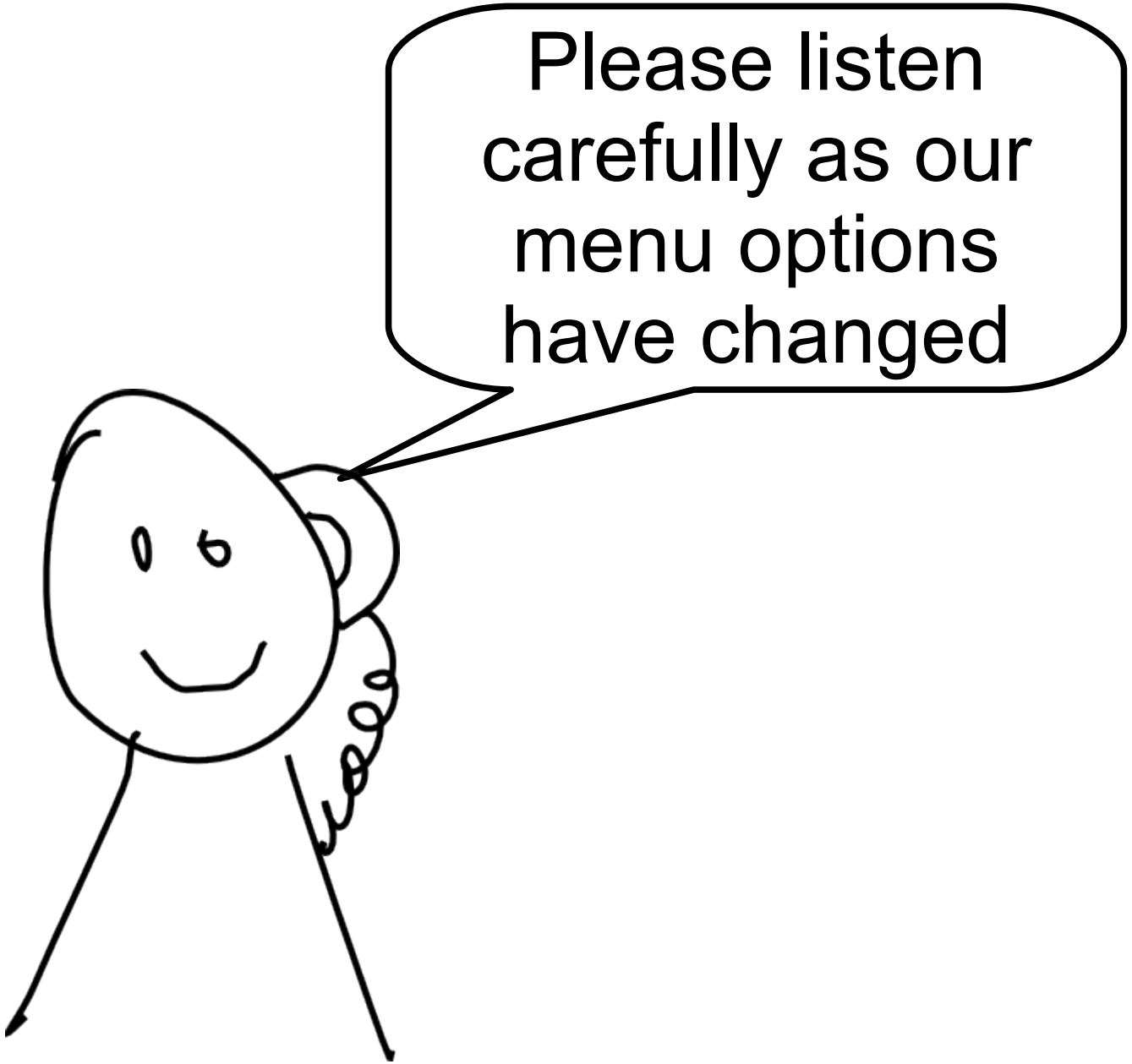
```
The Lobby is a room. “You are standing in the
lobby of Acme Corp.”

The desk is scenery in the Lobby.
The description of the desk is “The desk is made
of oak.”
```

