

Portfolio

Ruiyi Zhou

Content

Personal Website Design 1

Usability Study of QQ Browser (based on Android)3

Bookmark Redesign for QQ Browser (based on Android).....4

QR Code Scanning for QQ Browser (based on Android)6

Website Security Check for QQ Browser (based on Android)9

Users Feedback and Loyalty Cultivation 10

The Design of a Robot for a Nuclear Power Plant 12

Personal Website Design

Duration: September 2013 – Current

Website: ruiyizhou.me

Project Description:

Design my own personal website. The current version of my personal website is consisted of three tabs, homepage, portfolio, and CV.

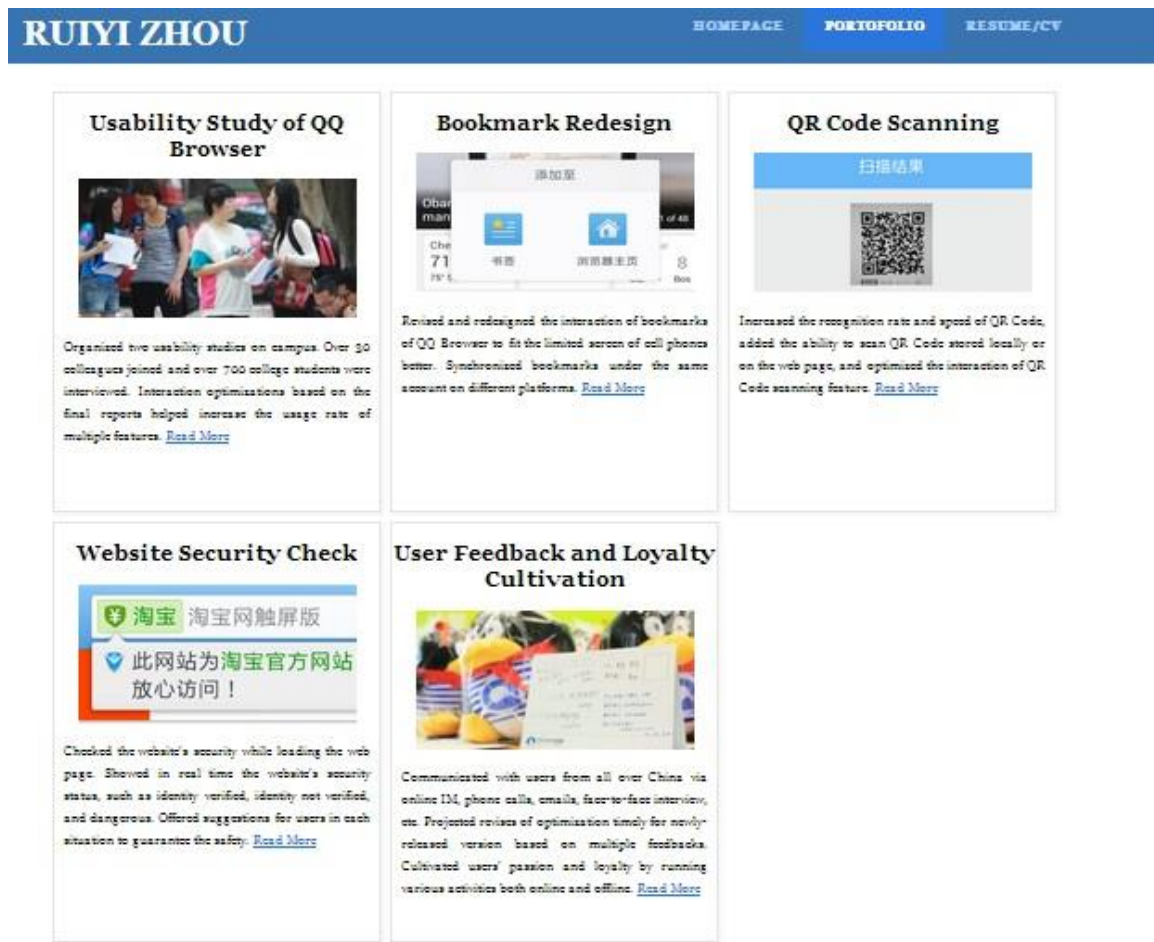


Figure 1. Personal Website

Sample Code:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title></title>
<meta name="keywords" content="" />
<meta name="description" content="" />
```

