Commencement Address - University of Pretoria, April 12, 2011
Building the Information Age

I want to start by thanking all of those involved for honoring me with this doctorate. In a sense, it's unfair that I should get such an honor at this time, because my wife, Susan, who is here with me today, just finished spending more than 10 years working on and completing her Ph.D., and here I get one having put in no additional effort. She agreed to forgive me in exchange for the trip to South Africa, and the safari park visit we start tomorrow.

I also want to thank and congratulate all of the students and their parents and families here today, as well as those who couldn't make it. It's one of the great accomplishments of life to graduate from a University program. Some of you have another distinction that is to be noted and praised as well. You are the first in your family to have achieved this level of education. For those of you with this distinction, I would like you to think for a moment about that. Since the dawn of time, nobody in your family history has ever achieved this level of academic advancement. None of your parents, their parents, or any of your ancestors, throughout all time, have ever achieved what you have achieved here today. Just think for a moment about how stunning that is as an achievement!

A university education is a great personal accomplishment for anyone, and it is one of the great accomplishments of humankind that we have such institutions of higher learning.

More than 35 universities have now been continuously operating for more than 500 years, and as accomplishments go, that's pretty stunning. You are all now part of an

educational system that was started about 1,000 years ago when the first of the still existing universities were created. You are part of the continuous growth of seedlings that were planted about 50 generations ago, and hopefully, your progeny will stand in a place like this in another 50 generations and listen to someone else say more or less the same thing but with bigger numbers.

As the universities grew, so did our civilization. In fact, I will go a step further. It is my view that the reason civilization continues to grow is because universities exist and produce people, like yourselves, who build things that work and that last. And that's what I am really here today to talk about. Building things help humanity last and grow and prosper.

The information sciences, and in that I include computer science, the management sciences associated with information and information technology, library science, and related areas, are also part of a long legacy. From the day the first cave person drew a picture on a cave wall, information in documentary form became a part of human existence, and it separated human beings from essentially all other creatures, who communicate only by things of the moment. The ability to transfer information unaltered over time led to systems of records that ultimately ended up making societies of more than a family group or small tribe possible. Indeed the transfer of information over time made science itself possible. Archival science has existed in one form or another for millennia, and since 1158, the principles of the Justinian code for public records have been taught in the legal educational systems based on common law worldwide. The science of diplomatics was formed, largely to prove ownership of land, and has been the basis for making legal determination about ownership from the 1500s until... just recently.

At the dawn of the agrarian age, people moved from hunter gatherers to growing food and protecting land. We still had and have hunters and gatherers, but they are now few and far between in the World as a whole. People built things – farms – villages – and lives for themselves and their families. And for millennia there was a social contract. Farmers grew food, cobblers cobbled shoes, wheelwrights made wheels for carts, and each was able to earn a living in the exchange, so that all shared in the bounty of the group as a whole. The social contract was broken from time to time, and wars and insurrection resulted.

At the dawn of the industrial age, people went from individuals or small groups working as skilled artisans, largely in workshops right next to where they lived, to large groups of people with special skills brought together to form industrial capacity working as specialized groups, moving large volumes of goods long distances and allowing the production of everything from cities to highways, all because of the economies of scale, technological advances, and specialization. People built things – buildings – factories – cities – transportation. And there was a new social contract. The social contract of the industrial age was broken early on when the "robber barons" took too much, when the investment class created a bubble, and the workers who worked in the factories making the goods that the elites consumed suffered as a result. But such a broken contract cannot last long without revolution or intense oppression.

The agrarian age is still with us, and without the ability to grow food we would certainly not survive, but hunting, gathering, and food production have largely moved into the industrial age on a global basis as well. The industrial age is still with us, and

must remain with us for some time if the societies we have built are to exist and prosper.

