



KTH Computer Science  
and Communication

***Degree Project in  
Computer Science  
First Level***

***East-West Attitudes towards  
Integrated Communication Tools***

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## **Abstract**

This paper contains a study attempting to answer the differences in East-West attitudes towards integrated communication tools. It does so by attempting to study Tencent QQ, a very popular instant messaging application in China. This paper attempts to answer this question by conducting interviews using a presentation of the Tencent QQ application and a subset of the questions defining the Unified Theory of Acceptance and Use of Technology. The study concludes that more time and effort is needed to modify this theory and adapt interview and user testing techniques to obtain a reliable answer.

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## Document Change Record

Version	Description	Comments
1.0	First Submitted Version	

## Introduction

The purpose of this paper is to study the differences between Western and Eastern attitudes towards integrated communication tools. Specifically this paper aims to study the Chinese Instant Messaging program Tencent QQ and hopefully answer some questions as to this application's popularity in China compared to the West.

## Background

Social networking and instant messaging platforms are one of the mainstays of the modern Internet. Here in the West we have several major providers of social networking, instant messaging, and a plethora internet services linked to each provider's network. Historically, each provider of an Internet service here in the West has been known by their signature product. When someone says Twitter, we automatically think of the 140 character limit of an SMS interface and a fast flowing message log. When someone says Facebook, we automatically think of a newsfeed and a multitude of status messages, requests, and pictures all wanting your attention. When someone says Google, people almost automatically think Search, and possibly also, email. When someone says Microsoft, people automatically think Microsoft Windows and Office. When someone says Skype, people automatically think instant messaging and VoIP.

In China Internet services have a somewhat of a different distribution. According to GlobalWebIndex's<sup>1</sup> statistics, the social networking platform in China can be described as something of a duopoly between Sina<sup>2</sup> and Tencent.<sup>3</sup> If you however factor in that Qzone, Tencent, and Tencent Weibo actually all belong to the Tencent network, it would appear that Tencent totally dominates the social network platform in China.

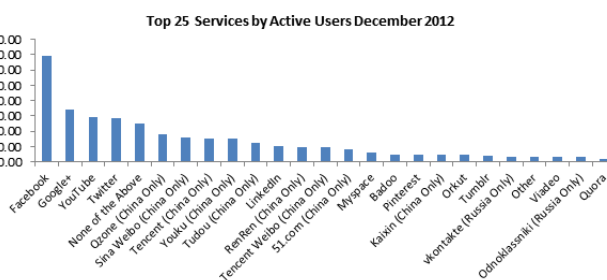


Illustration 1: Graph courtesy of GlobalWebIndex

## Tencent

Tencent is known to most users in China as Tencent QQ. Tencent QQ started life as a Chinese clone of the Western instant messaging program ICQ. At its inception in 1999, it inherited many of the features present in the then current version of ICQ. Since then, features originating from several distinct Western Internet service platforms has been folded into the platform.

Today, Tencent and its various web services represent the dominant internet service and social networking platform in China. From their desktop application, the QQ Instant Messenger,

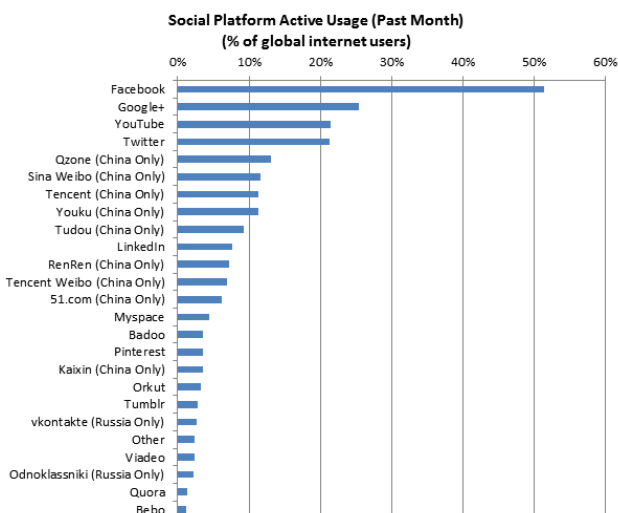


Illustration 2: Graph courtesy of GlobalWebIndex

1 <http://www.globalwebindex.net/thinking/social-platforms-gwi-8-update-decline-of-local-social-media-platforms/>  
 2 <http://www.sina.com.cn/>  
 3 <http://www.tencent.com/>

Chinese users can access a multitude of internet services, all integrated under a single login and account system.

Users can chat using the QQ Instant Messaging Service, through which they also can engage in discussion group chats with their friends as well as join IRC like chat rooms. Through the IRC like chat rooms they can also access each chat room's web presence. The web presence includes a discussion forum, a general file sharing area, a message log, as well as chat room member contact information.

Users also have a staggering array of Tencent web services available to them. Users can access their own user center using the Tencent website. When logging in to this system, Qzone, they can create a Facebook like profile where they can share pictures, update their status, as well as write blog posts as well as send gifts to friends. They can also use the QQ Instant Messaging platform to play games with one another, watch movies, and buy and sell virtual gifts. They can use Tencent Weibo, which is a clone of the Western service Twitter, as well as access shopping, online dating, and even a PC Security Suite application, all without ever leaving Tencent's platform.

All of these services is underpinned by a VIP system. Using this system, Tencent is able to charge the user, for various services. For example, Tencent charges for the ability to create certain types of IRC like chat rooms, or for the privilege of having animated personal avatars, or for the privilege of having background music on their own Qzone profile. Tencent also charges for extra high quality music, video, virtual gifts, as well as a plethora of SMS and mobile device services.

## ***Problem Statement***

The purpose of this paper is thus to conduct a study of a limited subset of the QQ user interface. The purpose is to attempt to gain an understanding into why a unitary social networking and internet service such as QQ has been able to thrive in China, while Internet services in the West have largely been known by their signature product. The purpose is to investigate the reactions to the QQ program from Western audiences, and hopefully gain an insight into why a service like QQ works in the East and not in the West, and maybe answer the question of why there is no equivalently powerful vertically integrated online service in the West.

## ***Review of Previous Studies***

To the best of the author's knowledge, a study of this nature on Tencent QQ has not been attempted before. The existing literature has no reference to it, not even to the type of limited study that is to be conducted in this study. The author has made every attempt to track down previous english language studies on the subject. However, due to time limitations, the author acknowledges that the existence of such studies may have escaped notice. The status of the reference material is fundamentally changed if Chinese language, non-internationally published research articles generated in mainland China are taken into account. However, the usage of non-English research material is beyond the scope of the reference material for this study.

Even though there are no articles directly studying this particular application and platform, there are several articles that have been insightful in the writing of this report.

(Rau et al. 2003/2004: 12) published an article studying cross cultural differences in knowledge representation and structure in human computer interfaces. Rau et al studied implications of cultural design on HCI, specifically, the performance of Chinese and American computer users on interfaces designed for field dependent (Chinese) and field independent (American) populations. The study concluded that the use of a thematic user interface led to a lower error rate in for Chinese computer

users. It concluded that “This study provides additional evidence in-line with results from past studies that the Chinese employ a different thinking style from Americans.” (Rau et al. 2003/2004: 12)

“A study of the cultural effects of designing a user interface for a web-based service” (Rau & Liang, 2003) also provided a theoretical insight into the study of cross cultural computer usage. Rau and Liang's study applies two major theories in their study. The first is Hofstede's cultural dimensions theory, and the second is Hall's extension and focus on multicultural communications.

(Xie et al. 2008) also uses Hofstede's cultural dimensions and Hall's work on cultures to study the impact of cultural diversity on communication effectiveness across cultures and how to apply these to the user interface design of IT communication systems.

A study on cultural differences reflecting social networking use (Jackson & Wang, 2013) used a multitude of theoretical research to conclude that “online culture reflects the offline culture in which it is embedded” (Jackson & Wang, 2013, p 919).

(Lu et al. 2008) conducted a study on Chinese user's acceptance of instant messaging. In this study, they used two theoretical models that contributed to the analysis in this report. Firstly, they used the Technology Acceptance Model, (TAM) (Davis, 1989). Secondly, they use the Theory of Planned Behavior (Icek, 1999).

The most important insight however was the highlighting of the Technology Acceptance Model and the subsequent work done by Venkatech to propose the Unified Theory of Acceptance and Use of Technology (Venkatesh et al. 2003). This is the theory used to conduct the majority of the interviews in this report.

All these previous studies provided valuable insight into the issues of cultural diversity and different cognitive frameworks and worked to provide valuable theoretical background. This theoretical background would be of use during the formulation of interview material and questionnaires used as part of this study.

## ***Personal Interest***

The author of this report has a history of being active in the reception for international students at KTH (The Royal Institute of Technology), in Stockholm, Sweden for over four years. Very early, the author recognized that the use of the communication platform Tencent QQ enabled Chinese internet populations to communicate more efficiently and effectively.

The integrated software platform facilitated communications with an otherwise very hard to understand student group. The usage of Tencent QQ and it's IRC-like group chat function enabled the author as one single person to communicate and effectively organize several hundred students arriving to study at KTH each year. The author managed to do this without any access to official transcripts containing student contact details, or using any internal communication resources available to school administrators.

The author thus has a personal interest in ascertaining the theoretical underpinnings for the success of this application. The author realizes that a similar platform does not exist in the West, and thus the wants to research the circumstances regarding its usage. The author wants to develop a theoretical underpinning as to why Tencent QQ managed to develop and thrive in the Chinese Internet market, while it's ancestor in the West, ICQ, has long faded into obscurity.

## Methods and Procedure

### Theoretical Underpinnings

Hofstede's cultural dimensions theory provide very solid theoretical underpinnings for theoretical qualitative analysis of interview results.

The following is a summary of Hofstede's cultural Dimensions theory. The theory defines specific dimensions that can be used to analyze various cultures:

- **Power Distance:** The social distance between people of different rank and position and the willingness to accept that rank.
- **Individualism vs Collectivism:** The extent to which individuals within an society act as a group or as individuals when making decisions, solving problems and executing actions.
- **Uncertainty Avoidance Index:** The extent to which uncertainty and ambiguity is accepted.
- **Masculinity vs Femininity:** The extent to which the society exhibits traits that are associated with traditional masculine and feminine values.
- **Long-/Short-term Orientation:** The extent to which the society focuses on long term vs short term goals and rewards.

Edward T. Hall's work on cultures also provides theoretical underpinnings. Specifically:

- **Monochronic vs Polychronic Time Orientation:** The tendency to focus on one thing at a time vs several things at a time.
- **High Context vs Low Context Cultures:** In high context cultures there are many contextual and cultural elements that help people understand communication. In low context cultures more information must be transmitted to make up for the lack of standard context and shared culture.

Both Hofstede and Hall's work was taken into account when asking qualitative questions throughout interviews as conducted as part of this study.

The usage of the Technology Acceptance Model (Davis, 1989) and the Theory of Planned Behavior (Icek, 1991) in (Lu et al 2008) provide some insightful theoretical background. The most significant contribution of these two theories however was their inclusion into the Unified Theory of Acceptance and Use of Technology.

The Unified Theory of Acceptance and Use of Technology (Venkatesh et al. 2003) provides the main theoretical basis for the interviews conducted in this study.

The Unified Theory of Acceptance and Use of Technology was defined by Venkatesh as a method for measuring technology acceptance in the context of organizations. It is designed to test technology acceptance in the context of an organization, for example a company, over a period of time and is designed to be used on data

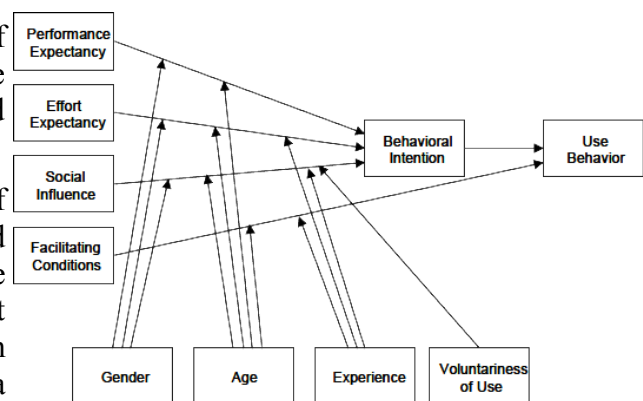


Illustration 3: The Unified Theory on Acceptance and Use of Technology



collected over a period of time.

The Theory itself defines eight major independent variables that determine a user's behavioral intention the probably and form of technology adoption by a user or groups of users.

The eight major independent variables are defined as follows:

1. **Performance Expectancy:** “The degree to which an individual believes that using the system will help him or her to attain gains in job performance.”
2. **Effort Expectancy:** “The degree of ease associated with the use of the system.”
3. **Social Influence:** “The degree to which an individual perceives that important others believe he or she should use the new system.”
4. **Facilitating Conditions:** “The degree to which an individual believes that an organization and technical infrastructure exists to support the use of the system.”
5. **Gender:** The gender of the user or the gender spread of the user's social group and/or the organization's technical support structure.
6. **Age:** The age of the user or the age spread of the user's social group and/or the organization's technical support structure.
7. **Experience:** The general experience the user has with the technical system or similar technical systems and any prior experience for the specific system under evaluation.
8. **Voluntariness of use:** “The extent to which potential adopters perceive the decision to be non-mandatory.”<sup>4</sup>

These eight major independent variables are then used to construct questions to be used in a questionnaire, divided into five different areas. In this interviews, only the first questions from the first four areas were used. The data for the fifth area, attitudes was judged to be more effectively collected if asked verbally over the entirety of the interview. The different areas and their questions are listed in Appendix I.

## **Limitations**

The theory used in the interviews, the Unified Theory of Acceptance and Use of Technology, as developed, was meant as a theory to measure usage and acceptance of technology over time in the context of an organization, such as a company. As such, it would be less suited to measure the initial impressions potentially leading to the potential adoption of a foreign piece of technology. This is the reason the questions in table five were asked during the course of the entire interview instead of being answered in the questionnaire. While there have been derivative works modifying UTAUT, several measuring the adoption of technology on a voluntary and individual basis, such an adaption was not made in for this report. This is due to the fact that such an adaptation of an already very complicated theory would take more time than allotted for the completion of this project.

## **Methods and Procedure**

The method selected for the gathering of data was that of direct interviews. The interview subjects were presented with a general overview of Tencent QQ in the form of a Powerpoint Presentation, and asked questions similar to section five of UTAUT throughout the interview. The subjects were

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4 Diagram of UTAUT and quotes from description taken from Venakesh's official website, source: [http://www.vvenkatesh.com/organizations/Theoretical\\_Models.asp](http://www.vvenkatesh.com/organizations/Theoretical_Models.asp)

then given the option of testing a live version of Tencent QQ within a specifically constructed virtual machine, with specifically registered test accounts. Last but not least, the interviewees were asked to fill out the remaining questions of the UTAUT form on a n/a (not applicable), and 1 to 7 scale. The answer not applicable (n/a) was provided for questions deemed out of scope or not relevant to the discussion.