```

<link href="http://fonts.googleapis.com/css?family=Open+Sans:400,300,600,700,800" rel="stylesheet" />
<link href="default.css" rel="stylesheet" type="text/css" media="all" />
<link href="fonts.css" rel="stylesheet" type="text/css" media="all" />
<link rel="shortcut icon" href="http://ruiyizhou.me/favicon.ico" type="image/x-icon"/>
<link rel="icon" href="http://ruiyizhou.me/favicon.ico" type="image/x-icon" />
<!--[if IE 6]><link href="default_ie6.css" rel="stylesheet" type="text/css" /><![endif]-->

</head>
<body>
<div id="header-wrapper">
    <div id="header" class="container">
        <div id="logo">
            <h1><a href="http://ruiyizhou.me">Ruiyi Zhou</a></h1>
        </div>
        <div id="menu">
            <ul>
                <li><a href="http://ruiyizhou.me" accesskey="1" title="">Homepage</a></li>
                <li class="current_page_item"><a href="portfolio.html" accesskey="2"
title="">Portofolio</a></li>
                <li><a href="cv_RuiyiZhou.pdf" accesskey="3" title="">Resume/CV</a></li>
            </ul>
        </div>
    </div>
</div>
</div>
<!--<div id="featured">&nbsp;</div>
--><div id="wrapper">
    <div id="page" class="container">
        <div id="content">
            <h2>Usability Study of QQ Browser</h2>
            <h2></h2>
            <p>Organized two usability studies on campus. Over 30 colleagues joined and over 700 college students were interviewed. Interaction optimizations based on the final reports helped increase the usage rate of multiple features.
                <a href="usability_study.html">Read More</a></p>
        </div>
        <div id="content" >
            <h2>Bookmark Redesign</h2>
            <h2></h2>
            <p>Revised and redesigned the interaction of bookmarks of QQ Browser to fit the limited screen of cell phones better. Synchronized bookmarks under the same account on different platforms.
                <a href="bookmark_redesign.html">Read More</a></p>

```

