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## PRIMARY CARE ENTREPRENEURSHIP TO ANTICIPATE DISRUPTIVE ERA OF THE 4TH INDUSTRIAL REVOLUTION

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The Fourth Industrial Revolution (4IR) is the fourth major industrial era since the initial Industrial Revolution of the 18th century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres, collectively referred to as cyber-physical systems<sup>1</sup>. It is marked by emerging technology breakthroughs in a number of fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the Internet of Things, the Industrial Internet of Things (IIoT), fifth-generation wireless technologies (5G), additive manufacturing/3D printing and fully autonomous vehicles.

In the era of 4IR, medical doctors are also facing challenges in how to use IT progress in real clinical setting. Patients and doctors are connected by technologies, including patients and other health workers. More simplified medical services by using minimal invasive technologies have made primary care become interesting and will develop further again in the future, especially in cutting cost of national health insurance program. This disruptive process is running fast and should be anticipated by primary care doctors. One of the best approaches in dealing with this issue is by working on health care technopreneurship. The basic competency is getting started with medical entrepreneurship.

Entrepreneurship is a basic survival skill in modern era. Entrepreneurship is the act of being an entrepreneur, or “the owner or manager of a business enterprise who, by risk and initiative, attempts to make profits”<sup>2</sup>. Early 19<sup>th</sup> century French economist Jean Baptiste Say provided a broad definition of entrepreneurship, saying that it “shifts economic resources out of an area of lower and into an area of higher productivity and greater yield”.

Entrepreneurs create something new, something different as they change or transmute values<sup>3</sup>. To be a good entrepreneur, someone should have the entrepreneurship spirit. Entrepreneurship spirit is not only about owning a business, but also integrating various kinds of innovations to be really implemented. Furthermore, regardless of the firm size, big or small, they can partake in entrepreneurship opportunities. The opportunity to become an entrepreneur requires four criteria. First, there must be opportunities or situations to recombine resources to generate profit. Second, entrepreneurship requires differences between people, such as preferential access to certain individuals or the ability to recognize information about opportunities. Third, taking on risk is a necessary. Fourth, the entrepreneurial process requires the organization of people and resources<sup>4</sup>.

While entrepreneurship is often associated with new, small, for profit startups, entrepreneurial behavior can be seen in small, medium and large sized firms, new and established firms and in for profit and not for profit organizations, including voluntary sector groups, charitable organizations and government<sup>5</sup>. One of the concepts of this idea is social entrepreneurship.

Social entrepreneurship is the use of the start-up companies and other entrepreneurs to develop, fund and implement solutions to social, cultural, or environmental issues<sup>6</sup>. This concept may be applied to a variety of organizations with different sizes, aims, and beliefs<sup>7</sup>. For profit entrepreneurs typically measure performance using business metrics like profit, revenues and increases in stock prices, but social entrepreneurs are either nonprofits or blend for profit goals with generating a positive «return to society» and therefore must use different metrics. Social

entrepreneurship typically attempts to further broaden social, cultural, and environmental goals often associated with the voluntary sector<sup>8</sup> in areas such as poverty alleviation, health care<sup>9</sup> and community development. At times, profit-making social enterprises may be established to support the social or cultural goals of the organization but not as an end in itself.

What about medical doctors, especially primary care doctors as both socioentrepreneurs and technopreneurs? As long as a doctor has innovation in their daily works, they already have the entrepreneurship spirit. In fact, medical doctors are hard workers, fast decision makers, risk takers, leaders, etc. which have equipped them to be good entrepreneurs<sup>10,11</sup>. Unfortunately, medical doctors are lacking the basics of entrepreneurship training. Thus, entrepreneurship trainings which develop many kinds of primary care business models will be needed to fill the gap by stimulating primary care doctors to become entrepreneurs<sup>12</sup>. Those trainings will stimulate primary doctors about their new ideas and how to make basic business plans. They will also get assignments that can be followed after the workshop. By following their assignments, they can be continuously encouraged to implement their business plans<sup>13</sup>.

By doing entrepreneurship projects, primary care doctors can get independent funding support from external sponsors who can be investors of the project. In fact, socioentrepreneurship projects, such as primary care clinic establishment, can be a big project which can facilitate many other primary care doctors' activities e.g. research, pilot projects, teaching their juniors, etc<sup>14</sup>.

If these primary care clinics are supported by advanced technology in the 4th industrial revolution era, then those primary care doctors also become technopreneurs. For example, advancement in biomarker screening that can be connected to electronic devices (e.g. mobile phones), diagnosis by robotic algorithm based on artificial intelligence system, telemedicine, etc. has made extensive progress and opportunities for primary care doctors to develop preventive strategies.

In addition, primary healthcare professionals are the people who most understand about the nature of the primary care itself. Therefore, entrepreneurship is one of the most interesting and challenging programs for young doctors that should be supported by World Health Organization, World Organization of Family Doctors (WONCA), government, and private sectors.

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