### ***Selection of Interview Subjects***

Subjects for the interviews were selected on a more or less random basis. Most of the interviewees were acquaintances or friends of the author, but since almost none of these subjects had been in contact with Tencent QQ prior to the interview, this was judged to be acceptable. The final interview roster consisted of 7 students and one faculty at Media Technology at the School of Computer Science and Communication at KTH. One of these 7 students was a full time student union representative. The final student had prior experience with Tencent QQ and knew Chinese.

### ***The Presentation of Tencent QQ***

A presentation of Tencent QQ instead of a live user interface test was chosen because the application of study, Tencent QQ had a Chinese user interface. Chinese was not a language that was understood 7 of the 8 interview subjects.

The decision provide a presentation of the original Chinese language version of Tencent QQ instead of allowing live user testing on an existing international version was done on the basis of differing features. Specifically, many features considered to be essential parts of the user experience of the Chinese version of Tencent QQ were missing from the English international version.

The presentation of the original Chinese version was made using screenshots of the live program. Throughout the presentation, labels were provided in English using red text to translate Chinese text and/or to highlight icons and other user interface features that might have been unclear. User interface features that were not mapped out in advance was also explained upon inquiry by the interview subject. The screenshots themselves were made using accounts created for the specific purpose of being used in the interview, and also the real account of the author featuring a real contact list and real conversation and IRC chat history.

A decision was made to focus on only part of the Tencent QQ user interface. The decision was made partly because these were judged to be the most heavily used parts of the user interface. Specifically, a decision was made to concentrate on instant messaging, group chat, history, and settings.

The presentation itself began with the login screen of the QQ application. It then progressed to present three views of the main user interface, namely the contact list, group chat list, and the history views. After this, the presentation then progressed to presenting some important context menus in these views. After the presentation of the main user interface came a presentation of the two most heavily used chat windows. The first of these windows, was the instant messaging window and its various submenus and features. After this, the group chat window and settings dialogs were presented. Lastly, a presentation of Tencent QQ's logging features, and settings windows was presented.

Throughout the presentation, explanations on various GUI features were provided, and various functions that the interviewee was interested in highlighted. Questions similar in form and identical in content to table five of UTAUT were asked throughout. This was in order to obtain more in-depth answers than those that could be obtained if they were just asked as part of the normal

questionnaire.

### ***The Questionnaire***

After the presentation, the users were asked to fill out the questionnaire. The author recognizes that the questionnaire might have been out of place for the purpose of this interview, but the author felt that the application of an established model was better than just writing questions out of thin air. The questionnaire was as much about gauging the interviewees reaction to the individual questions and asking and answering follow-on comments as it was about filling in the questions themselves. The use of a subset of UTAUT provided some important insights into a proposed future in-depth study on the subject.

## **Results and Discussion**

The results of the interviews were perplexing, and the final analysis of the interviews yielded some important insights.

### ***A Qualitative Analysis***

The results from the 8 interviews was 7 interviews with students producing a mix of quantitative and qualitative data, and a pure interview with a member of staff at KTH producing purely qualitative data.

The results of interviewing only eight subjects precluded the use of a statistical analysis. This actually ended up benefitting the entire study as many of the answers on the UTAUT questionnaire indicated that the questionnaire would have to be extended and thoroughly reworked before being applied to a much wider audience. Many users answered n/a on several questions as they believed they had received too little information to properly answer many of the questions.

The application of UTAUT was the result of wanting to use an established model for a situation that the model seemed to be designed. However, due to low interview rates, inexperience, and lack of time the results produced could at best be used as the basis for a wider, more extensive study.

### ***An Analysis of UTAUT***

First and foremost, the constructs and questions in Table 1 indicated that UTAUT was meant primarily as a way of measuring the adoption of technology over time in organizations. The questionnaire and data analysis was to be used as a tool, applied during critical times over the course of new technology adoption in an organization. Due to the fact that this questionnaire was applied once, over what could be described as the beginning of a trial, these questions did not produce any usable results. Many interview subjects answered n/a to the questions in this table due to too little information being available. Only one of the interviewees had used Tencent QQ over a longer period, and one sample does not a survey make.

The constructs and questions in Table 2 suffer from the same deficiencies as the constructs in Table 1. First and foremost, a presentation was made of a program that used an interface that the wider interview population did not understand. The reason for making a presentation instead of a live user test has already been motivated. However, due to the absence of a live user test, many of the answers to the questions in Table 2 amount to mere conjecture by most of the interviewees. Once again, the subject that had used Tencent QQ previously could make an accurate assessment of questions asked.

Table 3 deals with social influence. A survey about social influence about an application using a language that no one understands and thus can not use, is at best, a basis for conjecture. These constructs might have produced better results if a similar application that could be understood by the interviewees was deployed or in the process of being deployed in the interviewees wider social group and/or organization. The interviewee with prior of knowledge of Tencent QQ could answer these questions properly.

Table 4 produced some interesting answers. Most of the questions in Table 4 revolved around the conjecture of requiring to learn Chinese, or the conjecture of already knowing Chinese and thus being able to easily use and understand the program. Help and compatibility was also touched upon, but as with the other tables, this was mostly conjecture. Once again the interviewee knowing Chinese could provide a proper answer to these questions.

Table 5 produced some interesting observations. As this table was asked during the course of the entire interview, the results were tangible. Attitude towards using the system was once again based on conjecture, whereas motivation was at best a discussion of plausible scenarios. Some interview subjects indicated that with time and a little motivation, they might have enjoyed the system, while others indicated that chat program as it was presented was totally strange and foreign. Emotions were a tricky point. Several interview subjects indicated that a fair emotional reaction would only be possible after extended periods with the program, and thus this subject was not widely entered upon. The interview subject that had previous experience with Tencent QQ gave very insightful commentary to all questions asked during the interview related to the questions in this table.

### ***The Qualitative Data***

Many interview subjects indicated that a live running version with similar features of the original would have elicited better reactions. The interview subject with familiarity with Tencent QQ could answer the questions sufficiently and provided interesting commentary. However, this subject was the only one in the group that could understand Chinese, so the subject's answers and questions are edge cases as far as this study was concerned.

The interview subject that was staff at KTH also provided interesting insights. The subject said that a study of this magnitude was at the Phd level, and that to conduct a proper study several aspects of the application would have to be studied. Among the areas suggested were general GUI, the presentation of graphical elements, the how culture affected the adoption of the program, etc. These would have to be conducted on both Tencent QQ as well as an equivalent service in the West. If none such service existed, maybe it would have to be created.

Theoretical knowledge from related studies as well as the insights from the interview subjects prompted the cancellation of the second phase of the study. This was to consist of the creation of an prototype that was to be tested on Chinese populations. The prototype was to be an Android equivalent of the subset of features presented in the Tencent QQ program presentation. The study would have been troublesome as there would have been no time available to measure adoption over time. The creation of questionnaires and interview questions in accordance with Hofstede and Hall's theory on intercultural communication would also have been difficult at best. They would have to be created to ensure that no meaning would be lost in cultural translation.

## Conclusions

This study produces some very straightforward conclusions. More planning, more theoretical knowledge, and more time would be needed to conduct a proper study to answer the questions asked in the beginning of this report. It would probably require the use of more established theories in the area of multicultural organizational and computer interface design. The conclusion is that studies involving applications designed for different cultural paradigms with different languages provide considerable challenges to producing solid scientific results.