an example

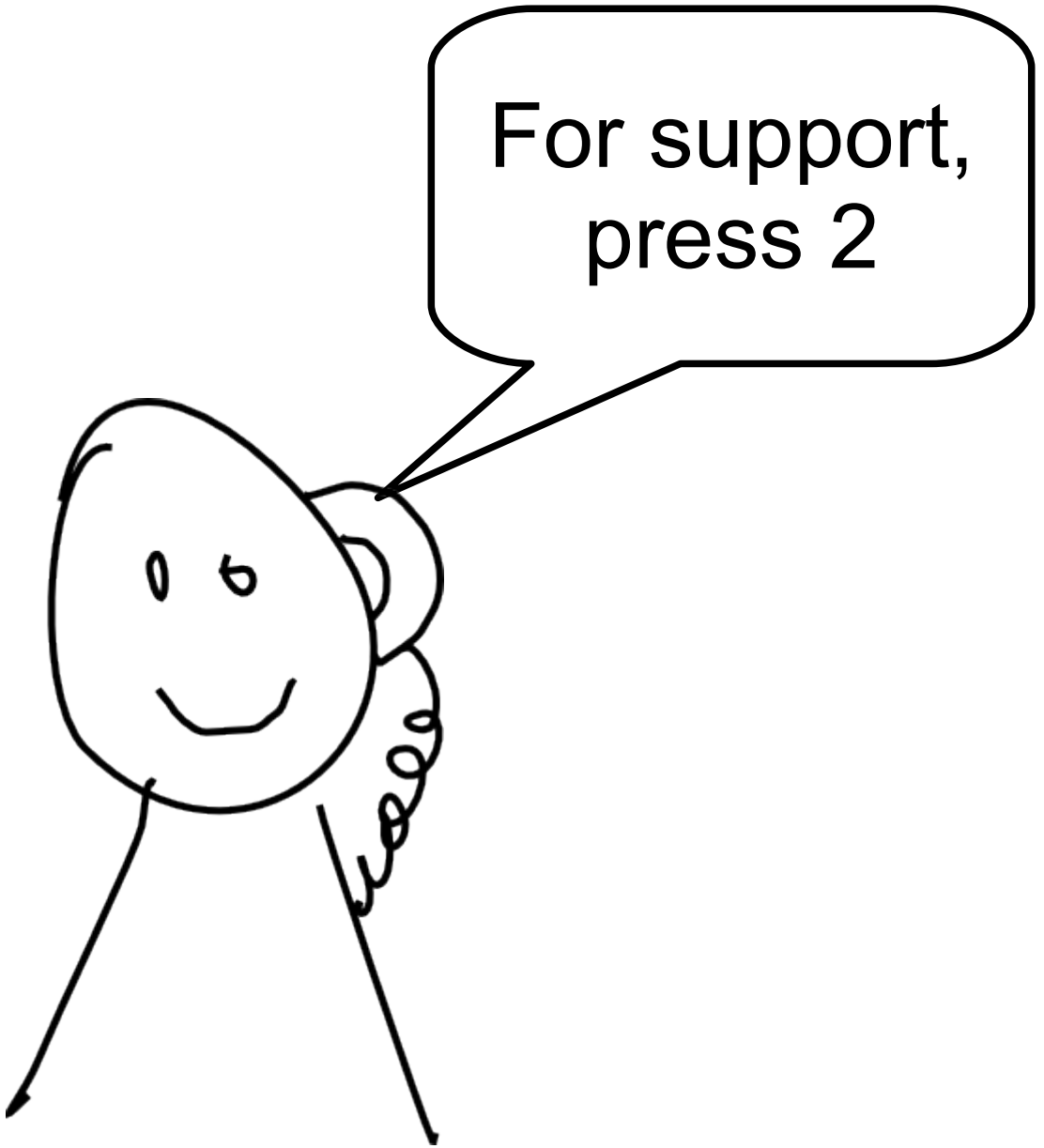
traditional IVR's confusing

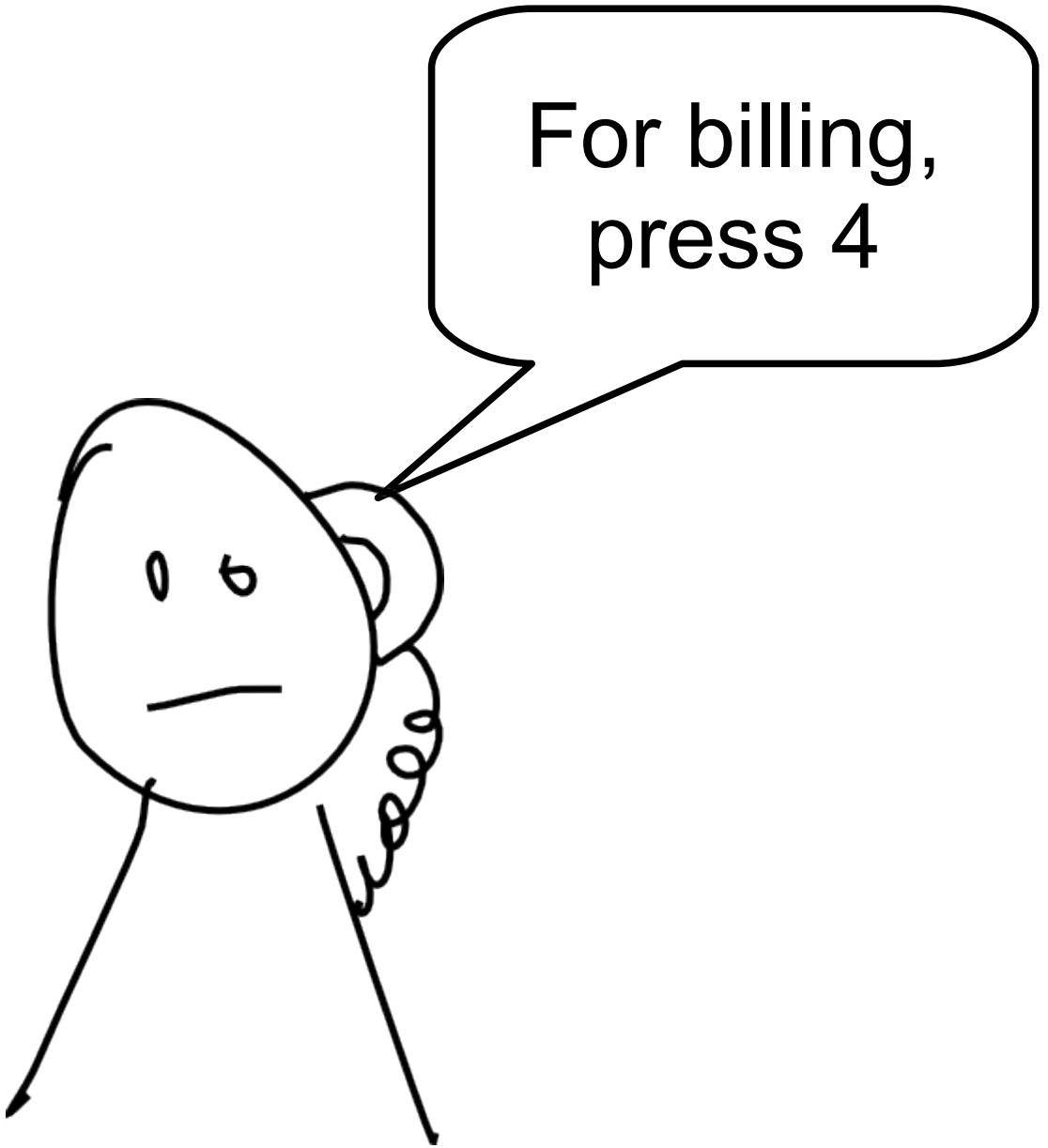
to spatial minded


Hello, and
welcome to
Acme Corp


Please listen carefully as our menu options have changed

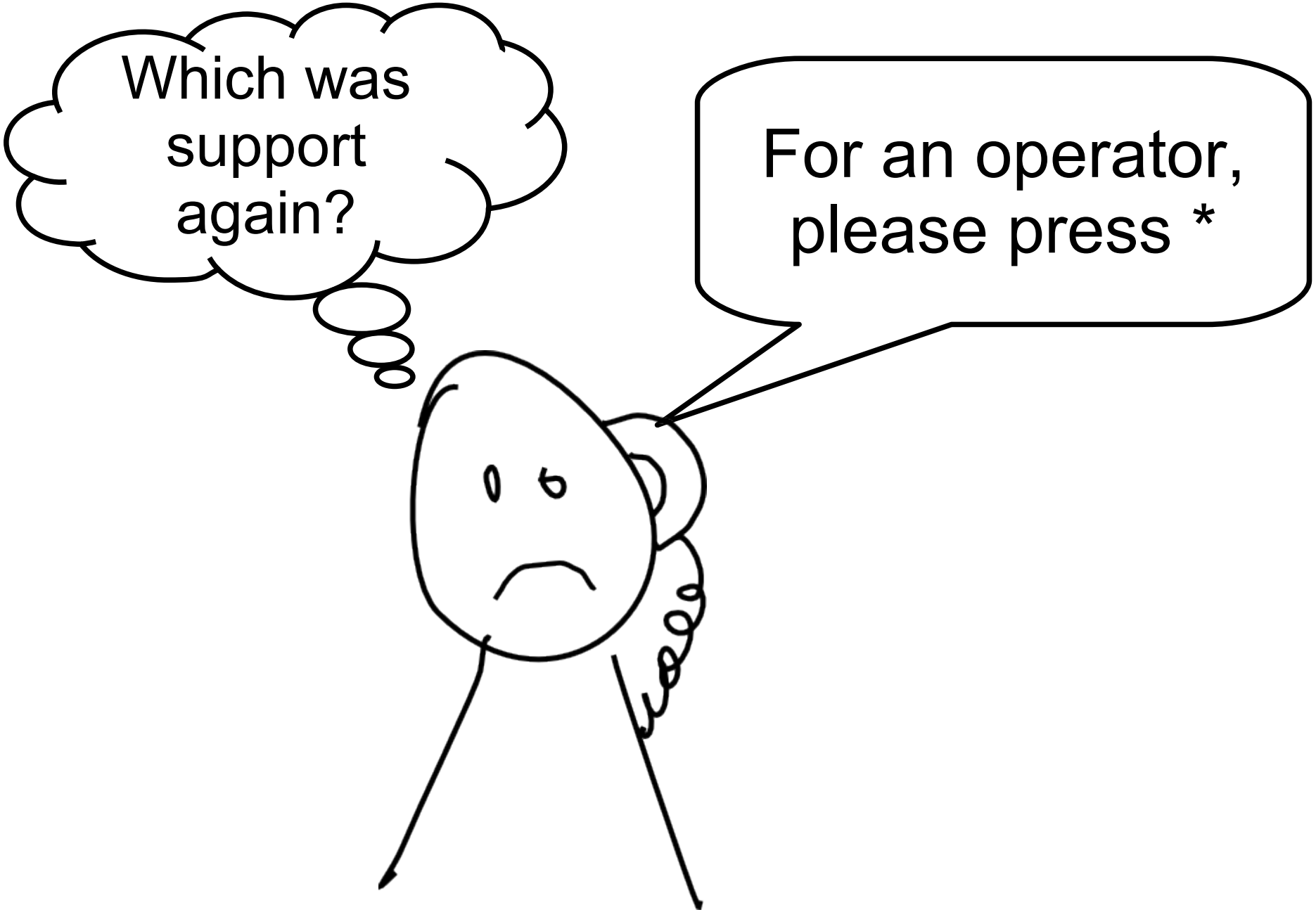

For sales,
press 1


For support,
press 2


For billing,
press 4


