PREFACE

Technology Innovation:
Taking the Long View

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Technology-based innovation since the dawn of the Industrial Age some 200 years ago has gone through numerous changes, on what seems to be a never-ending evolution of both our thinking and our practice of the art of innovation.   Over the past 50 years in particular, we have been introduced to some profound frameworks for understanding the practice of innovation: Joseph Schumpeter's "*Creative Destruction*" of the 1940s and 1950s; Clayton Christensen's "*Disruptive Innovation*" of the 1980s and 1990s; and Henry Chesbrough's "*Open Innovation*" of the early 2000s.   In my classes at Berkeley, we start with these foundations and build modern frameworks based on a very simple definition of innovation: *An innovation is any idea, practice, product or service that is both new and useful.*   The idea of "new" is easy to understand, but what it means for something to be "useful" is much, much harder.   The many dimensions of "usefulness" are the starting point for all of my classes.

Digging deeper into the question of "usefulness", especially for technology-intensive companies, it is essential to clearly grasp the big difference between the two questions "*What is your product?*" and "*What is your business?*"   In the case of Ricoh for example, the product, meaning what customers expect Ricoh to provide for their use, is OA equipment and services.   But the business of Ricoh is not OA systems – it is information.   The following paragraph explains why this is the case.

Business success depends on the decisions we make, and the quality of our decisions ultimately will be evaluated by our customers when they choose to work with us, or choose a competitor, or choose to do something else altogether to solve their business problem.   The decisions we make as a company are not just what product features to offer at what price point – they are ALL of the decisions we make: who we hire, when we hire them, how we motivate employees, how we collect information, how we evaluate information, how we decide what strategies to pursue, which markets we decide to attack and which we decide to abandon, and so on.   There are thousands of decisions that we as management make each day, sometimes without even fully realizing that we are making a decision that will affect the future prosperity of the enterprise.   And the difference between a good decision that creates future value and a poor decision that destroys future value is access to, and management of, information.

The significance of this shift in business – from a focus strictly on products to a focus on information – has not been lost on Silicon Valley.   It is not an accident that the most valuable companies in the world today,

Apple and Google in particular (with a combined market capitalization of nearly USD $1,000,000,000,000), are companies that collect, process, analyze and capitalize on information – information on literally everything that is taking place in the world today. In fact, the core success of Silicon Valley companies today is that they are at the epicenter of the shift from a product-focus to an information-focus, providing services and tools specifically designed for information collection and analysis.

To put a finer point on this idea, success in our business, and the success that we desire for our customers as well as how we will differentiate ourselves from our competitors, is based entirely on how we collect, manage, and interpret information, and how we help our customers do the same. This is especially true regarding analytics applied to big data sets, which these days we refer to as the science of *Big Data*, or *Data Science*.

So, what is the challenge then for all of us tasked with leading our company to new success through innovation? First, it is to fully grasp the realities of today's economy on a global scale, and discern where we are likely headed. Part of this challenge is to accept that many of the big innovations that will shape the world in the next 20 years will come from new companies that can risk everything, and not from the large, incumbent corporations. How we choose to partner, emulate or compete with these new companies will define our future. Second, it is essential to be nimble and willing to challenge the current way of doing business, and be open to ideas that come from outside our company, and even from outside our industry. Finally, it is to be courageous enough to know that many of the experiments we try with new technologies and new business models will not succeed, but that if we don't experiment, we can never uncover new business opportunities.

I refer to this third process as "*the de-personalization of failure*". The only way to never fail is to never take any risk – even though at its essence, business is all about taking calculated, intelligent risks. Companies that succeed again and again are those that encourage calculated, intelligent risks on the part of employees, and that deliberately de-personalize failure, so that projects that do not succeed are genuinely seen as an experiment to be learned from, not as a failure on the part of an individual or group.

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Andrew Isaacs is a successful scientist, business executive, entrepreneur, and educator. He is passionate about mentoring the next generation of technology business leaders and has a strong track record of helping entrepreneurs launch their careers. Isaacs has worked at the crossroads of advanced technology and business innovation in Silicon Valley for 30 years, 15 of those years at UC Berkeley, helping start-ups and established technology companies create and execute successful strategies. He directed UC Berkeley's Management of Technology Program starting in 2000 and since 2006 has served as Faculty Director of UC Berkeley's Center for Executive Education.