1 Overview

This handout is intended to provide explicit instructions for creating an ethical argument using the Software Engineering Code of Ethics. A general overview is as follows.

1. **Facts:** Introduce the domain and relevant information.

2. **Ethical Question:** From these facts, an ethical question should logically follow and be asked.

3. **Find SE Code Rules:** With this focused ethical question, find all SE Code rules which apply. After you have chosen the applicable rules, choose a few which most strongly apply. These rules will be the basis for your analysis.

4. **Apply the Rules:** Break down each SE Code rule into its phrases and replace the phrases with the equivalent domain specific phrase. With all phrases substituted, show how the modified rule was or was not followed using the aforementioned facts.

5. **Conclude:** Once you have shown whether the particular SE Code rules were or were not followed, conclude by summarizing the results and answering your ethical question. Your conclusion should logically flow from your analysis.

This handout will now go further into each of these steps with more explanation and an example. This example is based on an incident where CVS Pharmacy gave private patient data to a third party.

**Note:** Dr. Turner appreciates the use of \LaTeX to write your papers. \LaTeX is a great skill to have which will make your resulting paper look more consistent and professional.

2 Facts

In order for your audience to understand your analysis, you must introduce the facts you plan to use in your argument. Do not include more facts than are needed for comprehension since they will distract your reader.

2.1 Facts Example

CVS is a drug store and pharmacy which fills medical prescriptions written by authorized medical professionals.[7] In order to help people stay current with their prescriptions, CVS management decided to send out reminders to all of its patients. CVS, however, did not have the necessary technology to send reminders efficiently themselves. A direct mail marketing company named Elensys had the technical ability. CVS therefore contracted with Elensys to provide direct mail reminders for patients who would likely forget to renew their prescriptions.[12]

To more accurately target forgetful patients, CVS gave Elensys all of its patients’ prescription information for Data Mining purposes. This transfer of patient data has caused much controversy since CVS patients did not sign an agreement for CVS to release their data to a third party.[2] CVS patients additionally were not notified that CVS was sending reminders.[8] Fur-
thermore, this patient data was not anonymized meaning that patient names and other personal information was available to anyone who viewed the data.[6] This incident is currently in litigation in a Massachusetts court as the case “Weld and Kelly v. CVS Pharmacy, Inc., Elensys, and Glaxo Wellcome, et al.”[11]

3 Research Question

In order to focus your writing, you need to have a single “yes or no” question to answer. This question should follow from the natural progression of your facts. That is after the reader finishes your facts section, they should be asking to themselves your research question.

3.1 Research Question Example

“Was it ethical for CVS and Elensys to transfer patient information for the purpose of efficiently sending prescription reminders?”

4 SE Code Analysis

One of the best ways to analyze the ethics of an action performed by a software related entity is to use the Software Engineering Code of Ethics. The SE Code is the professional standard adopted by both ACM and IEEE to govern members of the Software Engineering profession.

Before you start your actual analysis, you must first state why the SE Code can be used to evaluate the entities in your question. This means that the participants involved must deal with software in some way. The example analysis quotes the SE Code’s description of all possible individuals included under its domain.

Once the readers have seen the applicability of the SE Code to the entities in your question, you can start your analysis. Each main SE Code rule should be analyzed separately, but similar rules can be ordered together for readability.

To make a strong case that the parties involved followed or did not follow a SE Code rule, the rule must be broken down into its phrases. These phrases must then be replaced by their equivalent meaning as applied to your question. This results in a modified SE Code rule which applies to your particular domain. The final step is to use this modified SE Code rule and your facts to come to an ethical answer. This substitution process can be seen twice in the example.

4.1 SE Code Analysis Example

In order to determine whether or not CVS and Elensys were ethical, this paper will apply the Software Engineering Code of Ethics[9]. Since the SE Code technically only applies to Software Engineering professionals, CVS and Elensys must first be considered professionals under the SE Code’s definition. The SE Code states that it applies to

“ professional software engineers, including practitioners, educators, managers, supervisors and policy makers, as well as trainees and students of the profession.”[9]

Elensys is included by this definition since they directly developed Data Mining software making them “professional software engineers.” CVS, however, is not directly a software development company. CVS does maintain the database of all its patients making them “practitioners” and therefore required to abide by the SE Code. Now that it has been shown that the SE Code applies
to both entities, the SE Code can be used to judge the ethics of CVS’ and Elensys’ actions.