## ***Suggestions for Further Research***

This study was an attempt at studying an application designed for a different culture using a different language. Time constraints as well as the unfamiliarity and lack of suitable models produced varied results. Suggestions for further studies on the subject include:

- A more proper overview of subsets of the program along with a live test study conducted over time with both Western and Chinese subjects. Translations of the text of the original interface would be provided to those subjects that could not understand Chinese.
- A production of a proper prototype and its testing on the same subjects.

The study would be conducted in three phases. The first phase would be a pilot phase to test the suitability of the translation material provided as well as the prototype. The second phase would be the live user testing of the original application with provided translations. The third phase would be the testing of the prototype.

Throughout the trial periods, a modified version of UTAUT taking into account the requirement for adoption on a voluntary and individual basis would be used. These would be administered in the form of a questionnaire during key phases of the test phases, along with qualitative interviews conducted with the help of comments fields on the questionnaires.

The presentation, the questionnaire, and the qualitative interviews would have to be adapted for each target population in accordance to the theories of Hofstede and Hall. This is due to the experimentally proven validity of these theories, some of which was proved in the previous studies mentioned earlier in this report.

The cultural adoption would be in the form of asking the same questions using different syntax, tone, and possibly diction. This to ensure transmission of the same written and verbal information to interview populations with different cultures and to ensure high quality answers on qualitative interviews. The specifics of these adaptations would be left to the future study.

Better scientific results would be produced should these steps be followed in any future study.

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## **Appendix I. Root Constructs defined for UTAUT**

(Tables start on next page.)



**Table 1. Performance Expectancy: Root Constructions, Definitions and Scales**

Construct and Definition	Items
<b>Perceived Usefulness:</b> The degree to which a person believes that using a particular system would enhance his or her job performance.	<ol style="list-style-type: none"> <li>1. Using the system in my job would enable me to accomplish tasks more quickly</li> <li>2. Using the system would improve my job performance.</li> <li>3. Using the system in my job would increase my productivity.</li> <li>4. Using the system would enhance my effectiveness on the job.</li> <li>5. Using the system would make it easier to do my job.</li> <li>6. I would find the system useful in my job.</li> </ol>
<b>Extrinsic Motivation:</b> The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions	<ol style="list-style-type: none"> <li>1. Using the system in my job would enable me to accomplish tasks more quickly</li> <li>2. Using the system would improve my job performance.</li> <li>3. Using the system in my job would increase my productivity.</li> <li>4. Using the system would enhance my effectiveness on the job.</li> <li>5. Using the system would make it easier to do my job.</li> <li>6. I would find the system useful in my job.</li> </ol>
<b>Job-fit:</b> How the capabilities of a system enhance an individual's job performance.	<ol style="list-style-type: none"> <li>1. Use of the system will have no effect on the performance of my job (reverse scored).</li> <li>2. Use of the system can decrease the time needed for my important job responsibilities.</li> <li>3. Use of the system can significantly increase the quality of output on my job.</li> <li>4. Use of the system can increase the effectiveness of performing job tasks.</li> <li>5. Use can increase the quantity of output for the same amount of effort.</li> <li>6. Considering all tasks, the general extent to which use of the system could assist on the job. (different scale used for this item).</li> </ol>
<b>Relative Advantage:</b> The degree to which using an innovation is perceived as being better than using its precursor.	<ol style="list-style-type: none"> <li>1. Using the system enables me to accomplish tasks more quickly.</li> <li>2. Using the system improves the quality of the work I do.</li> <li>3. Using the system makes it easier to do my job.</li> <li>4. Using the system enhances my effectiveness on the job.</li> <li>5. Using the system increases my productivity.</li> </ol>
<b>Outcome Expectations:</b> Outcome expectations relate to the consequences of the behavior. Based on empirical evidence, they were separated into performance expectations (job-related) and personal expectations (individual goals).	<p>If I use the system...</p> <ol style="list-style-type: none"> <li>1. I will increase my effectiveness on the job.</li> <li>2. I will spend less time on routine job tasks.</li> <li>3. I will increase the quality of output of my job.</li> <li>4. I will increase the quantity of output for the same amount of effort.</li> <li>5. My coworkers will perceive me as competent.</li> </ol>



**Table 1. Performance Expectancy: Root Constructions, Definitions and Scales**

Construct and Definition	Items
	6. I will increase my chances of obtaining a promotion. 7. I will increase my chances of getting a raise.

**Table 2. Effort Expectancy: Root Constructs, Definitions and Scales**

Construct and Definition	Items
<b>Perceived Ease of Use:</b> The degree to which a person believes that using a system would be free of effort.	1. Learning to operate the system would be easy for me. 2. I would find it easy to get the system to do what I want it to do. 3. My interaction with the system would be clear and understandable. 4. I would find the system to be flexible to interact with. 5. It would be easy for me to become skillful at using the system. 6. I would find the system easy to use.
<b>Complexity:</b> The degree to which a system is perceived as relatively difficult to understand and use.	1. Using the system takes too much time from my normal duties. 2. Working with the system is so complicated, it is difficult to understand what is going on. 3. Using the system involves too much time doing mechanical operations (e.g., data input). 4. It takes too long to learn how to use the system to make it worth the effort.
<b>Ease of Use:</b> The degree to which using an innovation is perceived as being difficult to use.	1. My interaction with the system is clear and understandable. 2. I believe that it is easy to get the system to do what I want it to do. 3. Overall, I believe that the system is easy to use. 4. Learning to operate the system is easy for me.

<b>Table 3. Social Influence: Root Constructs, Definitions, and Scales</b>	
<b>Construct and Definition</b>	<b>Items</b>
<b>Subjective Norm:</b> The person’s perception that most people who are important to him think he should or should not perform the behavior in question.	<ol style="list-style-type: none"> <li>1. People who influence my behavior think that I should use the system.</li> <li>2. People who are important to me think that I should use the system.</li> </ol>
<b>Social Factors:</b> The individual’s internalization of the reference group’s subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations.	<ol style="list-style-type: none"> <li>1. I use the system because of the proportion of coworkers who use the system.</li> <li>2. The senior management of this business has been helpful in the use of the system.</li> <li>3. My supervisor is very supportive of the use of the system for my job.</li> <li>4. In general, the organization has supported the use of the system.</li> </ol>
<b>Image:</b> The degree to which use of an innovation is perceived to enhance one’s image or status in one’s social system.	<ol style="list-style-type: none"> <li>1. People in my organization who use the system have more prestige than those who do not.</li> <li>2. People in my organization who use the system have a high profile.</li> <li>3. Having the system is a status symbol in my organization.</li> </ol>

<b>Table 4. Facilitating Conditions: Root Constructs, Definitions and Scales</b>	
<b>Construct and Definition</b>	<b>Items</b>
<b>Perceived Behavioral Control:</b> Reflects perceptions of internal and external constraints on behavior and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions.	<ol style="list-style-type: none"> <li>1. I have control over using the system.</li> <li>2. I have the resources necessary to use the system.</li> <li>3. I have the knowledge necessary to use the system.</li> <li>4. Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system.</li> <li>5. The system is not compatible with other systems I use.</li> </ol>
<b>Facilitating Conditions:</b> Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support.	<ol style="list-style-type: none"> <li>1. Guidance was available to me in the selection of the system.</li> <li>2. Specialized instruction concerning the system was available to me.</li> <li>3. A specific person (or group) is available for assistance with system difficulties.</li> </ol>
<b>Compatibility:</b> The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters.	<ol style="list-style-type: none"> <li>1. Using the system is compatible with all aspects of my work.</li> <li>2. I think that using the system fits well with the way I like to work.</li> <li>3. Using the system fits into my work style.</li> </ol>

