

3. INTRODUCTION

Although substantial gains can be obtained by improving institutions, building infrastructure, reducing macroeconomic instability, or improving human capital, all these factors eventually run into diminishing returns. The same is true for the efficiency of the labor, financial, and goods markets. In the long run, standards of living can be largely enhanced by technological innovation.

—Klaus Schwab, World Economic Forum, and Xavier Sala-i-Martin, Columbia University

Advances in hardware and software technologies, ongoing academic research, and dramatic increases in robotics investment have had the collective effect of enabling the development of practical, robust, commercial-class robotics products, technologies, and services in support of applications in a great number of industries. Their consumer equivalents have also come to market and found success. These trends will continue and are accelerating. As such, the robotics sector provides for a vast number of business and investment opportunities for Massachusetts, along with other states, regions, and countries. Massachusetts, however, can boast of a number of distinct and, collectively, unique advantages as a global robotics innovation hub.

Massachusetts is uniquely positioned as a global robotics innovation hub.

3.1. INNOVATION ECONOMY

The Massachusetts robotics sector is supported by a state government that recognizes that the Commonwealth's greatest natural resource can be found “between the ears” of its highly educated workforce. The Massachusetts state government also understands that economic expansion in the long term is dependent on its innovation economy; a complex, dynamic, supportive web of knowledge, technology, entrepreneurship, investment, and smart public-private partnerships.

The state's long-term economic expansion is dependent on its innovation economy.

3.2. STRATEGIC APPROACH

The Massachusetts robotics innovation economy has taken root and is expanding. To nurture and accelerate the growth of this important domain, the Innovation Institute at the MassTech Collaborative selected ABI Research to conduct an analysis of the Massachusetts robotics sector, including describing and quantifying the global robotics marketplace; highlighting dominant research, technical, business, and investment trends; and analyzing public and private robotics business development initiatives. The end result of the analysis is to generate statistically measurable qualities, attributes, and rankings that provide for meaningful interpretation and speak to robotics business development, particularly for new commercial launches—in essence, to produce an actionable roadmap for growing the State's robotics innovation economy.

This document is that analysis. It was developed in consultation with Massachusetts-based business, academic, and investment leaders, as well as with key contributors to the greater Massachusetts robotics ecosystem. This included one-on-one interviews conducted over the course of January and February 2016, as well as consultation with advisory board members at a formal meeting held in Boston on January 28, 2016, and in subsequent discussion held later. Other sources of information and insight included market research studies, along with other publicly available and private sources of information, including state and national governmental publications, financial statements, earnings reports, corporate briefings, government/academic funding announcements, association and industry publications, and more. The expectation is that the results of this study will be used to inform decision making regarding public and private robotics business development initiatives, so that businesses, academia, the investment community, and the Massachusetts state government can work collaboratively to improve the competitive position of the Commonwealth in the economically vital robotics sector.

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Additional Insight: *Due to the requirements for completeness and deep analysis, this report is fairly lengthy. Those policy makers and others who wish to first review the set of recommendations for public sector initiatives designed to drive Massachusetts robotics innovation are directed to the Guidance and Recommendations section. A methodology for assessing and monitoring cluster status, along with implementing the recommendations, is given in the Evaluation and Implementation Methodology section.*
