# Einstein Robot

## Limited functionality out of box without web connectivity

## The toy will give audible instructions once powered on. After an initial greeting is played. A short audio tutorial is given on how to use a smart device to set up and register the toy via the Wi-Fi and cloud service.

## Smart Device is coupled to the toy to allow the consumer to do the normal set up and customization with the smart device screen and input method

## All of user’s information is input via a smart device such as a mobile phone, tablet, pc, etc.

## These smart devices must have the ability to connect to the Internet and an Internet connection is available during the set up process.

## The mobile device must have access to the same local router the toy will be attached to through its Wi-Fi connection in the home

# Smart Device

## IOS support

## Android Support

# Features

## Registration process of user account

### Name

### Birthdate

### Nick Name

### Food favorites check list

### Holiday check list

### Hobby check list

### Interests check list

### Color preferences

### Pets preference

### Location for events, weather, time zone, etc.

### Cross calendar set up

### Alert/notifications set up

### Content restriction set up

### Photo capture for storage

### Speech capture for storage

# Process Smart device

## Download robot set up to smart device from store

## Initial app configuration and set up on smart device

## Instructions for powering on robot

## Video on smart device to show robot battery charge, turn on and initialization

## Smart device to search out robot id

## Prompt user to assure correct pairing of robot to smart device

## Down load to robot over Wi-Fi all set up information including Wi-Fi information set up

## Camera set up using smart device as display

## Microphone set up using smart device as feedback device

## Robot sensor and power management verification and set up

## Robot diagnostics for all motors and feed back loops

# Through a series of well scripted interaction sessions both verbal and smart device based or a combination of verbal response with smart device visual prompts

## Scripted dialogs help the toy collect data from the user to help better interface with the user

## Scripted dialogs help determine the consumers likes and needs, so the toy pre focuses information on those subjects

## Toy has capacity for learning personal preferences such as sports the consumer is interested, gamming, food, holidays, etc.

## Calendar of life events (birthdays, holidays celebrated, family members, pets) and daily events (exams, doctor appointments, dinners, reminders) can be created on line or imported from one of the popular calendar application tools

## Feature functions

### Entertain Brain Games

#### Games designed to help you improve you

#### Concentration

#### Thinking speed accuracy

#### Memory

#### Problem solving

#### How solve math problems

#### Learn new skills

## Learn how to program

### Learn a basic programming language and teach Einstein and his friends new behaviors

### Learn to think object oriented

### Programming in kid friendly bubbles

## Explore and learn about science

### Ecology

### The earth

### The Universe

### The Oceans

### Gravity

### The water cycle from sky through the earth

### The human heart

### Other Cool interesting facts

## This day in history

### How many people are in the world

### Great inventions

### How much food gets eaten every day

### Why the oceans are tied to the earth’s orbit

### Why do we taste sweet, salty, bitter and spicy things

## How do things work

### Cars

### Phones

### Computers

### Wireless mouse

### Television

### Computers

### Ovens conventional versus microwave

# Chatting with Einstein (chat bot based, but with Einstein’s type answers.

### Dialog generalized chat for entertainment utilizing Einstein’s real quotes from time to time with the generalized chat bot response

# What to do today that’s interesting, fun interesting things to do

### Visit a museum (can be virtual through the tablet with Einstein being the guide)

### Do a science experiment (Mentos and coke volcano)

### Cook new food like pizza

### Learn about plants, from seed to vegetable

# Help me find

## A basic natural language query tool to help you find the basic things that can be displayed on your smart device while Einstein speaks to the smart device video

### Such as help me find where China is

### How big is America

### A DE loran

### Where do penguins come from

# Food

### Where to get great pizza

### How to make ice cream

### How to get a machine to make ice cream

### What’s in cheese, how is it made, where can I buy it

# Clothes

### Where can I buy a kilt

### Einstein T shirt

### Most comfortable shoes in the world

### Nike Shoes

# A place

### Where is Hawaii and how can I get there

### Where is Shangri-La

### Alaska

### Fuji

# Power Management

## The Robot will come with an internal rechargeable battery. The battery can be replaced

## The internal rechargeable battery will come with an initial charge of 60 percent power

## This will allow for the toy to function immediately out of the box

## The Robot will have a mini usb connector in the back to allow for software updating and power recharging

## If possible the robot may have conductive coils placed in each foot.

## Once the robot needs to be recharged it can walk up to a stand and locate itself in the prober position where the inclusive coils in the feet can receive and induced field from the platform the robot is standing on the recharge the battery

## The size of the battery interims of milliamps per hour and physical battery weight and size TBD

## Run time and battery cost TBD

## WIFI usage, motor current draw and camera usage can all greatly effect battery consumption and life expectancy

## Charging time can be better estimated once the battery is chosen based on targeted run time per session prior to charging

# Web connected toy

## Has integrated Wi-Fi Initial objectives below

### Must be a total solution (IC + Core APP + Cloud) due to time to market if at all possible

### Easy Wi-Fi setup & Easy Firmware upgrade a must

### Easy push messages to smart devices Easy development SDK must be ready

### Fast boot (RTOS, < 1sec)

### Low power consumption (Battery)

### Advance encryption (RSA/AES

### High Speed Mode

#### High Performance: 150mW

#### CPU 80MHz

#### Full function allowing for data intensive applications and data transfer such as images, sound files, etc.

### Low Power Mode

#### Lower Power consumption: 30mW

#### CPU 12MHz

#### I/O service remaining such as SAR-ADC, I2C, UART, SPI and GPIO Still allowing for external communication and control of devices such as motors and sensors

### Deep Power down mode for maximum power conservation

#### Real Time Clock consumes small amount of power around 10uA

#### Alarm, Wake-up function

### Currently imbedded Wi-Fi modules are about 8 to 12 times more efficient between boot time, power consumption, set up time efficient then open source, lynx type.