**Table 5. Attitude Toward Using Technology: Root Constructs, Definitions and Scales**

Construct and Definition	Items
<b>Attitude Toward Behavior:</b> An individual's positive or negative feelings about performing the target behavior.	<ol style="list-style-type: none"> <li>1. Using the system is a bad/good idea.</li> <li>2. Using the system is a foolish/wise idea.</li> <li>3. I dislike/like the idea of using the system.</li> <li>4. Using the system is unpleasant/pleasant.</li> </ol>
<b>Intrinsic Motivation:</b> The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se.	<ol style="list-style-type: none"> <li>1. I find using the system to be enjoyable</li> <li>2. The actual process of using the system is pleasant.</li> <li>3. I have fun using the system.</li> </ol>
<b>Affect Toward Use:</b> Feelings of joy, elation, or pleasure; or depression, disgust, displeasure, or hate associated by an individual with a particular act.	<ol style="list-style-type: none"> <li>1. The system makes work more interesting.</li> <li>2. Working with the system is fun.</li> <li>3. The system is okay for some jobs, but not the kind of job I want. (R)</li> </ol>
<b>Affect:</b> An individual's liking of the behavior.	<ol style="list-style-type: none"> <li>1. I like working with the system.</li> <li>2. I look forward to those aspects of my job that require me to use the system.</li> <li>3. Using the system is frustrating for me. (R)</li> <li>4. Once I start working on the system, I find it hard to stop.</li> <li>5. I get bored quickly when using the system. (R)</li> </ol>

## **Appendix I. Slides Used for Interviews**

(Slides start on next page)

# QQ GUI WALKTHROUGH



Register Account

Recover Password

# Main Window



Contacts

QQ Menu

Security

Personal Web



Groups

Settings

Hangouts



Logs

Logs

Search



- Send Instant Message
- Send Email
- Visit Qzone
- QQ VIP Settings
- Play Games
- Payment Settings
- Move to Category
- Delete
- Report
- Change Display Name
- More Settings
- Messages and Visibility
- Logs
- Check Information



- Tools
- Settings
- Updates
- Security
- Help
- Friend Administration
- Change Password
- Change User
- Lock
- Sign-out

# Instant Messaging



Close Send



玫瑰

Voyager 2013-03-22 22:24:04

我会在会上把在QQ群里回答问题和学生会跟国际生办事儿的规矩给大家解释一下

Voyager 2013-03-22 22:24:16

- 到时候大家要是有什么意见的话也可以互相谈谈
- 开会的时候主要是把规矩搞清楚，把所有事情谈清楚，周三下午开工

宋韵玫 2013-03-22 22:25:48

oki , got it

宋韵玫 2013-03-23 19:27:39

Hej, jag har börjat på en checklista för vad som ska göras och skickas ut under våren. Skulle vara bra om du kunde

Whiteboard

Share Music

History

消息记录

本地消息 漫游消息

Voyager 19:32:14

du kan göra det i browsern

玫瑰 19:32:32

found it

Voyager 19:32:29

och två, godkänn min förfrågan på QQ

Voyager 19:32:47

varje gång jag går in på den här QQ:n blir jag nedspammad av kineser som vill ha information

玫瑰 19:32:57

shadowcat?






Voyager 19:32:52

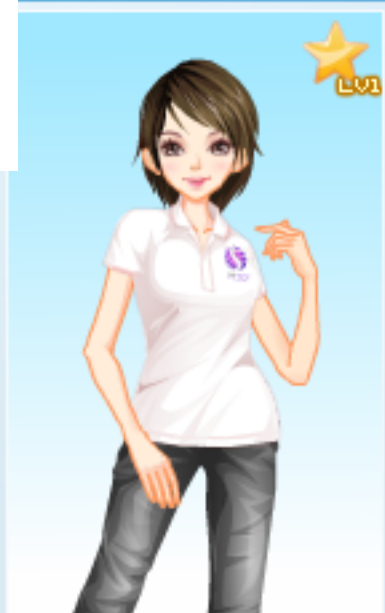
yes

玫瑰 19:33:28

done

查找 2013-3-23 第 23 页/23页

-  开始视频会话 Start Video Chat
-  邀请多人视频会话 Invite others for group video chat
-  发送视频留言 Record a video Message
-  视频设置 Video Settings
-  语音测试向导 Calibrate



shadowcat?  
Voyager 2013-03-23 19:32:52  
yes  
玫瑰 2013-03-23 19:33:28  
done

以上是历史消息

免费穿上 

时尚英伦风，个性推荐！  
更多免费QQ秀



玫瑰

开始语音会话 Start Audio Chat  
发起多人语音 Start Group Audio Chat  
语音设置 Audio Settings  
语音测试向导 Audio Calibration  
发送语音消息 Leave Audio Message

voyage  
我  
生  
Voyage  
· 到  
· 开会的时候主要是把规矩搞清楚，把所有事情谈清楚，周三下午开工  
宋韵玟 2013-03-22 22:25:48  
oki, got it  
宋韵玟 2013-03-23 19:27:39  
Hej, jag har börjat på en checklista för vad som ska göras och skickas ut under våren. Skulle vara bra om du kunde

消息记录

免费穿上  
时尚英伦风，个性推荐！  
更多免费QQ秀

关闭(C) 发送(S)

玫瑰

发送文件/文件夹 Send File or Folder  
 发送离线文件 Send Offline File  
 发送微云文件 Send Cloud File  
 传文件设置 File Transfer Settings

Voyager 2013  
 我会在会  
 生办事儿  
 Voyager 2013

- 到时候大家要是有什么意见的话也可以互相谈谈
- 开会的时候主要是把规矩搞清楚，把所有事情谈清楚，周三下午开工

宋韵玟 2013-03-22 22:25:48

oki , got it

宋韵玟 2013-03-23 19:27:39

Hej, jag har börjat på en checklista för vad som ska göras och skickas ut under våren. Skulle vara bra om du kunde

消息记录

关闭(C) 发送(S)

LV1

示好 使坏

免费穿上  
 时尚英伦风，个性推荐！  
 更多免费QQ秀

玫瑰

Send SMS  
Send Email  
Chat for free  
Search  
Tencent Video  
Pay  
Recommend Friends  
Delete  
Blacklist  
Report  
Add QQ Points

发送短信到对方手机, 点  
发送邮件  
手机免费聊QQ  
搜索  
腾讯视频  
财付通  
QQ装扮  
一起玩游戏  
给他推荐好友  
删除好友  
移至黑名单  
举报  
等级加速PK

该好友正在  
击查看详情  
QJ#P1  
宋韵玟 2013-03-22 22:18:06  
哦, 我们  
Voyager 2013  
我会在会  
生办事儿的规矩给大家解  
Voyager 2012.02.22 22:24:16  
· 至  
· 于  
· 查

LV1

免费穿上  
时尚英伦风, 个性推荐!  
更多免费QQ秀

关闭(C) 发送(S)

# Group Chat

**北欧华人天空论坛**  
(500人群) 生活休闲-同城

忧哉的黑驴(50753067) 17:30:34

- 呵呵，我做的不正宗
- 有时间你去东北吃的才过瘾
- 我做的肉不够大

啊啦吧吗(164247835) 17:35:07

我不奢求

忧哉的黑驴(50753067) 17:36:43

- 呵呵！多谢老力给面子
- 下次有机会再给你做

啊啦吧吗(164247835) 18:07:29

🤔

Notification Settings

群成员(24/100)