The first SE Code rule that is applicable is 2.03 which states

SE Code 2.03: Use the property of a client ... only in ways properly authorized, and with the client’s ... knowledge and consent.[9]

SE Code 2.03 deals with using the property of a client in an authorized manner. Specifically the “client” in this case refers to the CVS patients and their “property” is their confidential information. The phrase “properly authorized” requires that the patients have previously signed paperwork giving CVS the authority to share their medical information with a third party.[1] The use of patient information must further be used with both “the client’s knowledge” which means the patient is aware that their data is being used to send reminders as well as “the client’s consent” which is the approval given by the patients after they know the intended use of their data.

After the appropriate substitutions, SE Code 2.03 reads

Substituted SE Code 2.03: Use the CVS patient data ... only in ways properly authorized, and with the CVS patients’ ... knowledge and approval of the data transfer to Elensys.

CVS and Elensys did none of the previously mentioned requirements to ethically transfer patient data under SE Code 2.03. As was stated in the facts, patients did not give CVS prior authorization to share their information with a third party such as Elensys. There was no “client knowledge” as CVS did not notify their patients that they were planning to give their data to Elensys. Furthermore, since CVS patients were not informed, they could not give their consent. Since CVS patients did not authorize, know or consent to this data transfer, CVS and Elensys are in violation of SE Code 2.03 which makes their actions unethical.

SE Code 2.03: Authorized Use
CVS’ and Elensys’ Actions: Unethical

The second SE Code rule that applies is 3.12 which states

SE Code 3.12: Work to develop software and related documents that respect the privacy of those who will be affected by that software.[9]

We again break this rule into its parts. “Develop software” in this case refers to the creation of the prescription reminder system. This system will affect the CVS patients so “those who will be affected by that software” refers to the CVS patients. The “privacy” of the CVS patients equates to their provided medical data and to “respect” that private medical data means to make an effort to protect it.[10]

After these substitutions SE Code 3.12 states

Substituted SE Code 3.12: Work to create a reminder system ... that makes an effort to protect the confidential medical data of CVS patients.

The answer to this rule depends on whether CVS and Elensys “respected” the patients’ private data. A minimal approach to “making an effort to protect” the confidential data would be to look at the current research to see if any work already exists to anonymize data for security purposes. Since such anonymization
technologies did exist at that time[4, 5, 3], it can be argued that CVS and Elensys did not investigate the current research and therefore did not respect the patients’ data. Therefore CVS and Elensys are in violation of SE Code 3.12 which makes their actions unethical.

| SE Code 3.12: Respect Privacy |
| CVS’ and Elensys’ Actions: Unethical |

5 Conclusion

The conclusion is a summary of your entire analysis. It should reiterate the answer your audience has been forming while reading your analysis. New information should never be introduced in your conclusion.

5.1 Conclusion Example

Many different SE Code rules have been examined throughout this paper to determine whether or not CVS’ and Elensys’ actions were ethical. Table 1 summarizes the results.

<table>
<thead>
<tr>
<th>SE Code Rule</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE Code 2.03</td>
<td>Unethical</td>
</tr>
<tr>
<td>SE Code 3.12</td>
<td>Unethical</td>
</tr>
<tr>
<td>Final Conclusion</td>
<td>Unethical</td>
</tr>
</tbody>
</table>

Table 1: Summary of Ethical Results

As Table 1 shows, all of the applicable SE Code rules have been violated. Therefore this paper concludes that CVS and Elensys acted unethically.

6 Bibliography

Always make sure to cite the sources of your facts. You may have a great analysis but unless you cite the facts, the foundation of your argument is flawed. Those arguing against your position will simply state, “Yes your argument is logically based on the facts you have stated, but how can I be sure you did not just make them up?” This, however, could all be avoided by taking a few notes when doing your background research and including them in your paper.

Additionally, your argument will be stronger if you cite many different sources as oppose to just a few. The more sources you have cited, the more convinced your readers will be that you have conducted thorough background research.

References


[8] NB Finn and WF Bria. Keeping Health Information Away from Prying Eyes.