```
</div>
</div>
</div>

<div id="footer">
  <p>Copyright Ruiyi Zhou. All rights reserved.</p>
</div>

</body>
</html>
```

Usability Study of QQ Browser (based on Android)

Note: Teamwork

Team Role: organizer, reporter

Duration: March 2013 – June 2013

Main Functions:

- To learn how students use their cellphones and apps.
- To do usability study on some functions of QQ Browser.
- To talk with students about their opinions and needs.

My Contributions:

- Offered questionnaire and task script.
- Organized the usability study.
- Wrote the final report.
- Optimized several functions according to the results of the two usability studies.

Project Description:

We went to Southwestern University of Finance and Economics (SUFU) and Chongqing University of Posts and Telecommunications (CUPT) respectively to investigate two different groups of college students. Students from SUFU mainly major in finance and economics, while students from CUPT mainly major in engineering. The results of usability test showed that education background could largely affect how students use browser. Specifically speaking, students from SUFU used more advanced features of browser, such as saving webpage for offline use, synchronizing bookmarks, and downloading software from browser's software market. In contrast, students from SUFU basically just used browser for searching information, watching news and browsing social networking sites.

Another general phenomenon was the limit of monthly data allowance, internet speed, and accessing to WiFi. In China, monthly data allowance for cellphone is mainly from 30M-100M, only 30% of the people who use cellphone to access to network use 3G network, and less than 30% of these people use WiFi. Based on these

facts, people, including students of course, prefer simple and small webpages when they are using cellphone browser because these websites require only little data usage.

We also conducted usability test on some central functions of QQ Brower, such as bookmark, share and news. During the usability test, users did some required tasks according to a script while we learned and watched alongside. Besides, by face-to-face interview we discussed with students about the possible revisions of QQ Brower they liked and what function they thought they needed the most. They also showed us their classroom, cafeteria, and dormitory where they usually used QQ Brower.

Optimization based on these two usability test were made. For instance, QQ Brower now can convert a large webpage into a relatively small one. This feature is among users' favorites and leads to the increase of PV.