- milo(86722447)
- x.\_.故事、.(422479395)
- 十八公(1292456388)
- 沙滩海岸(1246667099)
- 米修米修(9911796)
- Aska(173927319)
- Elena(1537262573)
- Godis(272618110)
- sAbrinA <sabrina\_4769@hotmail.com>
- の亡命ろ <xuemeilan7410@163.com>
- 平平淡淡才是真(2227200115)
- 拒绝调戏(369101757)



- General Settings
- More settings
- Members
- My Contact Card
- Adm. Settings

**群设置 — Sthlm Intl Chn Students 2012 1**



更换图标

- 基本资料**
- 更多资料
- 群成员
- 群名片
- 群设置

名称: Sthlm Intl Chn Studer      群号: 176895650

备注: -      Own Nickname      等级: 皇冠

群内成员: 201人(上限500人)      创建时间: 2011-09-25

群主/管理员:


Moderators

群简介:

Presentation

群公告: 仅群内成员可见

请把名字改成“名字-学校专业”。请看群共享！  
 Topic

只能通过群号找到这个群      Only allow search by Group Number

确定
取消
应用

Ok

Cancel

Apply

群设置 — 皇家工学院 KTH 2010



更换图标

基本资料

更多资料

**群成员**

群名片

群设置

帐号	昵称	性别	最后发言
1194748281	VOY-计算机	男	2013-03-25
43308386	].[	男	2013-01-11
forward.li.kth...	Forward	男	2012-06-09
87504066	YY/yb	女	2011-03-20
523244531	桃桃	女	2012-04-14
274657058	米芽-EIG	女	2012-03-12
591723982	紫电-Nano	男	2012-02-24
845010300	***没人疼***	女	2011-05-02
454991055	/ybMomo	-	2013-01-10
416929981	/坏笑 午后抱枕	男	2012-12-16
5561574	【莫草凝露】	女	-
396242729	√バカ	男	2013-03-12
396741380	┆無綫┆	男	2011-05-25
258299683	♥阿瓜的逆袭	女	-

添加成员
删除成员
设置管理员
可设10个管理员(详情)

Add
Remove
Make Operator





# Log Viewer - People

The screenshot shows the QQ Message Manager (消息管理器) interface. The top bar includes navigation icons for '联系人' (Contacts), '群' (Groups), '讨论组' (Discussion Groups), '临时会话' (Temporary Sessions), '系统消息' (System Messages), '更多消息' (More Messages), '工具' (Tools), and '查找' (Search). The main area is divided into three sections: a left sidebar for contact lists, a middle column for group members, and a right pane for the chat log.

**Left Sidebar (Contact Lists):**

- 最近联系人(155)
- 我的好友(42)
- KTH 2010(113)
- KTH 2009(104)
- Chinese Organizations(2)
- Other People(23)
- Master 2009(3)
- 长春(56)
- SU Master 2010(9)
- Swedish-Chinese(2)
- SU交换(10)
- KTH 2011(68)
- 斯京2012(155)

**Middle Column (Group Members):**

- Memory
- 玫瑰
- 小鬼-环境
- Sollo
- 秋梧一曳
- 夜半鸟叫声
- 胡桃夹子
- hansey-NKU-Maths
- 晓东-成电-微电
- 樱桃小新
- 幻影5月痕
- 哥特Parternas Grand
- 果断逸

**Right Pane (Chat Log):**

本地消息记录

Voyager 22:31:49  
你如果认识斯大13届的学生就可以让他们加入这个群

Voyager 22:32:08  
今年我不会开Stockholm整个城市的群

Memory 22:36:39  
好的明白了

Memory 22:42:41  
交换生也算是吧

Voyager 22:43:13  
可以算到里面

Memory 22:43:34  
恩好

2013-03-24

Memory 00:13:32  
第六届汉语桥世界中学生中文比赛瑞典赛区比赛时间3.24周日下午一点在斯德哥尔摩大学Aula Magna举行!

2013-3-24 | 第 10 页/10页

# Log Viewer - Groups

消息管理器

联系人 群 讨论组 临时会话 系统消息 更多消息 工具 查找

我的QQ群(0)  
斯京华人组织(9)  
斯京学校(8)  
其他城市的学校(7)  
娱乐群(4)  
留学生交流群(5)  
已退出的群(14)

2011国家公派--瑞典  
2011瑞典皇家工学院  
KTH SoC&Math 2010  
kth/kista校区中国团  
KTH-CSC-2012  
KTH-CSC-2013  
Stockholm Uni. 2010  
瑞典-斯大2011

哦  
好的  
排名不知道  
这个无所谓其实  
写无可以吗?  
可以  
哦 好的 谢了

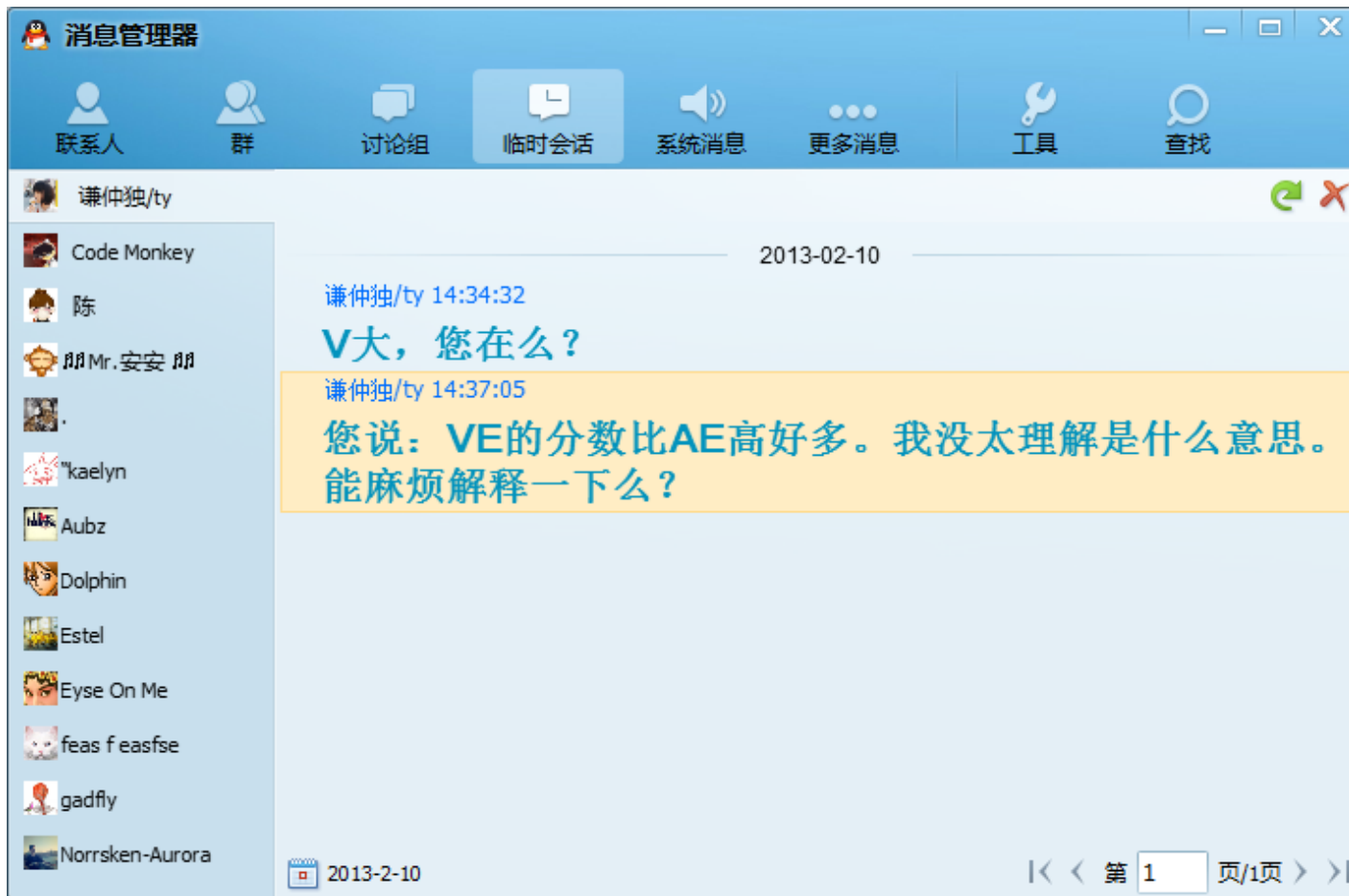
#kid-机械(371190927) 15:49:26  
#kid-机械(371190927) 15:49:39  
#田野-材料(275920220) 15:49:40  
#kid-机械(371190927) 15:49:41  
#田野-材料(275920220) 15:49:48  
#kid-机械(371190927) 15:49:54

2013-3-24 第 56 页/56页

# Log Viewer – Discussion Groups

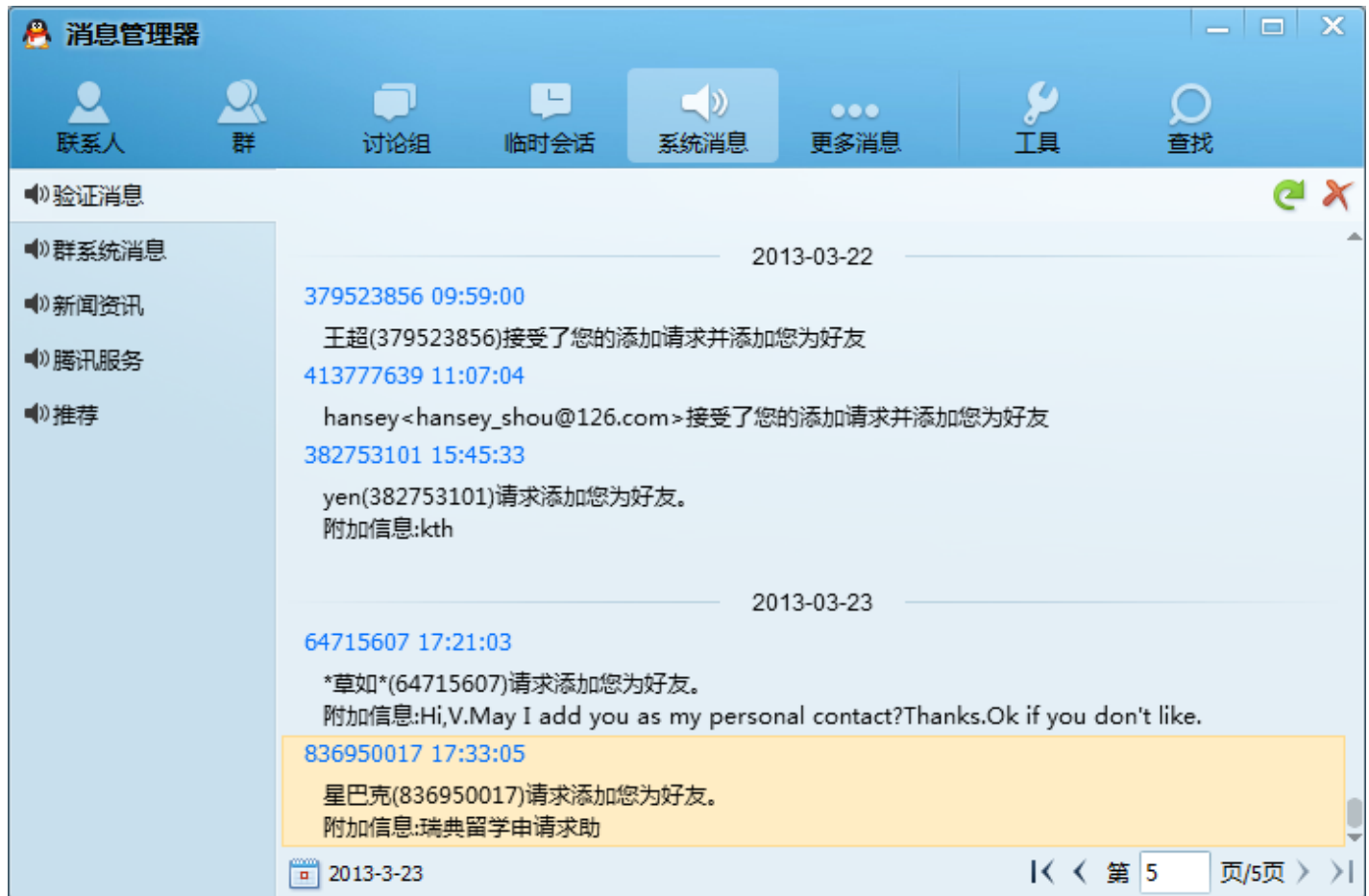


# Log Viewer – Temporary Conversations



# Log Viewer – System Notifications

Contacts  
Groups  
News  
Service  
Recommendations



The screenshot displays the QQ Message Manager (消息管理器) window. The interface is in Chinese and features a blue header bar with navigation icons for '联系人' (Contacts), '群' (Groups), '讨论组' (Discussion Groups), '临时会话' (Temporary Sessions), '系统消息' (System Messages), '更多消息' (More Messages), '工具' (Tools), and '查找' (Search). The '系统消息' (System Messages) tab is selected, showing a list of notifications. The notifications are organized by date, with a section for 2013-03-22 and another for 2013-03-23. The most recent notification, from 836950017, is highlighted in yellow. The interface also includes a left sidebar with categories like '验证消息' (Verification Messages), '群系统消息' (Group System Messages), '新闻资讯' (News), '腾讯服务' (Tencent Services), and '推荐' (Recommendations). A status bar at the bottom shows the date 2013-3-23 and page navigation controls.

消息管理器

联系人 群 讨论组 临时会话 系统消息 更多消息 工具 查找

验证消息

群系统消息

新闻资讯

腾讯服务

推荐

2013-03-22

379523856 09:59:00  
王超(379523856)接受了您的添加请求并添加您为好友

413777639 11:07:04  
hansey<hansey\_shou@126.com>接受了您的添加请求并添加您为好友

382753101 15:45:33  
yen(382753101)请求添加您为好友。  
附加信息:kth

2013-03-23

64715607 17:21:03  
\*草如\*(64715607)请求添加您为好友。  
附加信息:Hi,V.May I add you as my personal contact?Thanks.Ok if you don't like.

836950017 17:33:05  
星巴克(836950017)请求添加您为好友。  
附加信息:瑞典留学申请求助

2013-3-23 第 5 页/5页

# General Settings

Logon  
Main Window  
Status  
Instant Messaging  
Notifications  
Reminders  
Hotkeys  
Sound  
Update  
File Send/Receive  
Audio and Video



# Security Settings

Password  
QQ Lock  
Message Logs  
Security Recomm.  
File Security





# Privacy Settings

Personal Information  
Visibility  
Visibility cont...  
Winks  
Temp. Conversations  
Personal Status



The screenshot shows the 'System Settings' (系统设置) window with the 'Permissions' (权限设置) tab selected. The left sidebar lists various settings categories, with 'Circle Permissions' (圈子权限) highlighted. The main content area is divided into three sections: 'Personal Information' (个人资料), 'Circle Permissions' (圈子权限), and 'Anti-harassment' (防骚扰).