# Speaker

## Speaker can be used for audio playback as well as high frequency tone emission.

## Size TBD

## Quality TBD

## Max DB output TBD

## DB adjustment

## Speaker to be located inside plastic housing with the figure wearing soft clothes in the front of the speaker, so final level must take these points of DB reduction into account

## Must be able to pass the age graded safety values for DB out as defined by the ASTM, EN71 if sold as a toy. In some cases this is retailer dictated by isle space. If sold direct as a computer connected peripheral, max DB level compliance rules do not apply without a child age grading.

## Some retailers may require a maximum DB level to be factory preset for insurance regulations

# Microphone

## Sensitivity TBD

## Dynamic range TBD

## Noise cancellation TBD

## Omni directional TBD

## Estimated optimal operating range to be one to two meters

## Solid State versus high quality condenser microphone analysis for cost benefit analysis

# Low resolution camera

## Camera resolution TBD

### 3 Meg Pixel or higher

### Jpeg or qvga conversion on board if possible

### Camera back light needed

## Camera Lens TBD

### Camera filter TBD

### Fixed focal point TBD

### Lens angle TBD

### Integrated infrared filter to minimize high sunlight levels, ant glare coated.

# Two infrared blasters

## Capable of receiving infrared signals and decoding them

## Capable of transmitting infrared signals

## Capable of being used as a tracking device to help track an object with in its visual range of one to two meters

## Capable of controlling other toys, of me /R AV equipment such as television and cable box.

## Capable of receiving control codes from other toys or devices

## These are low speed communication ports

# Animated face with 5 motors

## Capable of at least 8 to 10 facial emotions

### Eyes turn left and right

### Eye lids open and close

### Face smile

### Face frown

### Face neutral

### Eye brow raised

### Head turn 15 degrees when eyes exceed 20 deg of extreme movement, left or right from center

### Flexibility to extend tongue when mouth fully opened.

# Walking capabilities

### Left (20 degree increments per turn)

### Right (20 degree increments per turn)

### Forward straight

### Backwards straight (not recommended)

### Important edge/collision detection

#### Collision or table edge detection is necessary to prevent damage

#### Collision detection can be derived from

##### Camera, if object height is within camera focus

##### Motor current rise/ stall

##### Accelerometer feedback

#### If both forward and reverse walking is allowed then double set of sensors are needed

#### Suggest only forward walking

## Detection Methods

### Edge detection can be accomplished with

### Switch in front of leading walking foot

### Infrared reflected light sensor in chest is possible, clear glass table top issue

### Camera not feasible to use due focus height and room light conditions

## Text to speech

### Evaluation of cost and performance of the open source and fee based text to speech engines with the ability to support an Einstein type voice

### Open source alternatives

### License Alternatives

### Customization evaluation

### Internal and external evaluation of resources

## Speech to text

### Web based / cloud

#### Evaluation of cost and performance of the open source and fee based speech to text engines with the ability to support a wide variety of languages and dialect versions

#### Open source alternatives

#### License Alternatives

#### Customization evaluation

#### Internal and external evaluation of resources

### Option of using local smart device for conversion

### Local smart device will need Internet connection

## Stored speech

### Creation of stored speech with in the robot toy from prompts

### User set up

### Power management

### 365 days of facts

### 365 days of jokes

### Cover speech during connectivity issues

### Etc.

## Einstein phoneme set

### The purchase and or creation of a phoneme set to be used to closely resemble what we believe to be an endearing version of Einstein’s voice.

### This must be able to be ported to phrase engine for inflection and word substitution, so the speech sounds like it was from a warm and friendly Einstein

## Personality processing module

### Always make sure the robot speaks with warm friendly tone, easy to understand. At times upbeat and funny

### With a small amount of making fun of himself, I am like everyone else, I still go to the toilet a few times a day

## Idle loop procedures

### Prompts Idle loop for no user activity, interact or sleep

### Prompts Idle loop for web connectivity

### Sleep timer Idle loop for set times and prompts

### Idle loop face emotions

### Charging session loop

### Web connection speed downgrading

## Joke telling 365 pre-loaded

### Scripted jokes in general humor about the earth, science, and math. Easy to understand and somewhat clever with a double meaning at times

### Or, it’s not being one of the smartest men on earth, I can never get a break, even my wife asks me to fix the phone.

## Fun science facts 365 loaded

## Fail and soft fail paths and operations

## Consumer interaction building over time to reveal new features and abilities to connect the user on even an more emotional level

## Second Screen connectivity

## Natural language processing for command

## Natural language processing for query