



AIML 2.0
Virtual Assistant Technology
for a
Mobile Era

Dr. Richard S. Wallace

```
<category>
  <pattern>WHO ARE YOU</pattern>
  <template>I am ALICE. Who are you?
</template>
</category>
```

```
<category>
  <pattern>DO YOU KNOW WHO * IS</pattern>
  <template><srai>WHO IS <star/></srai>
</template>
</category>
```

AIML 1.0



Bot

Categories

Minimum believable
character

10,000

ALICE

100,000

Mitsuku


250,000

Professor (Chomsky)

580,000

Classic AIML Bots

PROGRAM



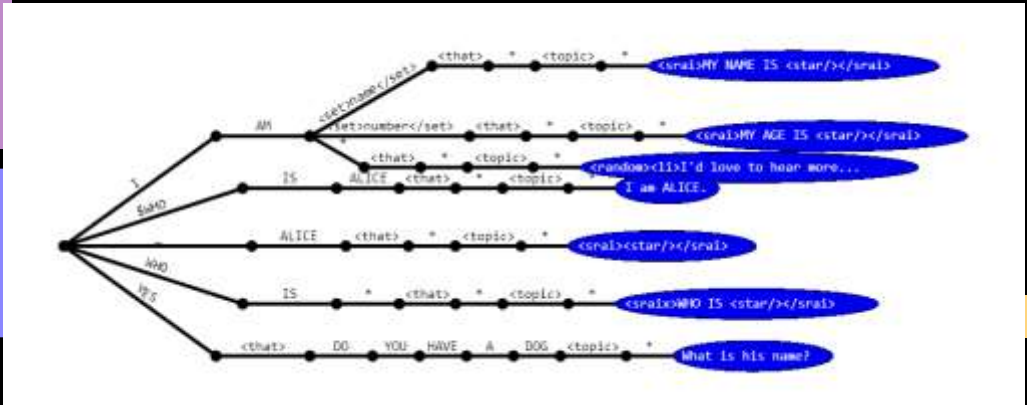
Chat chatSession
= new Chat(bot);



