CS Capstone - Problem Statement Draft Assignment

One of the first steps in developing a computer program is to determine and articulate the need for the program. Following the initial brainstorming session where program ideas are conceived, a clear and concise problem statement must be formulated. The problem statement can then become an aid and/or guide to the creative process and problem solving that follows.

A problem statement often touches on the 5 w's (who, what, where, when, why) of the problem. In other words, where and when does the problem occur, who or what does it affect, and how does it affect them. Here is some more information regarding each of these initial questions:

- Who does the problem affect? Specific groups, organizations, customers, etc
- What are the boundaries of the problem, e.g. organizational, workflow, geographic, student segments, etc.
- What is the issue? What is the impact of the issue? What impact is the issue causing? What will happen when it is fixed? What would happen if we didn't solve the problem?
- When does the issue occur? When does it need to be fixed?
- Where is the issue occurring? Only in certain locations, processes, products, etc?
- Why is it important that we fix the problem? What impact does it have on the business or customer? What impact does it have on all stakeholders, e.g. employees, students, administration, etc.

Each of the answers will help to zero in on the specific issue(s) and frame the problem statement. Your problem statement should be solvable. That is, it should take a reasonable amount of time to formulate, try and deploy a potential solution.

-from "How to Write a Problem Statement" www.ceptara.com

The process of writing problem statements often happens in two phases.

- Phase 1 - Write down the problem in the current state. Then, look at the above questions to make sure that each of them are appropriately addressed and revise your statement.
- Phase 2 is about the vision. What does the ideal solution look like? Once that is identified, again make sure that each question is appropriately addressed and revise. Be sure to discuss possible delivery platforms. In other words, briefly answer How?

These results are then put into the formal format which is a combination of three statements.

- Statement 1 – The ideal Scenario. Describe the goals, desired state, and/or the values that your audience considers important and that are relevant to the problem.
- Statement 2 – The Reality – Describe a condition that prevents the goal, state or value discussed in statement 1 from being achieved at the present time.
- Statement 3 – The Consequences – Using specific details, show how the situation in statement 2 contains little promise of improvement unless something is done. Then, project the consequences of possible solutions (platform implementations).

-from Christine McMullen, Penn State University (http://www.personal.psu.edu/cvm115/index.htm)

Example 1: Consider a software development and hosted data services company that supplies products and services to wireless carriers. They had issues deploying new software releases into the production environment. Deployment in this case is the word necessary to taking a production ready binary and installing, testing and releasing it into the production environment. The company failed to deploy the releases on-schedule over 50% of the time.

We want all of our software releases to go to production seamlessly, without defects, where everyone is aware and informed of the outcomes and status.

Today, we have too many release failures that result in too many rollback failures. If we ignore this problem; resources will need to increase to handle the cascading problems, and we may miss critical customer deadlines which could result in lost revenue, lost business, and further damage to our quality reputation.

We will use out Kaizen Blitz methodology in evaluating the last release to help us improve our processes.

Example 2:Consider a university level professor of Immunology that does not have an adequate lab. She is trying to teach students about organisms and interactions in the body using 2D, static overhead slides.

A "Virtual Immunology" laboratory would allow students to interact and experiment with organisms in realistic, organic environment.

Currently, Dr. Cundell's students are having trouble grasping key concepts in her class. Research has shown that students learn better when they are involved, but there is no lab facility to allow the students to experiment and interact with the course material. Immunology students are trying to study 3D, interactive, chemical and biological interactions by looking at 2D, static media with verbal descriptions of said interactions.

We propose the creation of a virtual laboratory. This laboratory will involve instruction and interaction through a web interface, allowing all students access from anywhere. The labs will also include 3D animations to help students visualize what the interactions in the human body actually look like.

You can read more at the following links:

- http://www.ceptara.com/blog/how-to-write-problem-statement
- https://www.mural.co/blog/problem-statements

Assignment: Write a problem statement for the problem we are discussing. This is a graded assignment. Each statement should be professional in appearance, thorough and clear. No typos, spelling errors or grammatical errors will be accepted. Points will be deducted for informal language, spelling errors, and grammatical errors.