Figure 2. Usability Study

Related Materials:

questionnaire

final report

Bookmark Redesign for QQ Browser (based on Android)

Note: Teamwork

Team Role: UI designer, product manager

Duration: January 2013 – June 2013

Website: mb.qq.com

Main Functions:

- Users now do not need to choose from one of the two bookmark systems every time they are adding a

bookmark. Instead, they only need to choose where they need the bookmark to be showed, the homepage of QQ Browser or the bookmark page.

- All bookmarks users added will be automatically synchronized to other platforms. Users using different devices such as personal computer, smartphone, and iPad, can now find their bookmarks on all the devices.

My Contributions:

- Offered three different design plans for choice and discussion.
- Prototyped.
- Conducted usability study during the design process.
- After release, supervised user feedback and offered optimization plan.

Project Description:

QQ Browser once had two separate bookmark systems. One bookmark system was shown on the homepage of browser, which we called the homepage bookmark. Homepage bookmark was designed to mark the frequently-used websites. Users were able to send some of these homepage bookmarks to desktop of their mobile phones. Another bookmark system was shown on the bookmark page, which could be accessed through main menu of the browser. We called this bookmark system the common bookmark. Common bookmark was designed before the homepage bookmark to offer the basic capability of saving bookmarks and it was not that different from the homepage bookmark except it was not shown on the browser's homepage. There was a kind of redundancy here. Besides, most users were sticking to a particular kind of bookmark system they were familiar with, and were not willing to change their habits. Thus we separated the users of bookmark into two groups because of the bad design.

To solve this program, we redesigned to bind in these two bookmark systems into one. The key design concept was that all bookmarks were stored on the bookmark page, while users could send some frequently-used bookmarks to the browser's homepage for convenient use, just like users could send some bookmarks to the desktop of mobile phone.

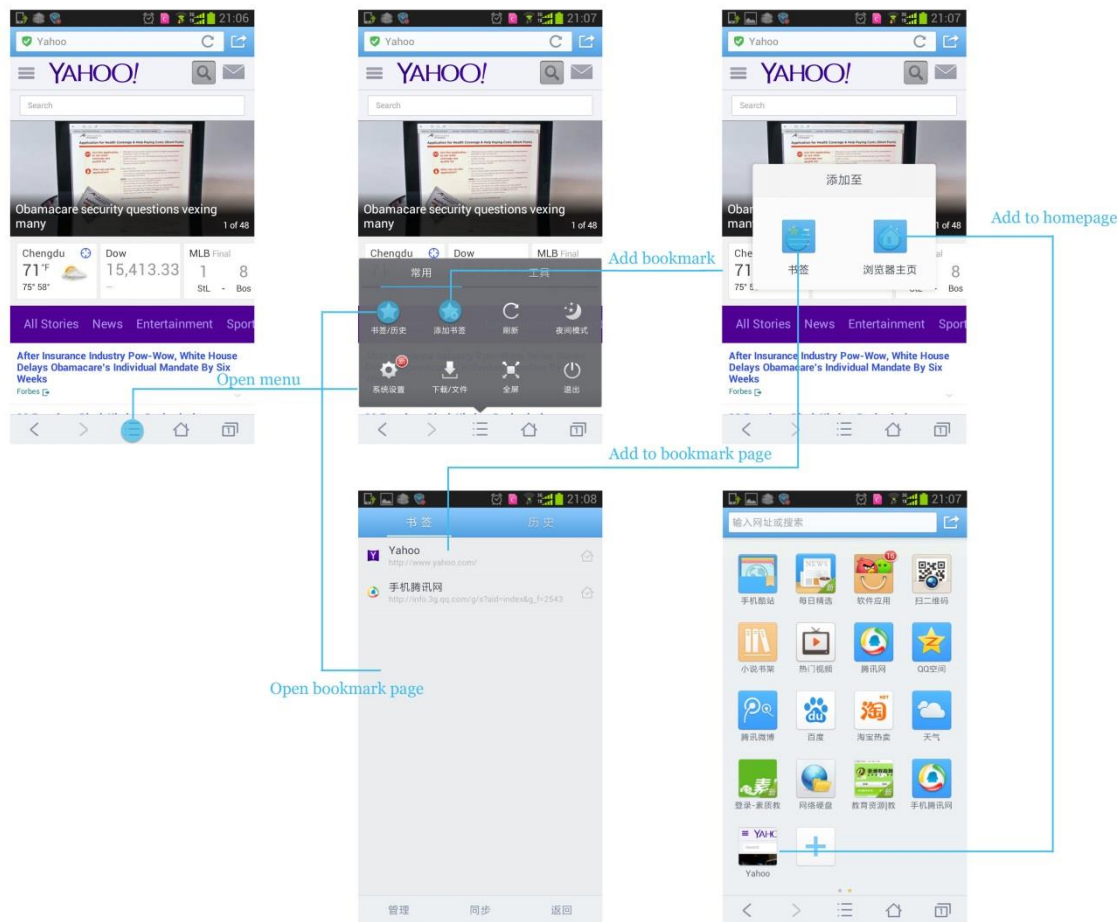


Figure 3. Bookmark Redesign

QR Code Scanning for QQ Browser (based on Android)

Note: Teamwork

Team Role: UI designer, product manager

Duration: July 2012 – June 2013