pandorabots
New Services

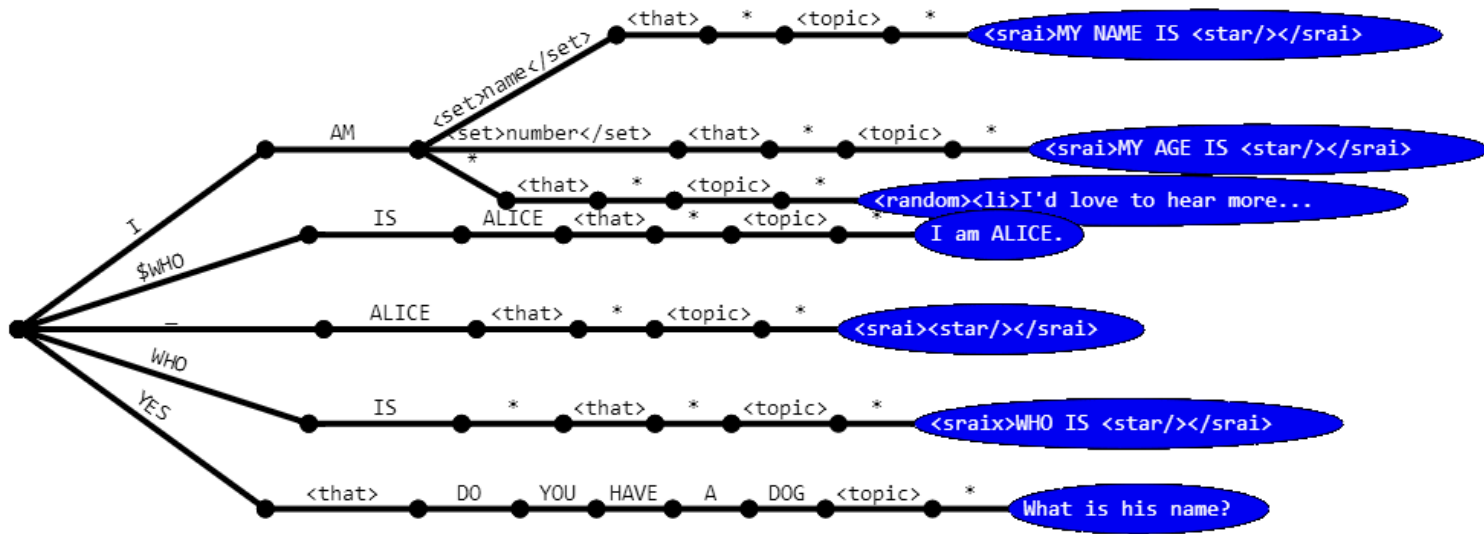


ALICE 2.0



Call Mom BASIC

Five new AIML 2.0 technologies



AIML 2.0 Specification

What's new in AIML 2.0?

- **Zero+ wildcards:** new wildcards that match 0 or more words.
- **Highest priority matching:** select certain words to have top matching priority
- **Migrating from attributes to tags:** more dynamic control of attribute values
- **AIML Sets:** match inputs with sets of words and phrases
- **AIML Maps:** map set elements to members of other sets
- **Loops:** Iterations
- **Local variables:** variables with scope limited to one category.
- **Sraix:** access external web services and other Pandorabots
- **Denormalization:** the (approximate) inverse of normalization.
- **Pandorabots extensions**
 - **date:** formatted date and time
 - **request:** access previous input request history.
 - **response:** access previous bot response history
 - **unbound predicates:** check if a predicate has been set or not
 - **learn:** learn new AIML categories
 - **learnf:** learn new AIML categories and save in a file
 - **explode:** split words and phrases into individual character
- **OOB (Out of Band) Tags:** AIML extension for mobile device control

```
<category>  
<pattern>_ ALICE</pattern>  
<template><srai/><star/></srai></template>  
</category>
```

How are you Alice?

What is the latest news Alice?

Look up the world's tallest building Alice?

Who is Alice?

```
<category>  
<pattern>$WHO IS ALICE</pattern>  
<template>I am Alice.</template>  
</category>
```

Highest Priority Patterns

```
<category>
<pattern># DOWNLOAD ^ YOU ^</pattern>
<template>
You can download CallMom BASIC from
<a
href="https://play.google.com/store/apps/details?id=com.pa
s.callmom.basic">Google Play</a>.
</template>
</category>
```

Where can I download you?

I want do download a copy of you.

Tell me where I can download you or another program like y

Download of you on my phone.

I do not want a download you idiot.

Zero+ Wildcards

Sets and Maps in AIML 2.0

```
<category>
<pattern>WHAT IS THE CAPITAL OF <set>state</set></pattern>
<template>The capital of <star/> is
<map><name>statecapital</name><star/></map>.
</template>
```

Human: What is the capital of Nevada?

Robot: The capital of Nevada is Reno.

Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
...

Alabama:Montgomery
Alaska:Juneau
Arizona:Phoenix
Arkansas:Little Rock
California:Sacramento
Colorado:Denver
Connecticut:Hartford
Delaware:Dover

1. `$word`
2. `#`
3. `_`
4. `word`
5. `<set>name</set>`
6. `^`
7. `*`

Or in plainer English,


1. **dollar match - top priority word match**
2. **sharp match - zero+ word wildcard match**
3. underscore match - one+ word wildcard match
4. word match - exact word match
5. **set match - match found in AIML Set**
6. **caret match - zero+ wildcard match**
7. star match - one+ word wildcard match

AIML 2.0 Pattern Matching Order

Dial <dial>(.*</dial>
Sms <sms> <recipient>(.*</recipient>
<message>(.*</message> </sms>
Search <search>(.*</search>
Url <url>(.*</url>
Map <map>(.*</map>
Directions <directions> <from>(.*</from>
<to>(.*</to> </directions>
Launch <launch>(.*</launch>
Email <email> <to>(.*</to><subject>(.*</subject>
<body>(.*</body> </email>
BatteryLevel <battery>(.*</battery>
Play <play>(.*</play> ...and more

