RepRap Developer Audience Analysis

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Abstract

The purpose of this research is to investigate and report the demographics and user needs of the average RepRap user. This data will help anyone planning to design documentation materials to guide RepRap activities. A request for survey participants was presented in the social networking website Google+ and in the RepRap IRC channel. Eleven participants responded. Users were overwhelmingly male, in their 20s or 30s, and in computer science or engineering fields. They were a diverse group, operating or assembling a variety of RepRaps and software. Five personal interviews were conducted. Users responded enthusiastically to the idea of more documentation. Most users use wikis and user chat rooms regularly for assistance with their problems.

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Introduction

RepRap users do a lot of their communication with each other online in IRC chat rooms and social networking. This is great for the researcher who is researching the needs of RepRap users. The IRC chat room keeps logs available online. These logs are filled with questions, answers, and user data. The RepRap subreddit is another good resource. The benefit of /r/RepRap over the IRC logs is that often the questions are the subject of the post, rather than hidden within more general communication.

This research was conducted in two parts. The initial user analysis was a 14 question survey which was given to eleven users from the RepRap IRC chat room and the Google+ social network. The second part consisted of five interviews using Google Hangouts. The first seven questions were about user demographics. The second seven were about which RepRap the user was developing, what documentation they prefer to consult, and which software tools they use to operate it.

Materials and Methods

A request for survey participants was presented in the social networking website Google+ and in the RepRap IRC channel. Eleven participants responded.

Five personal web chat interviews were conducted with users using the Google Hangouts feature on Google+.

Results

Demographics

The demographics revealed that all respondents were cisgender males. Most were 22-34 years old, none were older than 45. One user was 21 or younger, two users were 35-44 years old. Education level seemed reflective of the age group with most users either having had some undergraduate educated or completed their degree. All had completed high school, and a couple users had some post-graduate education. Most users were in Computer Science/IT fields. Only one user was employed in science, the other rest were either students or employees in engineering.

Graph User Ages

Graph User Education

Application

Graph When users consult documentation

Analysis

Appendices

Survey

Demographics

1. Age Range
[ ] 21 and Under
[ ] 22 to 34
[ ] 35 to 44
[ ] 45 to 54
[ ] 55 to 64
[ ] 65 and Over
[ ] Decline

2. Sex
[ ] Male
[ ] Female
[ ] Decline

   Gender (if different)
[ ] Male
[ ] Female
[ ] Decline

3. Education level
[ ] Some high school
[ ] Completed high school
[ ] Some undergraduate
[ ] Completed undergraduate
[ ] Some postgraduate
[ ] Completed post graduate

4. Employment Status
[ ] Employed for wages
[ ] Self-employed
[ ] Out of work and looking for work
[ ] Out of work but not currently looking for work
[ ] A homemaker
[ ] A student
[ ] Retired
[ ] Unable to work

5. Employment Type
[ ] Engineering
[ ] Performance arts

[ ] Science/Research
[ ] Office work
[ ] Computer science/IT
[ ] Fast food/barista
[ ] Education
[ ] Retail
[ ] Student studying B.S./B.A. in _____
[ ] Other _____
[ ] N/A
6. Where are you in the RepRap process?
[ ] Researching RepRap
[ ] Assembling RepRap
[ ] Purchased pre-built RepRap
[ ] Operating RepRap

7. What kind of RepRap will you likely be working with?
[ ] Darwin
[ ] Prusa
[ ] Mendel
[ ] Huxley
[ ] Custom
[ ] Other _____

App questions

1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[ ]   Locating parts
[ ]   Building electronics
[ ]   Operating software
[ ]   Building the RepRap
[ ]   Building the extruder
[ ]   Assembling the hotbed
[ ]   Troubleshooting

2. Where do you go first when you have a problem?
[ ] Wiki
[ ] Instructions included with parts (by manufacturer)
[ ] Blogs
[ ] Website
[ ] User forums
[ ] User chat rooms
[ ] Social networking
[ ] Local hacker group
[ ] Friend/Adviser
[ ] I am a rock, I am an island

4. If unresolved, where would you go second when you have a problem?
[ ] Wiki
[ ] Instructions included with parts (by manufacturer)
[ ] Blogs
[ ] Website
[ ] User forums
[ ] User chatrooms
[ ] Social networking
[ ] Local hacker group
[ ] Friend/Adviser
[ ] I am a rock, I am an island.