Website: mb.qq.com

Main Functions:

- Users can scan a QR Code using a camera phone.
- Users can scan a QR Code from a local-stored picture, or an online picture.
- During scanning using a camera phone, the flashlight could be used to enlighten the QR Code if the environment is dark.
- Barcode scanning is also supported.

My Contributions:

- Consistently revised the interaction during a year.
- Added new functions such as scanning a QR Code from a local-stored picture, or an online picture.
- Conducted usability study during the design process.
- After release, supervised user feedback and offered optimization plan.

Project Description:

QR Code could store the information of a paragraph of words, a HTML link, a name card, etc. The principle of QR Code Scanning was that if we use the camera to shoot a QR Code, QQ Browser could decode the QR Code and get the information stored in it. We reinforced the QR Code Scanning to make it much stronger. First of all, QQ Browser could recognize a paragraph of words, and a HTML link, which could be either stored as a bookmark or open in a new window. Secondly, QQ Browser could recognize the information of a name card, and users could save the information directly as a name card in contacts, or dial the phone number offered, or send an email to the email address offered.

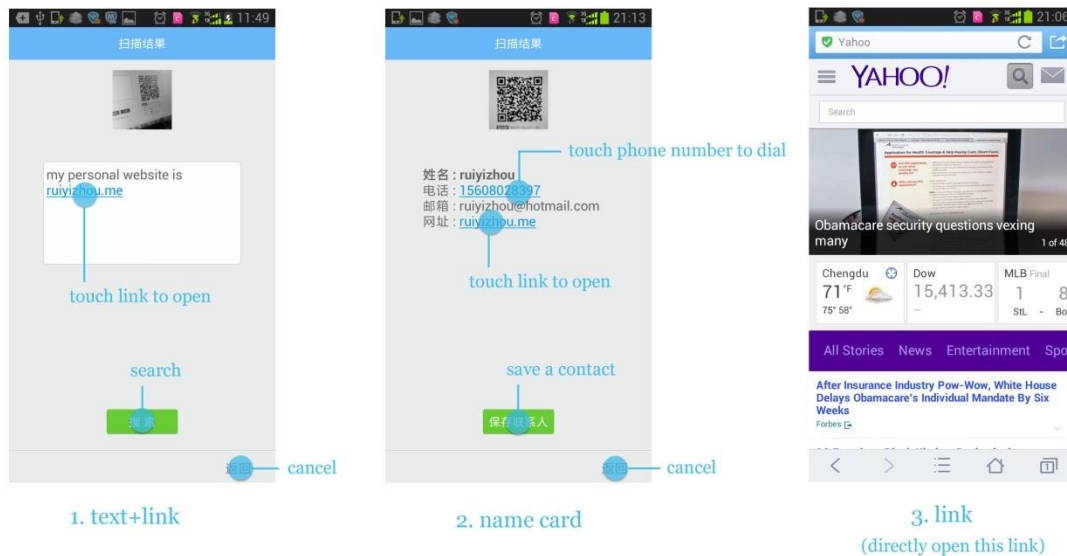


Figure 4. QR Code Scanning support different kinds of contents

What was more, not only the QR Code shot by the camera could be recognized, the QR Code stored locally on the phone and the QR Code showed on a webpage could also be recognized, which was quiet original because other apps or software could only recognize the QR Code shot by the camera.

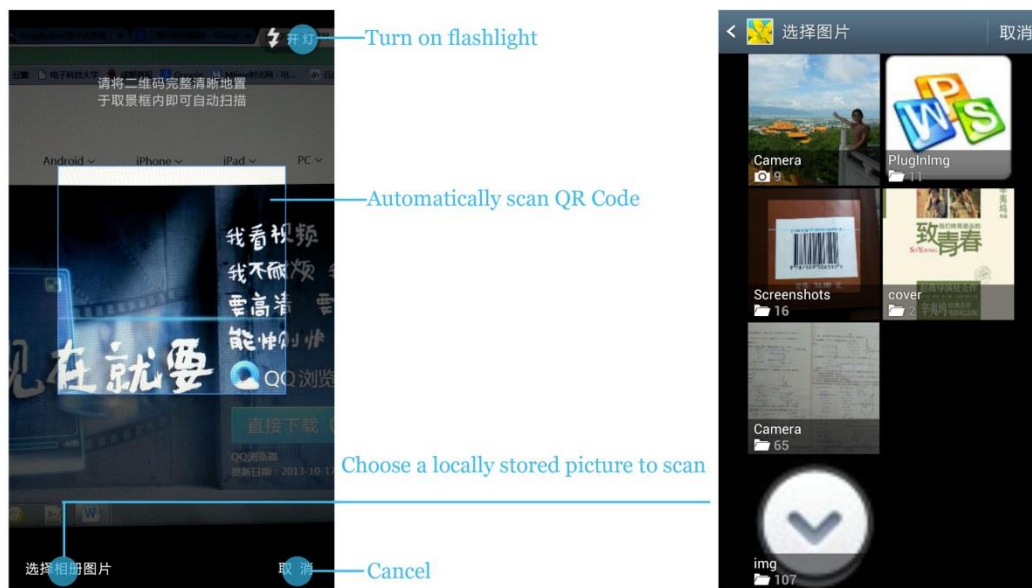


Figure 5. Scanning a picture shot by camera or stored locally

In addition, we also supported the recognition of barcode, which was widely used on almost every product. Users could use QQ Browser to recognize the barcode and search for more information on the Internet. In the future, users might be able to buy the product they wanted by using QQ Browser to scan the barcode.

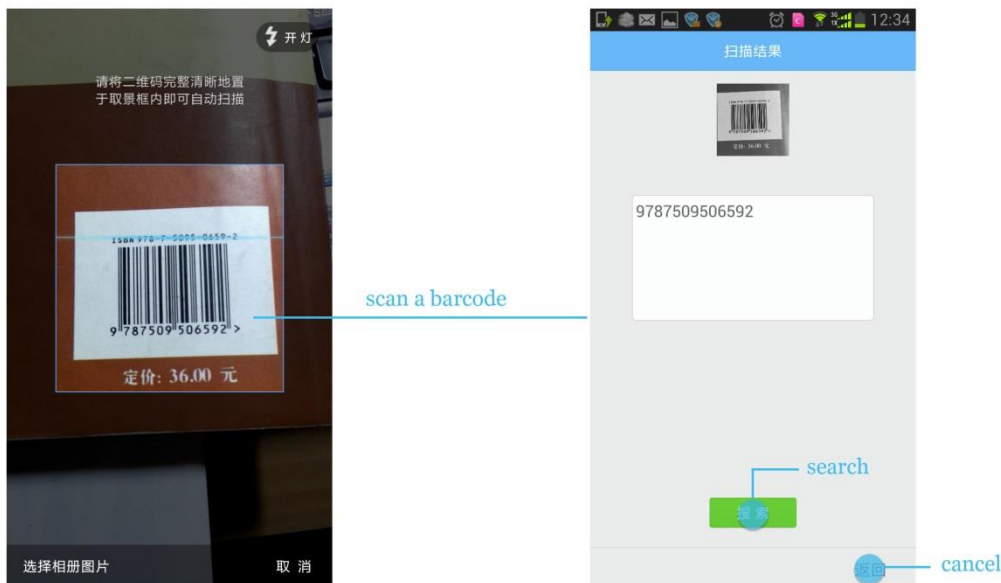


Figure 6. Barcode is also supported

Website Security Check for QQ Browser (based on Android)

Note: Teamwork

Team Role: UI designer, product manager

Duration: November 2012 – June 2013

Website: mb.qq.com

Main Functions:

- Check the website's security status during loading the web page.
- Demonstrate the website's security status on the address bar of QQ Browser.