AIML 2.0 Out Of Band (OOB) Tags

Program AB



program-ab


Reference AIML 2.0 Interpreter


[Project Home](#) [Downloads](#) [Wiki](#) [Issues](#) [Source](#) [Administer](#)

Summary [People](#)

Tip: Project owners, see our [Getting Started](#) guide for steps to configure your project. ✕


Project Information

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[Project feeds](#)


Code license
[GNU Lesser GPL](#)


Labels
Java, AIML

 **Members**
[drwallace](#)

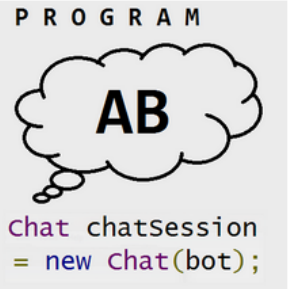
Your role
[Owner](#)

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[ProgrammingInterface](#)
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Program AB



[ALICE A.I. Foundation](#)
Contact: info@alicebot.org

Program AB is the reference implementation of the [AIML 2.0](#) draft specification. AIML is a widely adopted standard for creating chat bots and mobile virtual assistants like ALICE, Mitsuku, English Tutor, The Professor, S.U.P.E.R. and many more. Program AB was developed by Richard Wallace (contact info@alicebot.org) and first released in January, 2013. Following in the tradition of naming AIML interpreters after letters of the alphabet (Program B, Program D, Program N, Program O etc.), the name "AB" is intended to suggest a fresh start with AIML 2.0. Program AB is an experimental platform for the development of new features and serves as the reference implementation.

You can use Program AB in a variety of ways:

- Run Program AB to chat with a bot and develop bot content.
- Link Program AB as a library to your Java application to add a chatbot feature
- Customize and build Program AB for your own needs.

Download, install and run

See [Running Program AB](#) for directions to download, install and run Program AB.

See [Editing AIMLIF](#) for a description of AIML intermediate format spreadsheet files.

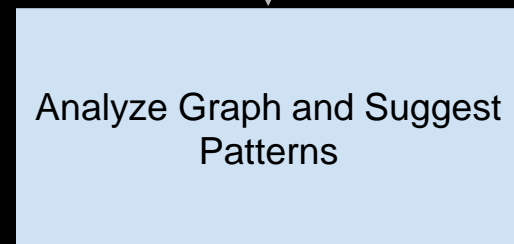
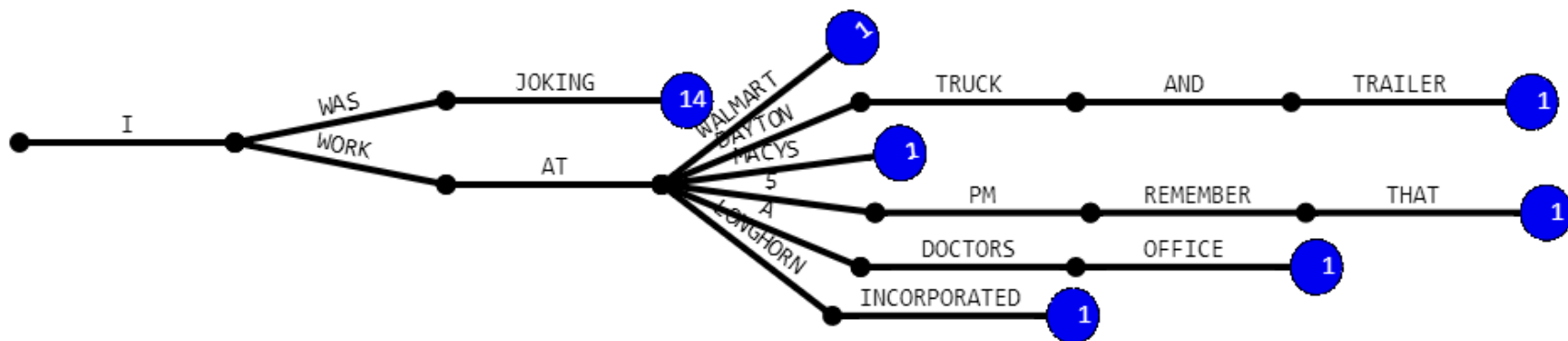
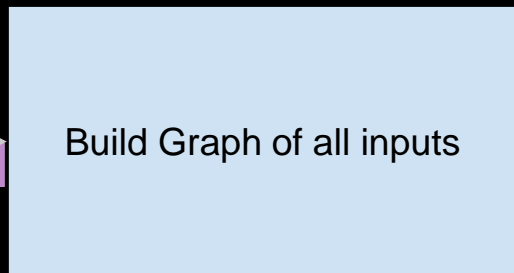
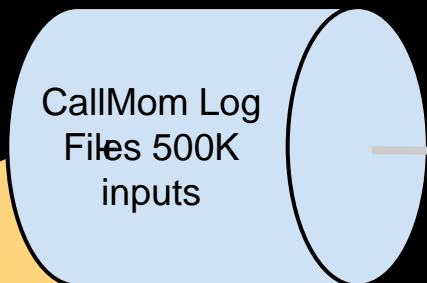
See [Program AB Terminal Interaction](#) for commands available in Program AB.