5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
_____ [ ] I don't know

6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
_____ [ ] I don't know

7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)

8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
_____ [ ] I don't know

9. What kind of electronics will you use? (RAMPS/Generation x./etc)
_____ [ ] I don't know

Raw Data

USER 1
1. Age Range
 [x] 22 to 34

2. Sex
[x] Male

3. Education level
[x] Completed post graduate

4. Employment Status
[x] Employed for wages

5. Employment Type
 [x] Science/Research
 [x] Computer science/IT

6. Where are you in the RepRap process?
[x] Operating RepRap

7. What kind of RepRap will you likely be working with?
[x] Prusa

1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[x] Locating parts
[x] Building electronics
[x] Building the RepRap
[x] Building the extruder
[x] Assembling the hotbed
[x] Troubleshooting

2. Where do you go first when you have a problem?
[x] Wiki

4. If unresolved, where would you go second when you have a problem?
[1] Blogs
[2] User forums
[3] User chatrooms

5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
_____Sanguinololu with Atmega644p and A4988 stepsticks

6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
____Blender & google cad,

7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)

slic3r

8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
____Sprinter for now, will move to marlin in future [ ] I don't know

9. What kind of electronics will you use? (RAMPS/Generation x./etc)
___Sanguinololu_ [ ] I don't know

USER 2

Demographics
1. Age Range
[X] 21 and Under
2. Sex
[X] Male
3. Education level
[X] Some undergraduate
4. Employment Status
[X] A student
5. Employment Type
[X] Student studying B.S./B.A. in _____Engineering_____
6. Where are you in the RepRap process?
[X] Operating RepRap
7. What kind of RepRap will you likely be working with?
[X] Other   __I have 2 prusa2s_____
1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[X] Building the extruder
[X] Troubleshooting
2. Where do you go first when you have a problem?
[X] User chat rooms
4. If unresolved, where would you go second when you have a problem?
[X] Wiki
5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
_____arduino mega 2560
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
____openscad
7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc) slic3r
8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
_____sprinter/marlin
9. What kind of electronics will you use? (RAMPS/Generation x./etc)
____ramps

User Research Report

USER 3

1. Age Range
   [X] 22 to 34
   2. Sex
   [X] Male
   Gender (if different)
   [X] Male
   3. Education level
   [X] Some undergraduate
   4. Employment Status
   [X] Employed for wages
   5. Employment Type
   [X] Computer science/IT
   6. Where are you in the RepRap process?
   [X] Assembling RepRap
   7. What kind of RepRap will you likely be working with?
   [X] Prusa
   1. What are you likely to consult documentation about when operating your RepRap?
   Choose all that apply:
   [x] Locating parts
   [x] Building electronics
   [x] Building the RepRap
   [x] Building the extruder
   [x] Troubleshooting
   2. Where do you go first when you have a problem?
   [x] Wiki
   4. If unresolved, where would you go second when you have a problem?
   [x] User chatrooms
   5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
   _arduino mega
   6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
   _google sketchup
   7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
   Skeinforge? Not sure
   8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
   _Marlin
   9. What kind of electronics will you use? (RAMPS/Generation x./etc)
   _RAMPS 1.2

USER 4

1. 22 to 34
2. Male
3. Completed undergraduate
4.Employed for wages
5. Science/Research+Office work+Computer science/IT
6.All of the above
7. Prusa+Mendel+Huxley+Custom(multiple)
=====
1.Locating parts+Troubleshooting
2.User chat rooms
3.Local hacker group
5. Arduino, sam3u, random custom stuff
6. Mostly OpenSCAD
7. Slic3r
8. Sprinter
9. I've used everything on the market so far with few exceptions

USER 5

1. Age Range

 [x] 22 to 34

2. Sex

[x] Male

3. Education level

 [x] Completed undergraduate

4. Employment Status

[x] Employed for wages

5. Employment Type

[x] Engineering

6. Where are you in the RepRap process?

 [x] Operating RepRap

7. What kind of RepRap will you likely be working with?

 [x] Mendel

1. What are you likely to consult documentation about when operating your RepRap?

Choose all that apply:

[x] Locating parts

[x] Building electronics

[x] Operating software

[x] Building the RepRap

[x] Building the extruder

[x] Assembling the hotbed

[x] Troubleshooting

2. Where do you go first when you have a problem?

 [x] User chat rooms

4. If unresolved, where would you go second when you have a problem?

 [x] Blogs

5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)

Arduino

6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)

Solidworks, OpenSCAD, Inventor

7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)

Slic3r, Skeinforge, Printrun

8. What kind of Firmware will you use? (Teacup/Sprinter/etc)

Marlin

9. What kind of electronics will you use? (RAMPS/Generation x./etc)

GEN6 Electronics

USER 6
1. Age Range
[x] 35 to 44
2. Sex
[x] Male
3. Education level
[x] Completed undergraduate
4. Employment Status
[x] Employed for wages
5. Employment Type
[x] Science/Research
6. Where are you in the RepRap process?
[x] Operating RepRap
7. What kind of RepRap will you likely be working with?
[x] Huxley
[x] Custom
1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[x] Locating parts
[x] Building electronics
[x] Operating software
[x] Building the RepRap
[x] Building the extruder
[x] Troubleshooting
2. Where do you go first when you have a problem?
[x] Wiki
4. If unresolved, where would you go second when you have a problem?
[x] Blogs
5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
_Arduino
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
__OpenScad and Blender
7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
Skeinforge, Slic3r, Pronterface
8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
Teacup/Marlin
9. What kind of electronics will you use? (RAMPS/Generation x./etc)
Gen7, Sanguinololu