Here we are at the dawn of the information age. And here you are, graduating in fields that study information and information technology and how to build things in this new age. If we can form and keep a viable social contract for the information age, you will spend your lives building the things that fulfill that social contract and move humanity to the next age of its existence. It is truly an exciting time to be alive, as humanity enters the new golden age, the age of global enlightenment that is already well beyond anything ever imagined only a few hundred years ago. You will live longer, healthier lives than anyone ever lived before, and the average lifestyle of your generation and your children will far exceed anything ever attained by any king or queen only 100 years ago. If...

In the middle of that last description I mentioned something that should not really be glossed over. The "viable social contract for the information age". For thousands of years, there was a system in place that allowed property ownership to be legally demonstrated. It was based on diplomatics and archival science, and it has largely been swept away in the emergence of the information age. That's a major part of the reason there is a financial crisis in the world today. And there are other similar problems waiting to emerge. The reason is that we don't have the social contract of the information age worked out yet, and the technology is not being used so as to meet that yet to be developed contract.

When the Soviet Union was at its height of power, there was a notion bandied about in the West that the way to win the Cold War was to drop modems throughout the Soviet Union. The idea was that, if the people could communicate, they would

never stand to be ruled over, and if people could communicate freely without fear of being surveilled, they would throw off the yoke of oppression and be free.

Come 2011, and we see revolution in the dictatorships of the Middle East, attributed by some to the Internet. It is to be expected that if people can see how the rest of the world lives and their lives are miserable, they will want things to change. If they see a model of change that works, they will crave that change and strive for it. If they see others who are brave they will become brave. And ultimately, they will put their lives on the line for freedom and liberty. Of course there were revolutions before the Internet. But what comes after the revolution?

At the end of the day, there has to come a stable social contract if people in a society are to thrive and prosper. This is the issue. What social contract will you build for the information age? And make no mistake – you are the people who will build this social contract.

Of course you will build systems and technologies and businesses and all manner of other such things as well. But technology without purpose, without ethical considerations, without humanity, is merely a tool that will be exploited by those who would take advantage of others for their own narrow goals.

There remains the issue of ethics and the question of what the social contract will be in the information age.

Make no mistake about it. As the builders who will create this future for humanity, you are directly responsible for not only the technology, but how it is and can be used.

In my profession, there are various ethical standards that I subscribe to, as do many others who are members of the

same professional societies. I want to mention some of these codes of ethics and the social contracts they ultimately help to form.

I was recently named a fellow of the (ISC)^2, and was required and honored to agree to its code of ethics which has, as its highest priority:

> "Protect society, the commonwealth, and the infrastructure."

After that comes:

> "Act honorably, honestly, justly, responsibly, and legally."

I am also a member of the IEEE, which has a code of ethics that starts with:

> "to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or environment".

So let's talk for just a minute about the social contract that you are engaging in here today as part of the graduating class.

Your professors, your parents, your friends, and the others gathered here today, have invested something in you that is more valuable than diamonds, gold, or silver. They have invested their time and their trust. They have helped to teach you things that can be used for good or ill. You have the capacity to build things that could save millions of lives, or take those same lives away. Together, you and the rest of your generation have the capacity to help enslave the human race or bring about its total freedom.

Your professors, family, friends, society, and the human family as a whole, have placed in your hands the capacity to change the world. It is now your responsibility to take up that

responsibility and to think about what you do as you go through your career, not just in terms of how cool the technology is, but in terms of its impact on the rest of humanity.

Your degree is something that nobody can ever take away from you. As long as you live, you will have earned the degree you receive today. When you think about it, there are very few things in life that can never be taken from you, and this is one of them! From this day forward, and for all of eternity, you will serve as a demonstration of the finest hopes and dreams of humanity for bringing about good in the world. And your decisions will ultimately lead to the future of humanity.

In case it's not obvious by now, I believe in education. And I believe that your education will serve you well for the rest of your life. But I also believe in the social contract. The promise that you bring to the world and the promise that you make by being given the trust of those around you to be the people who lead us into the future of the information age. You have all of our hopes and best wishes, and you hold your future and that of humanity in your hands. I wish you well, and I hope that as you go through life, you think about what you do in the larger view of the world you are creating for us all. Congratulations.