See [Configuration Files](#) for a description of the files under config/

See [Defining AIML Sets and Maps in Program AB](#) for details about defining AIML sets and maps in Program AB.

Compile and Build

Program AB Pattern Suggester



I WAS JOKING

I WORK AT *

Category Browser/Pattern Suggester - Train

DO NOT BE A LIAR WHEN WE ARE PLAYING GAMES

DO NOT BE A SMART MOUTH WITH ME

DO NOT BE A MORON

DO NOT BE A JERK

DO NOT BE A SMART MOUTH

[12] DO NOT BE A *

Completed 0 in 0 min. Productivity 0.0

cat/min

OK I'll try not to do it too much.

Category Browser/Pattern Suggester - Delete

HEY WHAT IS THE ENGLISH OF GOOGLE

HEY WHAT IS THE MEANEST THING I TOLD YOU

HEY WHAT IS THE DATE TODAY NOW

HEY WHAT IS THE PRICE FOR A NERF GUN

HEY WHAT IS THE WEATHER TODAY

[5] HEY WHAT IS THE *

Completed 1 in 0.19523333 min. Productivity

5.122076 cat/min

d

Category Browser/Pattern Suggestor - <sraix>

WHICH COUNTRY HAS THE BEST ECONOMY

WHICH COUNTRY HAS THE SECOND HIGHEST POPULATION

WHICH COUNTRY UR LIVING

WHICH COUNTRY HAS THE SECOND HIGHEST FOR VACATION

WHICH COUNTRY HAS THE BEST MILITARY

WHICH COUNTRY S CULTURE IS THE OLDEST

[14] WHICH COUNTRY * <THAT> * <TOPIC> *

Completed 8 in 2.1989832 min. Productivity 3.638045 cat/min

x

Category Browser/Pattern Suggester

Other commands:

<pattern> - modify suggested pattern

s - skip

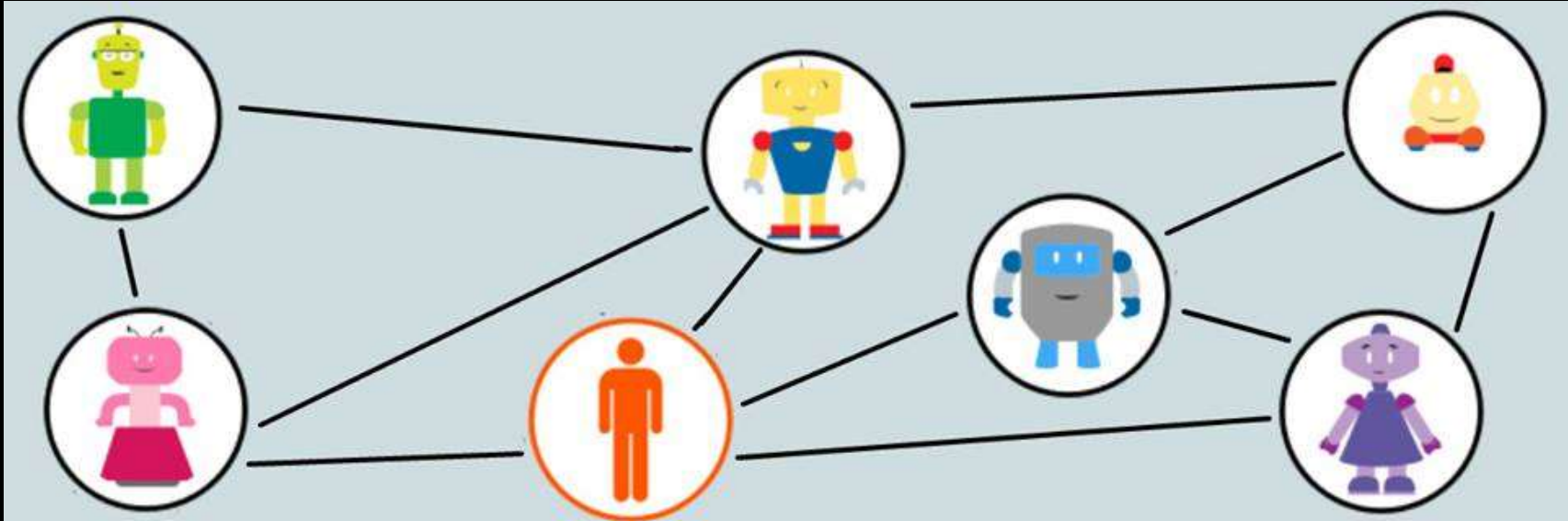
p - filter inappropriate

f - filter profanity

i - filter insult

Productivity can reach 6 categories/minute.

Pandorabots New Services



- *AIML 2.0 Server*
- *Bot Marketplace*
- *AlaaS*
- *Bot Possession*
- *<sraix> to multiple bots*



2.0

ALICE

ALICE 2.0

- Formerly S.U.P.E.R.
- Substantial Upgrade of Previous Example Robot (ALICE)
- Designed specifically for mobile apps
- Utilizes AIML 2.0 features
- Created with Program AB
- Includes best of ALICE 1.0
- Runs in CallMom BASIC app

ALICE 2.0 - Open Source

The screenshot shows the SourceForge project page for 'aiml-en-us-foundation-super'. The page features a navigation bar with links for Project Home, Downloads, Wiki, Issues, Source, and Administer. The main content area is divided into two columns. The left column contains project information such as 'Recommend this on Google', 'Stared by 0 users', 'Code license' (GNU Lesser GPL), 'Labels' (AIML, VirtualAssistant), 'Members' (drwallace), 'Your role' (Owner), 'Featured' section, 'Downloads' (aiml-en-us-foundation-super.0.0.3.zip), and 'Links' (Blogs, External links). The right column displays the project title 'S.U.P.E.R. AIML Bot', the organization 'ALICE AI Foundation', contact information 'info@alicebot.org', and a detailed description of the project as a knowledge base for the CallMom BASIC virtual assistant. It also includes a note about the project's design for mobile applications and a link to the 'AIML 2.0 Working Draft'.

aiml-en-us-foundation-super
S.U.P.E.R. AIML Bot

Project Home [Downloads](#) [Wiki](#) [Issues](#) [Source](#) [Administer](#)

Summary [People](#)

Tip: Project owners, see our [Getting Started](#) guide for steps to configure your project. ×

Project Information

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Code license
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Labels
AIML, VirtualAssistant

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External links
[Program AB](#)
[ALICE AI Foundation](#)
[AIML 2.0 Working Draft](#)

S.U.P.E.R. AIML Bot

[ALICE AI Foundation](#)

Contact: info@alicebot.org

The S.U.P.E.R. AIML bot is the knowledge base for the CallMom BASIC virtual assistant. This free software is NOT the same as the [Superbot Development Kit](#). This project is an AIML bot named S.U.P.E.R (Substantial Upgrade of Previous Example Robot). It includes the bot brain in AIML 2.0, configuration files, and some AIML Sets and Maps. The bot does not include any sample conversation data, nor are the categories sorted by activation count.