USER 7
> 1. Age Range
> [X] 22 to 34
> 2. Sex
> [X] Male
> 3. Education level
> [X] Some postgraduate
> 4. Employment Status
> [X] Self-employed
> 5. Employment Type
> [X] Computer science/IT
> 6. Where are you in the RepRap process?
> [X] Researching RepRap
> 7. What kind of RepRap will you likely be working with?
> [X] Mendel
> 1. What are you likely to consult documentation about when operating your RepRap?
> Choose all that apply:
> [X] Locating parts
> [X] Building electronics
> [X] Operating software
> [X] Building the RepRap
> [X] Building the extruder
> [X] Assembling the hotbed
> [X] Troubleshooting
> 2. Where do you go first when you have a problem?
> [X] Blogs
> 4. If unresolved, where would you go second when you have a problem?
> [X] Website
> 5. What kind of micro controller will you use? (Arduino/Boarduino, etc)
> _Arduino
> 6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
> _This is where I'm stuck right now. NOT AutoCAD/anything proprietary. looking into blender
> 7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc) not sure. see above.
> 8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
Teacup first.
> 9. What kind of electronics will you use? (RAMPS/Generation x./etc)
> RAMPS_____

USER 8
1. Age Range
[X] 22 to 34
2. Sex
[X] Male
3. Education level
[X] Completed undergraduate
4. Employment Status
[X] Employed for wages
5. Employment Type
[X] Computer science/IT

6. Where are you in the RepRap process?
[X] Assembling RepRap (plus I have a working MakerBot CupCake)
7. What kind of RepRap will you likely be working with?
[X] Prusa
1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[X] Locating parts
[X] Building electronics
[X] Operating software
[X] Building the RepRap
[X] Building the extruder
[X] Assembling the hotbed
[X] Troubleshooting
2. Where do you go first when you have a problem?
[X] Wiki
4. If unresolved, where would you go second when you have a problem?
[X] User chatrooms
5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
Arduino
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
OpenSCAD__
7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
Slic3r or SFACT
8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
Sprinter or Marlin_
9. What kind of electronics will you use? (RAMPS/Generation x./etc)
RAMPS___

USER 9
 [X] 35 to 44
2. Sex
[X] Male
3. Education level
 [X] Some undergraduate
4. Employment Status
[X] Employed for wages
5. Employment Type
 [X] Computer science/IT
6. Where are you in the RepRap process?
 [X] Assembling RepRap
Missing an option here: I am actually
[X] Purchased kit RepRap awaiting delivery
7. What kind of RepRap will you likely be working with?
 [X] Other Printrbot_____
App questions
1. What are you likely to consult documentation about when operating your RepRap
?
Choose all that apply:
[X] Locating parts
[X] Building electronics
[X] Operating software
[X] Building the RepRap
[X] Building the extruder
[X] Assembling the hotbed
[X] Troubleshooting
2. Where do you go first when you have a problem?
[X] Wiki
4. If unresolved, where would you go second when you have a problem?
[X] User forums
5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
Printrboard (TeenySLU-based)
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
OpenSCAD & variants, SketchUp, Blender
7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
Skeinforge, Slic3r
8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
_____ [X] I don't know
9. What kind of electronics will you use? (RAMPS/Generation x./etc)
Printrboard___

User 10
1. Age Range
 [x] 22 to 34
2. Sex
[x] Male
3. Education level
 [x] Completed high school
4. Employment Status
[x] Employed for wages
5. Employment Type
 [x] Computer science/IT
6. Where are you in the RepRap process?
[x] Researching RepRap
7. What kind of RepRap will you likely be working with?
 [x] Custom
1. What are you likely to consult documentation about when operating your RepRap?
[x] Building the RepRap
2. Where do you go first when you have a problem?
[x] Wiki
4. If unresolved, where would you go second when you have a problem?
 [x] User forums
5. What kind of micro controller will you use? (Arduino/Boarduino, etc)
 [x] I don't know
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
Blender
7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
RepRap
8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
the one with the most help and support
[x] I don't know
9. What kind of electronics will you use? (RAMPS/Generation x./etc)
 [x] I don't know
User 11
1. Age Range
[X] 22 to 34
2. Sex
[X] Male
3. Education level
[X] Completed undergraduate
4. Employment Status
[X] Employed for wages
5. Employment Type
[X] Engineering
6. Where are you in the RepRap process?
[X] Operating RepRap

7. What kind of RepRap will you likely be working with?
[X] Custom
1. What are you likely to consult documentation about when operating your RepRap?
Choose all that apply:
[X] Operating software
[X] Troubleshooting
2. Where do you go first when you have a problem?
[X] User chat rooms
4. If unresolved, where would you go second when you have a problem?
[X] Wiki
5. What kind of microcontroller will you use? (Arduino/Boarduino, etc)
Arduino 1280_____   [ ] I don't know
6. What kind of CAD tool will you use? (Autocad/KiCad/Blender/etc)
Autodesk Inventor_____   [ ] I don't know

7. What kind of CAM tool will you use? (Skeinforge/RepRap/etc)
Slic3r_____   [ ] I don't know

8. What kind of Firmware will you use? (Teacup/Sprinter/etc)
Marlin_____   [ ] I don't know

9. What kind of electronics will you use? (RAMPS/Generation x./etc)
Ramps 1.3_____   [ ] I don't know