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INTRODUCTION

When I was learning the JAVA programming language, while attending my Information Technology (IT) Class in secondary school one day, my instructor asked us to “write a program to calculate simple interest for a user-specified principal amount, interest rate and time period.” This task made me think about developing software for bank officers—with many other options—including loan management, account management, and other banking activities.

From this moment, I started thinking from a customer/user-oriented perspective, considering how software I developed could help the whole organization manage tasks more efficiently and smoothly. During my final examinations, I developed a JAVA-based software prototype called “E-Banking,” for such users as bank officers, account holders and bank managers. My project turned out to be the best one of my entire class.

As I entered my final year of secondary school, I was excited to develop an Android application—but I didn’t even know where to start. However, I am a fast learner, and thanks to the Internet, I learned to write Android applications in six months. I was then able to successfully devote my summer internship at the university to writing JAVA-based, Android apps.

Taking a step back, you will recall that the first step of any research or product development project is the problem statement. The second step is choosing the right teammates and technology. After finalizing the team structure and dividing the project into phases, you are good to go with researching whether the idea already exists. If it does, you can discover whether there are parameters or features missing, that you could introduce. After that, if you have everything in hand, you can proceed to hands-on development of a prototype—that helps you to learn more about the problem, and discover any initial development mistakes or concerns. Once the prototype, or semi-finished product is ready, you can secure intellectual property rights, by publishing research papers, or even applying for a patent. By going through this process, you can ensure you are ready to develop the prototype into a final product.

I feel it is very important for students around the world, studying in secondary schools and universities, to understand the process of transforming an idea into a product. This book is my way of laying out the process of what should be done to take an early idea, and transform it into a product. Learning and research are the key ingredients.

This book contains a series of simple processes (learning, research and key notions) that you should consider following—to take your initial idea, and make it into a full product.

So why wait? Let's get started on this awesome journey of researching ideas and problems!

DETERMINING PROBLEM STATEMENTS AND SOLUTIONS

Have you ever been frustrated at having to wait in long lines at fast food places, like McDonald's or KFC? And have you ever wondered how you could solve this problem?

Further, have you ever thought of some solution to it? This particular problem affects lots of people.

In the same way, you have probably encountered other problems or issues with shopping, public transportation, etc. These instances are examples of how to form a problem statement, as the first step to solving the problem.

In addition to forming your problem statement, there's the concept of the Five Ws—questions you should answer when finding or solving a problem. The five questions are:

- **Who:** Who is using the current model?
- **What:** What is the application or usage of the current model?
- **When:** When is the best time to bring your solution to market?
- **Where:** Where should your solution be deployed?
- **Why:** Why is the current approach not suitable today?

Once you have answered these five questions, you can loop in How questions. Some of them might include:

- **How** has this problem occurred?
- **How** can I solve this problem using my current knowledge and understanding?
- **How** should I proceed? And many other similar questions...

So, a good definition of a Problem Statement is: