

TechCast Article Series

Public Attitudes to Androids: Robot Gender, Tasks, & Pricing

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Science fiction writers and Hollywood have exposed us to the idea of androids, robots and super-intelligent systems for well over fifty years. A "robot" is a mechanical apparatus that is capable of performing human tasks, but an "android" goes a step further. It is a robot that looks and acts like a human being, a synthetic person.

Currently there are hundreds of universities, corporations and private parties engaged in the development of successful androids, destined to become one of the greatest industries in the 21st century. Those first to market with an affordable android will likely reap huge rewards. The android industry is likely to spawn jobs across many functional areas and could one day be as large as the automotive industry.

Current State of Technology

In 1973, Waseda University in Japan built WABOT-1, the first full-scale anthropomorphic robot in the world. WABOT-1 was able to walk, grasp and

transport objects, measure distances, and communicate in Japanese. In 2000 Volkswagon developed Klaus, a robot that successfully passed a driving test. Honda has been developing a humanoid robot since 1986 and recently released its latest model, "Advanced Step in Innovation Mobility" (ASIMO). At four feet tall and 115 pounds in weight, ASIMO can interpret postures and gestures, greet approaching people, follow them, move in any direction indicated, distinguish sounds and recognize faces and address pre-registered people by name. Twenty-six servomotors provide ASIMO with 26 degrees of freedom allowing it to smoothly change direction, turn, walk up and down stairs, as well as walk on uneven surfaces without pausing.

Entrepreneurs are building multi-language speech synthesizers, electronic noses, taste sensors, global positioning systems, color binocular vision, muscle mechanisms, and other robotic components. Advances in plastics, silicone and other materials are being tested for composites and durability for synthetic, ears, noses, eyes, lips, and

essentially every other facial and body component.

One such currently available technology is the full-sized animatronic head by David Ng. The advanced kit currently selling for \$1,795 comes complete with: Plexiglas skull, silicone skin, Plexiglas display stand, 16 servo motors, 2 Scott Edwards servo controllers, VSO servo controller software, and wig (choice of color & style). The eyes can move left and right; eyelids can open and close; the mouth can open & close smile, frown, lift eyebrows, and make an "O" with lips, and the entire head can turn right or left.

It is easy to extrapolate to the conclusion in a short matter of time these technologies will culminate into commercially sold human-like androids.

Research Method

A study was conducted using scanning and surveys to determine the public's attitudes to androids.

The Internet hosts ample background material on current robotic trends. Some of the more useful sites are "Android World,"¹ "Honda's ASIMO Site,"² and "The World's Greatest Android Projects."³ According to Android World, "there are 53 major android projects around the world - 27 are in Japan, 8 in the US, 4 in Germany, 4 in Korea, 3 in China, 2 in the UK, 2 in Sweden, 1 in Australia, 1 in Thailand, and 1 in Singapore." Honda Corporation is the leader in commercial android research projects. In addition to ASIMO, they have also developed the P2 Humanoid. ASIMO is widely considered

the best attempt at a commercial android, but Honda has no plans to introduce ASIMO for sale or lease.

A survey was distributed to a random sample of individuals in order to assess attitudes and the commercial viability of androids. Respondents indicated their preferences for android household tasks, cost, and design issues. In addition, respondents were asked to estimate when androids would be available for widespread commercial and household purchase. Lastly, the survey requested that each respondent list and rank concerns or factors that would influence the purchase decision.

Consumer Attitudes

On average, the respondents thought android technology would be ready for commercial use at about 2015. The tables below in Figure 1 show preferences for size, voice, and shape. The majority of responses indicate a preference for medium size, female voice, and human shaped android.

Figure 1 Consumer Preferences

SIZE

Medium	65%
Small	29%
Large	0%
No Preference	6%

SHAPE

Human	47%
Robot	18%
N/A	35%

¹ <http://www.androidworld.com/>

² <http://www.honda.co.jp/ASIMO/>

³ <http://www.androidworld.com/prod01.htm>

VOICE

Male	24%
Female	47%
No Preference	29%

When separating the men from the women's responses, both sexes prefer the android take a female form, and both sexes prefer a medium sized android. Figure 2 displays the preferences for men versus women.

Figure 2 – Men's vs Women's Preferences

	Men	Women
Female Shape	50%	60%
Male Shape	8%	0%
Large Size	0	0
Medium Size	58%	80%
Small Size	33%	20%

Figure 3 displays a summary of the preferences for android duties. The overall rating is based on a scale of one (low) to ten (high) for the preference of each android service. Housecleaning was by far the most popular android chore with a 9.1 out of 10 rating, and Baby sitting the least popular.

Figure 3 – Duties

Housecleaning	9.1
Laundry	7.0
Cooking	4.3
Baby Sitting	1.4
Washing Dishes	5.4
Mowing Lawn	6.6
Miscellaneous	4.5

Figure 4 below shows that, for overall prices of an android, women would pay \$1,700 more than men.

Figure 4 – Android Prices

Women	\$2,709
Men	\$1,009

We also learned that consumers are interested in flexible payment options. Some preferred to purchase androids outright, but most wanted to pay on a weekly or as-needed basis, and some wanted to lease.

Respondents wrote in several other tasks. Several wanted to use androids for home security. Others kept away from uses like babysitting and security that require trust to focus instead more labor-intensive tasks such as farm chores, vehicle maintenance, washing cars, and ironing.

Figure 5 indicates that individuals were mostly concerned with cost and safety. Design and maintenance were not considered too important, but some were concerned about programming, insurance, and simplification.

Fig 5 - Importance Ratings

Safety	8.7
Design	4.7
Cost	8.8
Other	4.0

Conclusions

Results suggest that the American public is willing to invest moderate sums in robots/androids for simple domestic

purposes. A good example is the Roomba by iRobot. This intelligent vacuum cleans floors, navigates around objects, is small, easy to operate, and affordable (\$199 USD). The product frees people of a time-consuming, mundane task in a convenient, cost effective way. Our data suggest that people would like robots to handle more complex household tasks, but cost and safety issues must be addressed.

Android service companies could target specific customer bases with different types of androids. Our survey suggests that women would pay a premium for android services and would prefer the android to be in female form and medium-sized. They also would like the robot to do housecleaning, dishes, lawn mowing, and simple maintenance. Meanwhile, men would also like a female android but would like it to do laundry, farm work, and car maintenance.