**个人资料:** 您可以设置谁可以查看您的个人资料。  
[权限设置]

**圈子权限:** QQ圈子里谁能看到我/我能看见谁 *Who using QQ can see me*  
Everyone  圈中所有人  仅QQ好友 *Only my friends*

QQ圈子里别人能看见我的/我能看见别人的称呼是  
 圈内备注  QQ昵称

圈子里谁能看到我的QQ签名动态 *Who can see my QQ status message*  
 圈中所有人  仅QQ好友  都不能

接收来自圈子的消息提醒 *No one*  
 不使用圈子 [开通圈子>>>](#)

**防骚扰:** 请选择允许别人查找到您的方式: *How can people search for me*  
 通过查找视频用户列表找到我 *From a list*  
 只能通过帐号或昵称找到我 *From QQ number only*

## **Appendix II. Questionnaire used for Interviews**

(Questionnaire starts on next page)

# UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY

## General Information

1. Gender:

Male    Female

2. Age:

21    22    23    24    25    26    27    28    29    30

3. Study Program:

4. Ethnically Chinese:

No    1    2    3    4    5    6    7

5. Culturally Chinese:

No    1    2    3    4    5    6    7

6. Chinese Proficiency:

0    1    2    3    4    5    6    7

## Perceived Usefulness

1. Using the system in my job would enable me to accomplish tasks more quickly

n/a    1    2    3    4    5    6    7

2. Using the system would improve my job performance.

n/a    1    2    3    4    5    6    7

3. Using the system in my job would increase my productivity.

n/a    1    2    3    4    5    6    7

4. Using the system would enhance my effectiveness on the job.

n/a    1    2    3    4    5    6    7

5. Using the system would make it easier to do my job.

n/a    1    2    3    4    5    6    7

6. I would find the system useful in my job.

n/a    1    2    3    4    5    6    7

## Extrinsic Motivation

1. Using the system in my job would enable me to accomplish tasks more quickly

n/a 1 2 3 4 5 6 7

2. Using the system would improve my job performance.

n/a 1 2 3 4 5 6 7

3. Using the system in my job would increase my productivity.

n/a 1 2 3 4 5 6 7

4. Using the system would enhance my effectiveness on the job.

n/a 1 2 3 4 5 6 7

5. Using the system would make it easier to do my job.

n/a 1 2 3 4 5 6 7

6. I would find the system useful in my job.

n/a 1 2 3 4 5 6 7

## Job-fit

1. Use of the system will have no effect on the performance of my job (reverse scored).

n/a 1 2 3 4 5 6 7

2. Use of the system can decrease the time needed for my important job responsibilities.

n/a 1 2 3 4 5 6 7

3. Use of the system can significantly increase the quality of output on my job.

n/a 1 2 3 4 5 6 7

4. Use of the system can increase the effectiveness of performing job tasks.

n/a 1 2 3 4 5 6 7

5. Use can increase the quantity of output for the same amount of effort.

n/a 1 2 3 4 5 6 7

6. Considering all tasks, the general extent to which use of the system could assist on the job. (different scale used for this item).

n/a 1 2 3 4 5 6 7 8 9 10

## Relative Advantage

1. Using the system enables me to accomplish tasks more quickly.  
n/a    1    2    3    4    5    6    7
2. Using the system improves the quality of the work I do.  
n/a    1    2    3    4    5    6    7
3. Using the system makes it easier to do my job.  
n/a    1    2    3    4    5    6    7
4. Using the system enhances my effectiveness on the job.  
n/a    1    2    3    4    5    6    7
5. Using the system increases my productivity.  
n/a    1    2    3    4    5    6    7

## Outcome Expectations

1. I will increase my effectiveness on the job.  
n/a    1    2    3    4    5    6    7
2. I will spend less time on routine job tasks.  
n/a    1    2    3    4    5    6    7
3. I will increase the quality of output of my job.  
n/a    1    2    3    4    5    6    7
4. I will increase the quantity of output for the same amount of effort.  
n/a    1    2    3    4    5    6    7
5. My coworkers will perceive me as competent.  
n/a    1    2    3    4    5    6    7
6. I will increase my chances of obtaining a promotion.  
n/a    1    2    3    4    5    6    7
7. I will increase my chances of getting a raise.  
n/a    1    2    3    4    5    6    7

### Perceived Ease of Use

1. Learning to operate the system would be easy for me.  
n/a    1    2    3    4    5    6    7
2. I would find it easy to get the system to do what I want it to do.  
n/a    1    2    3    4    5    6    7
3. My interaction with the system would be clear and understandable.  
n/a    1    2    3    4    5    6    7
4. I would find the system to be flexible to interact with.  
n/a    1    2    3    4    5    6    7
5. It would be easy for me to become skillful at using the system.  
n/a    1    2    3    4    5    6    7
6. I would find the system easy to use.  
n/a    1    2    3    4    5    6    7

### Complexity

1. Using the system takes too much time from my normal duties.  
n/a    1    2    3    4    5    6    7
2. Working with the system is so complicated it is difficult to understand what is going on.  
n/a    1    2    3    4    5    6    7
3. Using the system involves too much time doing mechanical operations (e.g., data input).  
n/a    1    2    3    4    5    6    7
4. It takes too long to learn how to use the system to make it worth the effort.  
n/a    1    2    3    4    5    6    7

### Ease of Use

1. My interaction with the system is clear and understandable.  
n/a    1    2    3    4    5    6    7
2. I believe that it is easy to get the system to do what I want it to do.  
n/a    1    2    3    4    5    6    7
3. Overall, I believe that the system is easy to use.  
n/a    1    2    3    4    5    6    7
4. Learning to operate the system is easy for me.  
n/a    1    2    3    4    5    6    7

## Subjective Norm

1. People who influence my behavior think that I should use the system.

n/a 1 2 3 4 5 6 7

2. People who are important to me think that I should use the system.

n/a 1 2 3 4 5 6 7

## Social Factors

1. I use the system because of the proportion of coworkers who use the system.

n/a 1 2 3 4 5 6 7

2. The senior management of this business has been helpful in the use of the system.

n/a 1 2 3 4 5 6 7

3. My supervisor is very supportive of the use of the system for my job.

n/a 1 2 3 4 5 6 7

4. In general, the organization has supported the use of the system.

n/a 1 2 3 4 5 6 7

## Image

1. People in my organization who use the system have more prestige than those who do not.

n/a 1 2 3 4 5 6 7

2. People in my organization who use the system have a high profile.

n/a 1 2 3 4 5 6 7

3. Having the system is a status symbol in my organization.

n/a 1 2 3 4 5 6 7

## Perceived Behavioral Control

1. I have control over using the system.

n/a 1 2 3 4 5 6 7

2. I have the resources necessary to use the system.

n/a 1 2 3 4 5 6 7

3. I have the knowledge necessary to use the system.

n/a 1 2 3 4 5 6 7

4. Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system.

n/a 1 2 3 4 5 6 7

5. The system is not compatible with other systems I use.

n/a 1 2 3 4 5 6 7

## Facilitating Conditions

1. Guidance was available to me in the selection of the system.

n/a    1    2    3    4    5    6    7

2. Specialized instruction concerning the system was available to me.

n/a    1    2    3    4    5    6    7

3. A specific person (or group) is available for assistance with system difficulties.

n/a    1    2    3    4    5    6    7

## Compatibility

1. Using the system is compatible with all aspects of my work.

n/a    1    2    3    4    5    6    7

2. I think that using the system fits well with the way I like to work.

n/a    1    2    3    4    5    6    7

3. Using the system fits into my work style.

n/a    1    2    3    4    5    6    7

## Finishing Comments