- Block dangerous websites in case of loss.
- Pay special attention to online money transfer websites and eBusiness websites.

My Contributions:

- Designed the interaction of Website Security Check function.
- Conducted usability study during the design process.
- After release, supervised user feedback and offered optimization plan.

Project Description:

It was the browser's responsibility to check the website's security status, warn user, and guarantee the safety. So we designed the website security check system. Once user clicked on a new link, the browser would check the new website's security status while loading it. If the website was identity verified, a green icon would appear on the address bar to notify the user that the website was safe, without interrupting him/her. If, on the other hand, the link was about to open linked to a dangerous website, a red icon would appear on the address bar and QQ browser would interrupt the loading and show a warning page, indicating that the website was dangerous for the potential risk of password leak and other kinds of loss. It would specifically explain about why this webpage was blocked. On the warning page, the advised action to close the window would also be demonstrated.

As to certain websites related to online money transfer, such as Paypal, Alipay, and Tenpay, and eBusiness websites such as Amazon and Taobao, the website security status would be checked under more strict standards.

Besides, the database of fake websites would be updated in real time. Thus QQ Browser might be able to deal with emergent situation. For instance, if a newly-appeared website tent to be dangerous, QQ Browser could update its database in a very short time and make sure the users could get appropriate warning if they attempted to view this website.



Figure 7. Identity-verified website



Figure 8. Dangerous website

Users Feedback and Loyalty Cultivation

Duration: July 2011 – Present

Main Functions:

- Get user feedback as soon as possible and optimize the design according to valuable feedbacks.
- Cultivate a group of valuable users to offer help to us.

My Contributions:

- Built up the complete feedback system.

- Get feedback from users from all over China.
- Cultivated users' loyalty.

Project Description:

I communicated with users from all over China via online IM, phone calls, emails, face-to-face interview, etc. I dealt with more than 500 feedbacks a day. I sorted these feedbacks into different categories according to their worth. About 5% of the feedbacks were very valuable, these feedbacks either reflected severe bugs or hard-to-accept designs. Once getting these feedbacks, I would immediately build up a team to revise our designs and codes. If necessary, an updated version would be released within 3 days since the feedback.

Besides, I cultivated users' passion and loyalty by running various activities both online and offline. Recently, at the end of year 2012, I sent letters of thanks and gifts to some valuable users who had been supportive during the whole year. Their happiness of getting these letters and gifts were spread out through online social networking such as Weibo and attracted many new users of QQ Browsers. Each month, a name list of valuable users would be updated and the users on the list would get a gift, and their name would appear on the thanks page of each released version of QQ Browser. Now, thanks to the loyalty cultivation plan, we have more than 500 valuable users who actively offered their help to us, such as being the admin of online forum, answering other users' questions about the product, and pointing out the bugs and bad designs we left out.

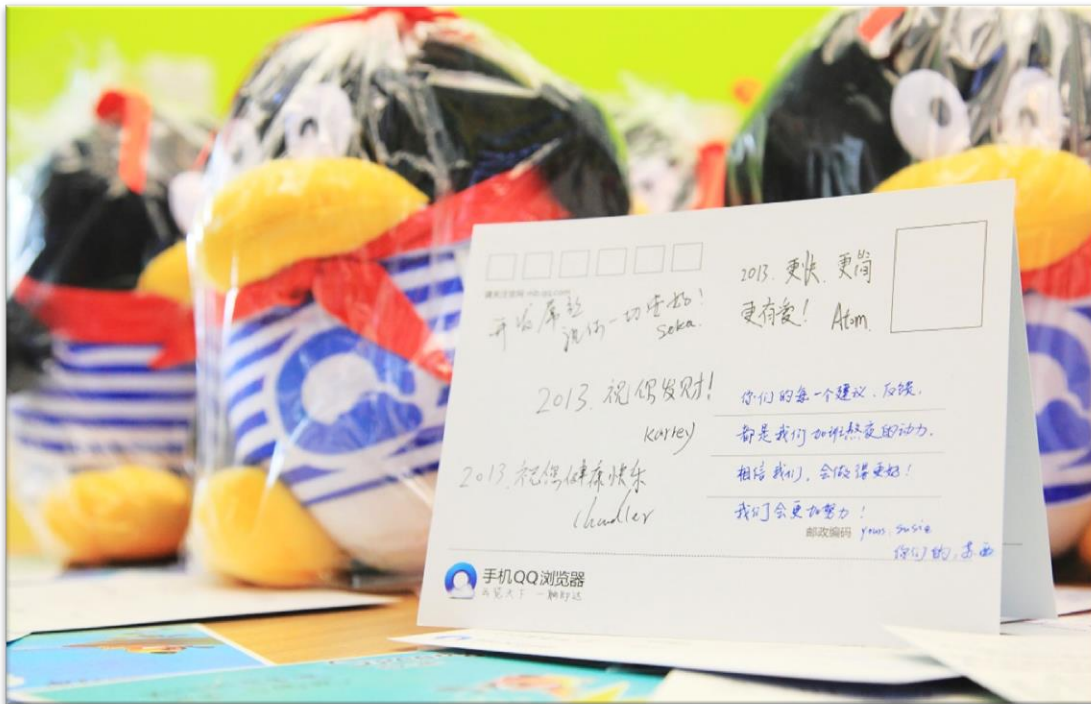


Figure 9. User feedback and loyalty cultivation

The Design of a Robot for a Nuclear Power Plant

(curriculum project of the course Electro-mechanical Measuring and Control Technology)

Note: Teamwork

Team Role: programmer, reporter

Duration: May 2011 – July 2011

Main Functions:

- Path planning and obstacle avoidance.
- Two degrees of freedom of movement of a robotic arm.

My Contributions:

- Designed two degrees of freedom of movement of a robotic arm.
- Calculated the movement and position of the two degrees of freedom of movement of a robotic arm, given the initial conditions.
- Wrote and presented final report.

Project Description:

Back in March 2011, the Fukushima Daiichi nuclear disaster happened and workers inside the Fukushima I Nuclear Power Plant were exposed in radiation. In this course, we learned the control theories and technologies. So I and my three classmates thought that using robots instead of human beings in nuclear power plant might prevent these disasters from happening. We then chose the design of a robot for a nuclear power plant as the topic of our curriculum project.

Related Materials:

We used MATLAB for programming and simulation. Here is a sample of code I wrote. The function of this code is to calculate the equations of motion and the position of the two-degrees-of-freedom robotic arm.