To check your account balance, press 6


For our corporate directory, please press #


Which was support again?
For an operator, please press *

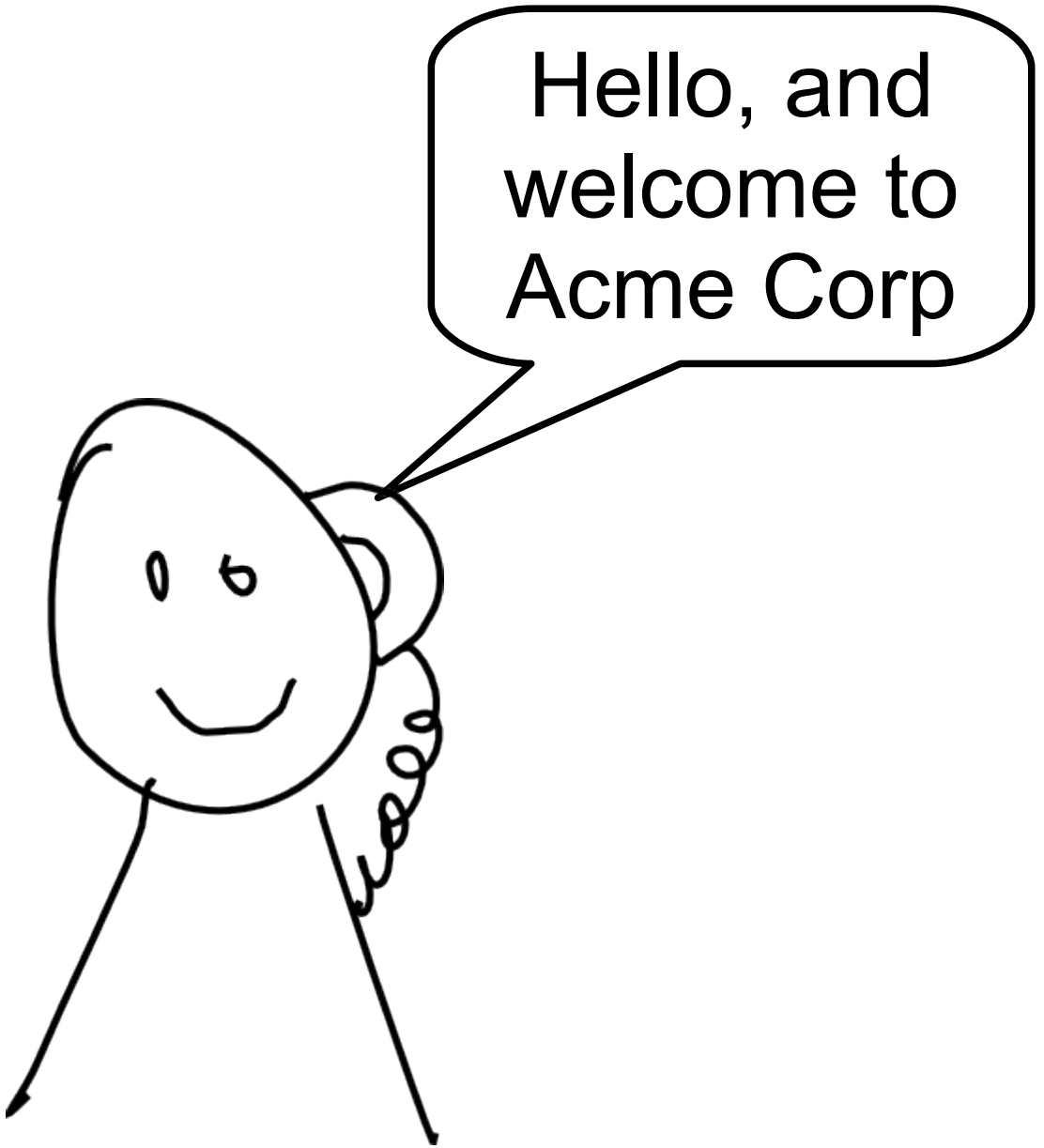
memory good for about 3 phrases

{which was support?}

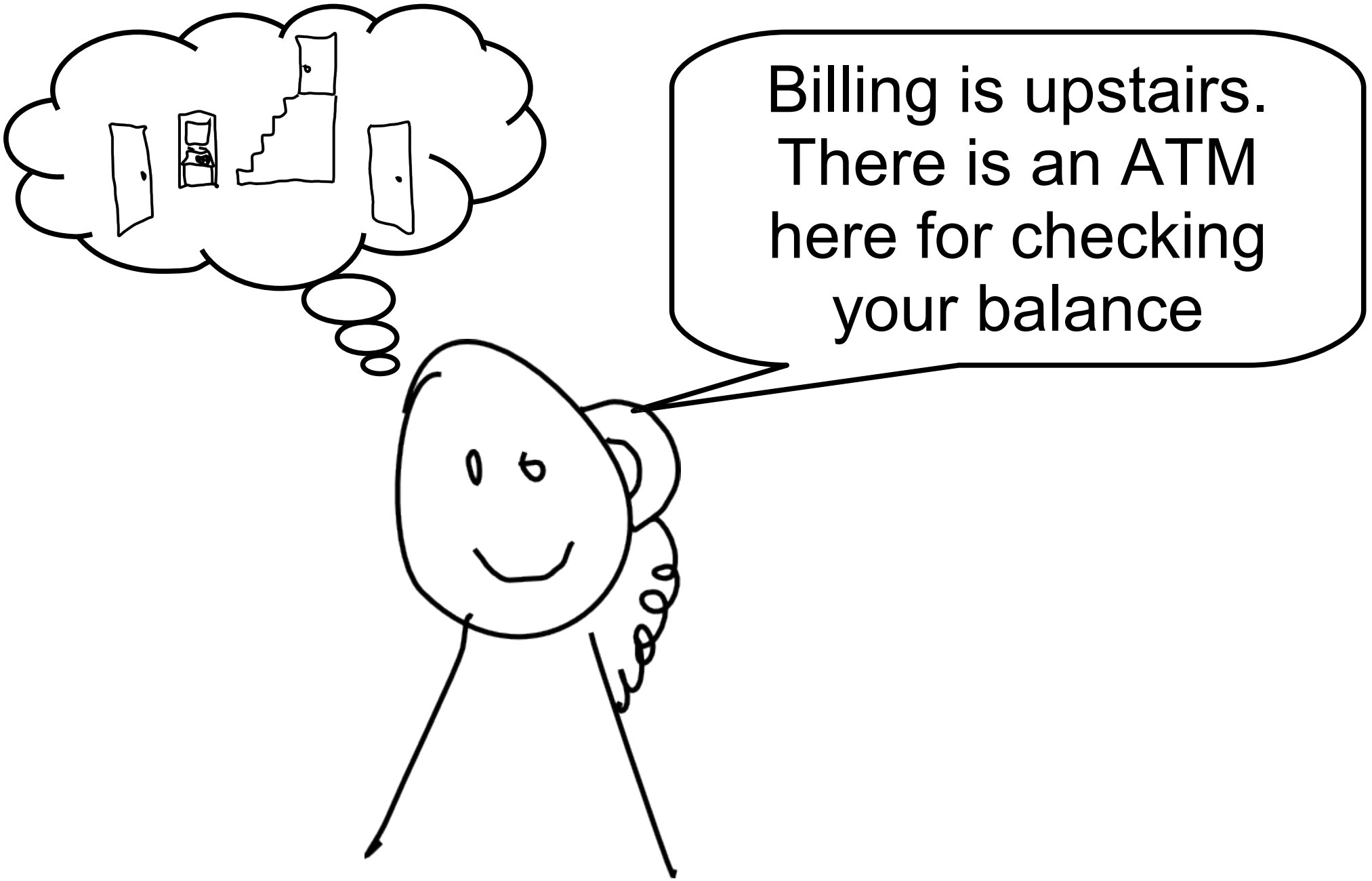
visual memory good for 7 – 12 objects

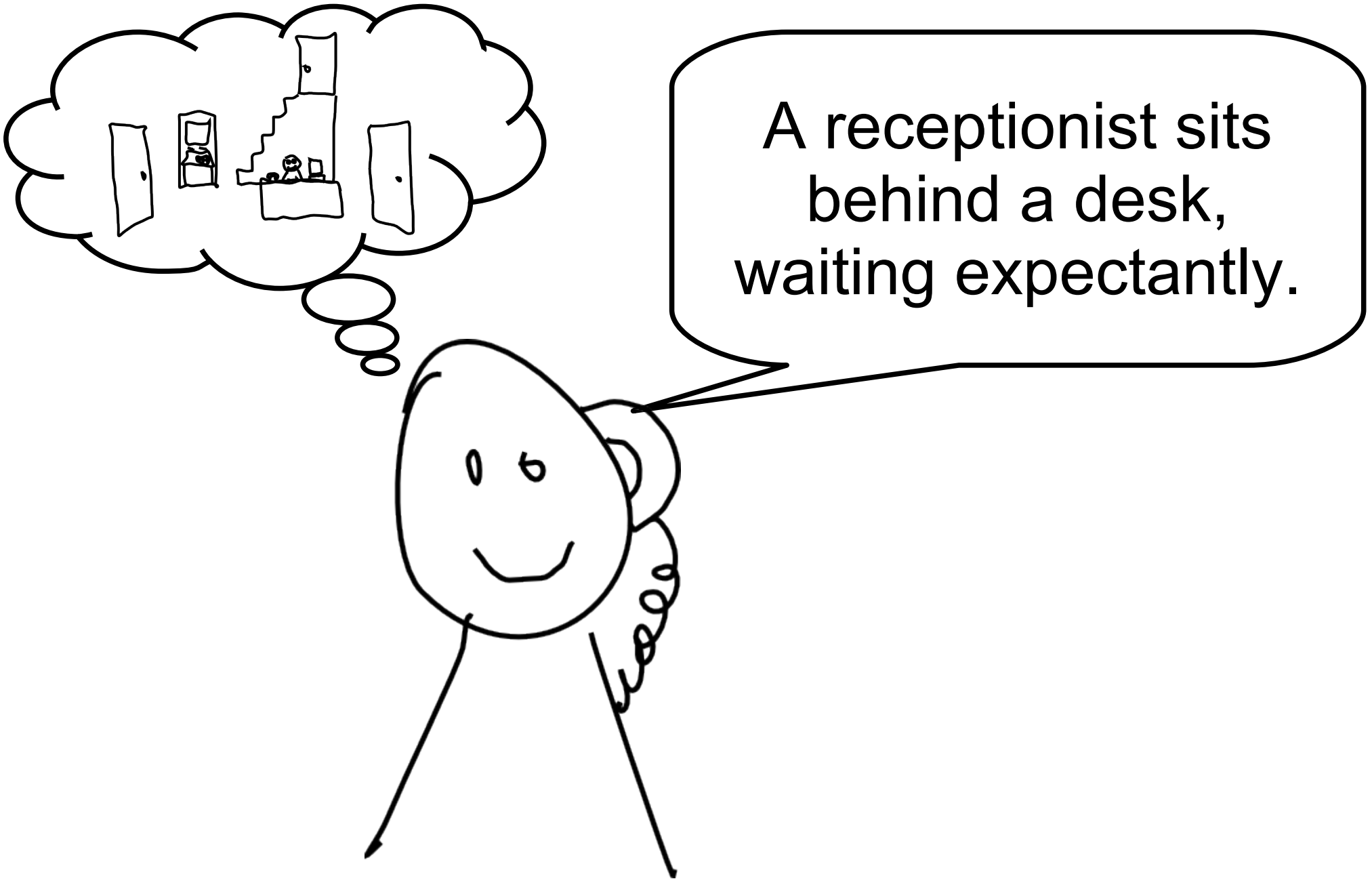
lets take advantage

of visual memory


Hello, and
welcome to
Acme Corp


You are in the Lobby. To the west is sales, to the east is support


Billing is upstairs. There is an ATM here for checking your balance


A receptionist sits behind a desk, waiting expectantly.

{where is support?}

memorable?

less error prone?

maybe

allows for

- richer environments

richer environments

- richer environments
- complex user interaction

complex user interaction

- richer environments
- complex user interaction
- have a sense of place

have a sense of place

- richer environments
- complex user interaction
- have a sense of place
- interact with environment

interact with environment

- richer environments
- complex user interaction
- have a sense of place
- interact with environment
- carry objects

carry objects

- richer environments
- complex user interaction
- have a sense of place
- interact with environment
- carry objects
- manipulate objects

manipulate objects

- richer environments
- complex user interaction
- have a sense of place
- interact with environment
- carry objects
- manipulate objects

is this better?

more than a novelty?

not sure…

need more testing

more “real” applications

conferencing servers

oral culture archives

query / response systems

what do you think?

{fin}

play zork now

Canada	416-548-7557
USA	712-432-7945
Internet	sip://zoip@demo.zoip.org
Website	http://zoip.org