University of Toronto Scarborough, Department of Computer And Mathematical Sciences
CSCD03—Social Impact of Information Technology, Winter 2021

Assignment 1: Professional Ethics

Your paper must be submitted as a pdf, MS word or rich text document. With the filename
`Lastname_Firstname_A1.xxx` with your name and the appropriate file extension type.

1. Ethical Advice

Med-E-Clinic Systems is a Toronto-based company with 20 employees, specializing in software for the management of medical clinics. The company's main product, Med-E-Clinic, manages patient appointments, organizes medical records, schedules staff time, and handles billing to provincial or private payers. The software is complex and sophisticated, and costs up to $10,000 per installation, depending on the size and complexity of the individual set-up.

The program usually requires some customization for each customer. So a sale means that some of the programming staff have to go on-site to set the system up for specific aspects of the clinic in which it will operate. Generally, the staff look forward to these trips; often, they visit interesting places, and arrange to spend an extra day or two away as a holiday.

Although the company used to be profitable, sales have been slow recently because of fierce competition from another company, Klin-E-Kal Systems, which last year started selling a similar, but inferior, program at a somewhat lower price. Last year's revenue was just under $2 million—not quite enough to cover the company's operating costs. This is the second consecutive year that the company has lost money, and if it doesn't turn things around fast, the accumulated deficit will become too great and the company could be forced into bankruptcy.

So it was good news when the president, Sandra Andras, announced at the weekly meeting of senior staff that eight new orders had been received in the previous week. The purpose of the meeting was to consider the customization work that would be needed for each sale, and assign members of the staff to work with each new client. Trouble arose, however, when the staff found out that two of the new clients were not their usual kind of customer.

"An abortion clinic!" exclaimed Sam. "That's wholly unethical. We mustn't have anything to do with them!"

"I'm not sure that we can afford to just knock back their order," said Sandra. "Anyway, if we don't sell them Med-E-Clinic, they'll just go to Klin-E-Kal Systems instead. We'll miss out on a desperately needed sale, and the end result will be exactly the same. What's more, Sam, since you've been saying that you are entitled to a holiday after your long hours on the Dunklings project last month, I had thought that you would be the person who'd go to Halifax to install it. And then you could stay on for a few days for a holiday."

"There's no way I'm going near the place," said Sam, "even if you threaten to fire me. And I'm sure everyone else feels the same way."

"I think a woman has a right to choose!" exclaimed Cheryl. "My body is my own!"

"You baby-killer!" snarled Sam.

"Order!" shouted Sandra. "Sam, you will apologize for that. I think we should sell to this client, and Cheryl can go to Halifax for the installation.

"Now," she continued, "the next new client is a homeopathic medicine clinic in Toronto. Since Sam's not going to Halifax, he can do this installation instead."

"No way!" exclaimed Cheryl. "Homeopathy is a completely unscientific fraud. It's just a placebo. It's no different from astrology and fortune-telling. We mustn't do anything that would promote it."

"I'm not very happy about it either," said Sandra, "but we need every single one of these orders if we are to survive."

"I can't believe this!" cried Sam. "You're willing to turn a blind eye to the baby-killers, but you get all upset about people who don't toe the line with your rigid preconceived ideas about science."

The meeting went downhill from there.

Later, alone in her office, Sandra mulled over what had happened at the meeting. Sam's reaction had got her really worried. Med-E-Clinic Systems really needed every sale it could get. She knew that abortion is fully legal in Canada, but many people were strongly opposed to it and she wouldn't want it to be widely known that this clinic was one of the company's customers.

And now Cheryl had got her worried about homeopathy as well. She had said that homeopathy has been completely discredited by science, and that people who get homeopathic treatments instead of conventional medicine often suffer greater illness as a result. But Sam pointed out that homeopathy is regulated by Health Canada, and you can buy homeopathic remedies at natural food stores and many supermarkets; if that's okay, why shouldn't Med-E-Clinic sell its software to a homeopathic clinic?

Meanwhile, Sam visited Cheryl in her office.

"I'm so mad at you that I'm not talking to you," said Cheryl.

"Just listen," said Sam. "I have an idea that will make both of us happy. Remember that bug that Med-E-Clinic had in the beta version last year, where some records would get wrongly posted and some invoices wouldn't be sent out? Well, it seems to me that if this homeopathic clinic 'accidentally' got a version installed that just happened to have that bug in it, then their business wouldn't work properly, they wouldn't even be able to tell exactly why things were going wrong, and they might even be bankrupt in a few months."

"That would make me happy," said Cheryl, "but why would you want to do that?"

"Because the same 'accident' could happen to the abortion clinic when you install their software," said Sam. "Then we'd both be happy."

Cheryl didn't know what to say . . .

Your task

Sam, Cheryl, and Sandra all need some ethical and practical help asap! Advise each of them, in 500 words or more altogether. Your response should include a separate section for each of the three. You'll need to consider both professional and general ethics, and to also use your common sense and general knowledge.

In thinking about the problems here, you should consider the following points: Who are the stakeholders? What is the central dilemma for each character? What are the potential harms and benefits, rights and duties, etc? How do professional codes of ethics apply here?

Hint: Your personal opinions about abortion and homeopathy are not relevant to this assignment.

2. Report on a Software Disaster

Investigate a real world software based disaster that resulted in injury or death to one or more people, or a significant financial loss, or exposure of sensitive data. In 500 words or more, describe the disaster (briefly, don't spend more than 200 words on this), and explain what mistakes, errors, lapses or malicious actions (if any) of the software professionals involved led to the disaster.

How to get started:

There are plenty of well documented cases, some of which we've covered in class that can be found online. The difficulty will be in finding sources with appropriate detail for analysis by a computer scientist. You don't need to know exactly what went wrong with the code itself (most code is proprietary and not released even after an enquiry), but you should at least be able to get enough detail to comment on how it could have been avoided.

Some example disasters you could use:

- North American blackout of 2003

- Knight Capital stock trading disaster

- Ariane rocket explosion

- Mt. Gox Bitcoin hack

- Heathrow Terminal 5 Baggage System

- Telangana exam result suicides