```
l1=50;l2=30;
for m=1:9628
To1=[cos(cta1(m)),-sin(cta1(m)),0,l1*cos(cta1(m));
sin(cta1(m)), cos(cta1(m)),0,l1*sin(cta1(m));
0,      0,      1,0;
0,      0,      0,1];
To2=To1*[cos(cta2(m)),-sin(cta2(m)),0,l2*cos(cta2(m));
sin(cta2(m)), cos(cta2(m)),0,l2*sin(cta2(m));
0,0,1,0;
0,0,0,1];
O=To2*[0;0;0;1];
plot(O(1),O(2));
hold on;
end
hold off;
xlabel('x');ylabel('y');
tf=12.5;t=0:0.01:tf;cta1=10; cta2=60;
```

```

cta=cta1+3*((cta2-cta1)/(tf^2))*(t.^2)-2*((cta2-cta1)/(tf^3))*(t.^3);
plot(t,cta, '-b');
xlabel('t');ylabel('degree');
tf=5;t=0:0.01:tf;cta1=0;cta2=30;
cta=cta1+3*((cta2-cta1)/(tf^2))*(t.^2)-2*((cta2-cta1)/(tf^3))*(t.^3);
ctadiff=6*((cta2-cta1)/(tf^2))*(t)-6*((cta2-cta1)/(tf^3))*(t.^2);
ctadiff2=6*((cta2-cta1)/(tf^2))-12*((cta2-cta1)/(tf^3))*(t);
plot(t,cta, '-b');hold on;plot(t,ctadiff, 'g'),plot(t,ctadiff2, '-r');
xlabel('t');ylabel('degree');
grid on;
tf=10;t=0:0.01:tf;cta1=0;cta2=30;
cta11=cta1+3*((cta2-cta1)/(tf^2))*(t.^2)-2*((cta2-cta1)/(tf^3))*(t.^3);
tf=12.5;t=0:0.01:tf;cta1=10;cta2=60;
cta22=cta1+3*((cta2-cta1)/(tf^2))*(t.^2)-2*((cta2-cta1)/(tf^3))*(t.^3);
for n=1:1251,z(n)=30;
end
for n=1:1001;z(n)=cta11(n);
end
plot(t,z, '-b');hold on;
xlabel('t');ylabel('degree');
plot(t,cta22, '-g');
l1=50;l2=30;
for m=1:1251
To1=[cosd(z(m)),-sind(z(m)),0,l1*cosd(z(m));
sind(z(m)), cosd(z(m)),0,l1*sind(z(m));
0, 0, 1,0;
0, 0, 0,1];
To2=To1*[cosd(cta22(m)),-sind(cta22(m)),0,l2*cosd(cta22(m));
sind(cta22(m)), cosd(cta22(m)),0,l2*sind(cta22(m));
0,0,1,0;
0,0,0,1] ;
O=To2*[0;0;0;1];
plot3(O(1),O(2),t); xlabel('x');ylabel('y');
hold on;
end
hold off;

```