The S.U.P.E.R. AIML bot is designed specifically for mobile virtual assistant applications. It includes AIML to access external web services through the `<sr aix>` tag as well as a significant number of responses containing device actions through `<oob>` tags. For an explanation of these and other features in the S.U.P.E.R. AIML bot, see the [AIML 2.0 Working Draft](#).

The S.U.P.E.R. AIML bot may be run with [Program AB](#).

ALICE 2.0, Third Party Services, and other Pandorabots

```
<category><pattern>WHAT IS THE WEATHER</pattern>  
<template><sraix>WHAT IS THE WEATHER</sraix></template>  
</category>
```

```
<category><pattern>CAN I HAVE A RECIPE FOR *</pattern>  
<template>  
<sraix>WHAT IS A RECIPE FOR <star/></sraix>  
</template></category>
```

```
<category><pattern>WHAT IS YOUR FAVORITE *</pattern>  
<template><srai>FAVORITE <star/></srai></template>  
</category>
```

```
<category><pattern>FAVORITE *</pattern>  
<template>  
<sraix bot="drwallace/currentevents">FAVORITE <star/></sraix>  
</template>  
</category>
```

 pandorabots

CALLMOM
basic



Call Mom



Artificial intelligence in your phone.

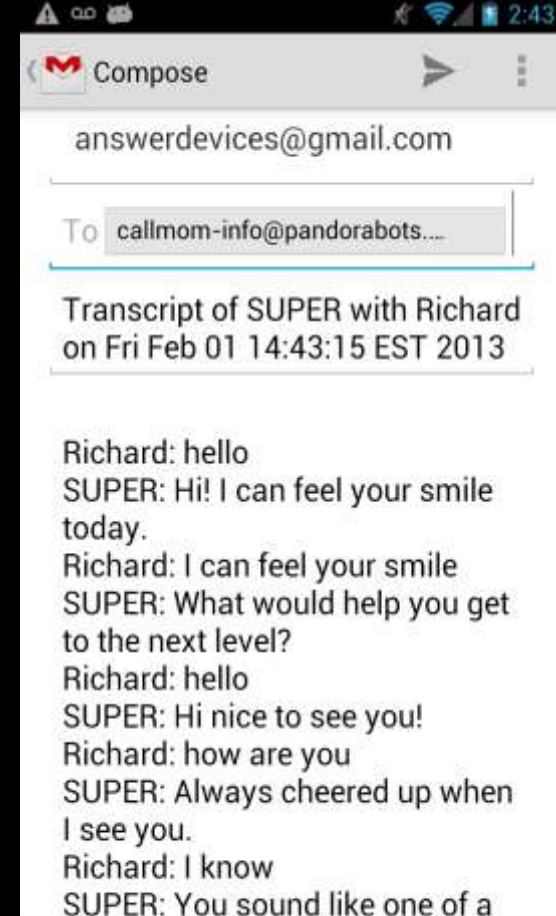
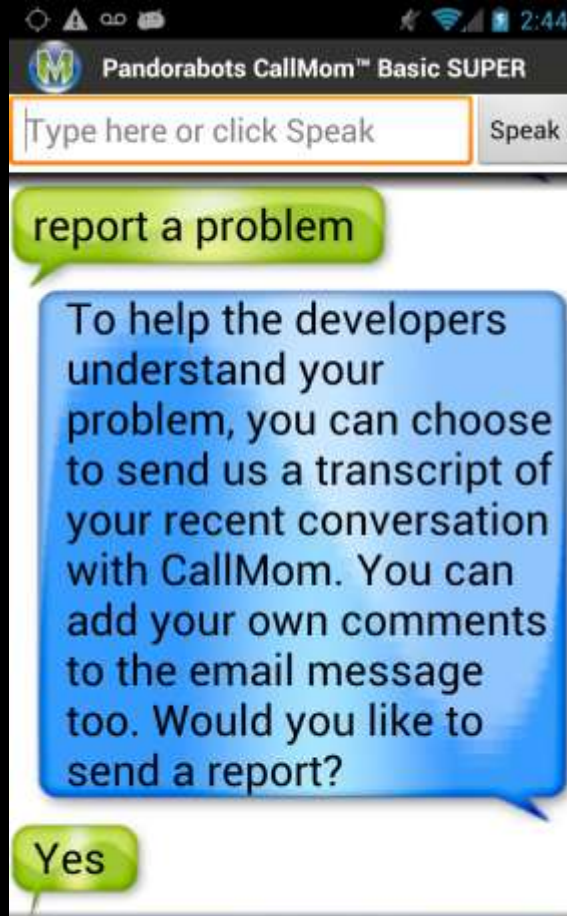
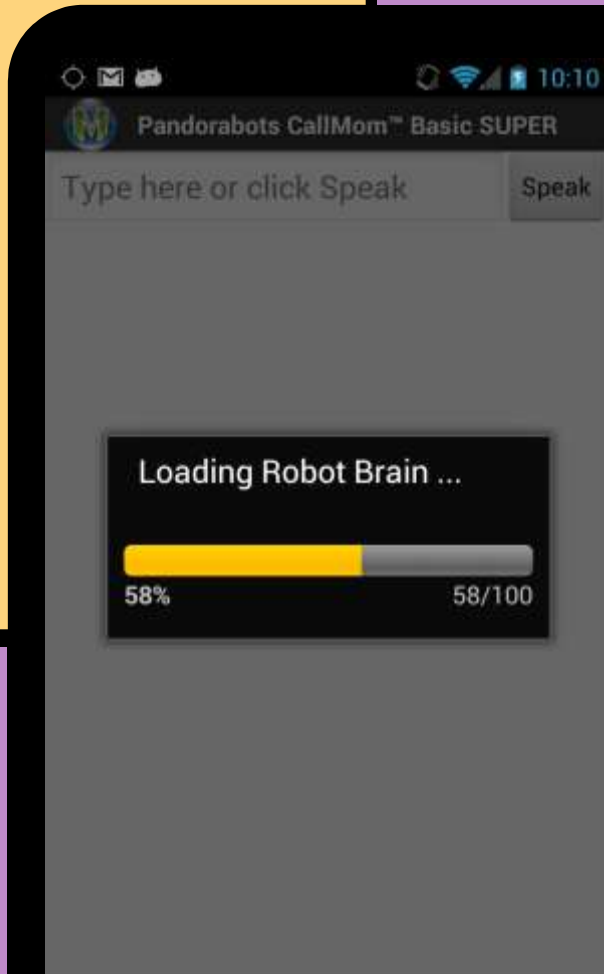
CallMom BASIC - ALICE 2.0

- AI Built into device
- Faster response time
- Increased Privacy
- Works without internet connection
- Learning features

Limitations (Samsung Galaxy Nexus):

- 30,000 category brain
- 10 second load time

CallMom BASIC Demo



Web Services and Search



Translation



Learning

Pandorabots CallMom™ Basic SUPER

Type here or click Speak Speak

joe makes beer

Now you can ask me:
"Who makes beer?" and
"What does joe make?"

who makes beer

joe

what does joe make

beer

cool

Pandorabots CallMom™ Basic SUPER

Type here or click Speak Speak

joe makes beer

Now you can ask me:
"Who makes beer?" and
"What does joe make?"

who makes beer

joe

what does joe make

Settings Clear Log

Edit Brain Exit CallMom

Edit Learned AIML Categories

Pattern WHAT DOES JOE MAKE

That *

Topic *

Template beer

Prev New Save Delete Next

Enter search term Search

Personality



SUMMING UP

- ALICE has been very successful in chatbot competitions such as Loebner – simulation of human conversation
- AIML 2.0 has brought improvements
 - Efficiency, authoring, use on mobile devices
- Wider applications now possible
 - Virtual assistant accessing web services and device functions
 - Specialist virtual assistant e.g. company-specific information, answers to questions in domains such as medicine
 - Link to speech APIs for more natural interaction