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**The Story of Singapore's
Industrialisation:
Integrated
Industrial Structure
with
Modern Industrial Parks**

阮庆文 柏晓洁 袁贺 著

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序言一

JURONG International has played a pivotal role in shaping the regional industrial landscape, having rooted its expertise in the 1990s through its predecessor, JTC International (JTCI). Together with its key partners, it was involved in both master planning and infrastructure development of several industrial parks in Indonesia, Vietnam, Philippines and China.

As a corporatized business unit of JTC since 2001, we have leveraged on our strengths to assist emerging economies in their land use and infrastructure development needs, to as far as India and the Middle East, and most recently, Latin America, Russia and Africa.

On the home front, we have actively participated in the physical planning and infrastructure development of many industrial parks, specialized parks, business parks and R&D centres to meet the varied needs of investors in each phase of Singapore's industrialisation transformation. With these hands-on development experiences, JURONG International has taken a holistic approach in providing consulting services in the master planning and development of industrial townships overseas. This integrated approach of industrialisation strategy and planning with infrastructure development, has helped to differentiate us from other service providers in this field.

This book is the reflection of various authors' experiences in master

planning consultancy as well as the training of Chinese officials and professionals over the years. It examines Singapore's industrialization program, from economic development strategies to their implementation and transformation within a close institutional set-up, providing valuable relevance to the administration of many Chinese cities and economic development zones.

As many Chinese cities are entering a new phase of development and modernization, urbanisation embracing environmental protection blueprints and social reforms, becomes a key priority in the mind of the Chinese local government. Hence, the book will help to bridge the information gap for Chinese readers and provide a comprehensive account of Singapore's industrialisation, as well as the development of modern industrial parks in the last 50 years.

I am honoured to have been a part of this journey and believe that this book will chronicle the eventful industrial development milestones to the best of its ability.

Er Tang Tat Kwong
Group President & CEO
JURONG International Holdings Group, Singapore



集团总裁及总执行长
新加坡裕廊国际

序言二

转型发展、地方治理与空间响应

——简评《新加坡产业发展解读：产业体系构筑与现代
园区建设》

从 20 世纪 60 年代开始,亚洲的香港、新加坡、韩国和台湾通过出口导向型的发展战略快速崛起,形成所谓的“东亚模式”并引起世界关注。这四个经济体成功发展的经验已成为发展经济学研究的典型案例。其中,新加坡的发展模式被称为“国家资本主义”,所体现出的稳定政局、高效地方治理与中国现行地方发展模式相近,其参与建设的中国苏州工业园区的发展成功,更激发起中国地方政府学习新加坡经验的热情。

学术界、政府研究机构都已经对新加坡经济与产业发展进行了深入研究,包括宏观发展战略、政府公共政策、发展演变、招商行动、运作模式等方面。阮庆文先生等著的《新加坡产业发展解读:产业体系构筑与现代园区建设》一书从战略与空间规划角度出发,探讨新加坡从建国工业化初期向现代创新型经济转型发展的不同阶段所面临的机遇和挑战、地方治理措施与空间响应的有机结合。本书提出,新加坡转型发展最大成功之处不在于产业定位、招商引资或建设优质园区,而在于政府把握了一套学习与适应的动态治理系统。这使政府能够在经济发展的不同阶段,审时度势,制定相应的政策,使政府干预与市场调节有机结合,从而推动新加坡经济的转型和升级。这个结论一语中的,总结出新加坡经验的真实内涵。

工业发展积累阶段：稳定社会经济

1965年8月新加坡共和国成立，当时面临巨大的经济和社会建设挑战。新加坡政府借助联合国技术援助事务局工业调查团队的力量，对工业化发展路径进行研究，制订了“新加坡工业化计划草案”，包括成立经济发展局，打造良好基础设施，建设工业区，协商处理劳资关系，提倡技术培训，扩大海外招商引资，就此形成加工出口的工业化策略，破解早期新加坡工业发展的困境和制约条件。

在此阶段，空间响应的发展结果还是工业区的建设，包括了两大策略：第一是工业区和卫星镇的融合，强调工业区与生活区的空间融合，提供充足劳动力和解决就业问题相互适应，同时以邻里中心生活商业服务来为工业区员工提供就近服务；第二是现代工业园区建设，标志性事件是裕廊工业区的建设，规划和发展成为一个依托港口、结合工业区和城市配套的现代化大型工业区，吸引外资企业投资和本地企业搬迁。

传统资本技术密集型产业发展阶段：提升生产力

到1970年代初期，随着国内工业化迅速发展，劳动力资源出现短缺，劳动生产力与生产关系开始出现不匹配。新加坡政府成立“经济委员会”，聘请产业经济专家进行把脉，得到的新结论是新加坡产业经济竞争力正在下降，原因在于劳动生产力提升速度落后于劳动力成本增长速度，必须推进产业转型。至1980年代中期，新加坡制定了经济战略发展规划，确定从跨国公司离岸生产基地逐步发展成为国际商务中心和运营总部基地的目标。在该阶段，M2000和IBH2000（国际商务枢纽2000年）成为标志性的地方治理战略。

M2000参照竞争力优势及产业集群理论，从产业链角度对新加坡主要产业门类提出增链和补链的战略，包括辅助针对性的研发和工业设计活动、设立关键零部件生产设施、鼓励低端资源依赖性制造业向邻近区域转移以及鼓励现代物流设施升级等。IBH2000计划则侧重利用其战略区

位条件、发达的基础设施和人力资源、自由流通的政策,将新加坡建设成为国际商务金融、现代物流、通讯与信息中心。

该阶段,空间响应措施是新型产业园区的建设。首先是在原有产业园区继续发展的基础上,新加坡加大力度发展都市圈外地电子产业地块和扩建裕廊工业区。其次,通过建设物流园区(先是海港物流园区,之后是空港物流园区)来大力发展现代物流产业。再次,建设科学园和国际商务园进行产业升级尝试,主要进驻的是与政府相关的科技机构。

高端制造与服务型经济发展阶段:强化竞争力

在 2000 年左右的时候,东亚经济体对新加坡制造业的挑战日益激烈。基于此,新加坡政府再次组织对产业经济的潜力和竞争力进行深入探讨,认为投资和技术对现有产业的生产力提升将很快面临瓶颈,未来产业发展的主要动力应该是依赖研发和创新创造,通过知识型的产业体系才能实现新加坡经济可持续增长。由此,新加坡政府制定 I21(产业 21 计划)和 T21(21 世纪科技企业家计划)两项计划,以引导制造业向研发、设计、创新创意为主导的知识型经济转型与升级。

在制造业领域,新加坡提出的治理策略包括:推动新加坡向国际市场整合,积极利用国际人才、知识和技术;将新加坡定位为优质区域中心,吸引跨国企业和本土企业将其作为高附加值产品生产基地,并向区域内其他企业提供制造相关服务;提供有利于创业的发展环境,激发自由创意与企业活动;支持创新,开发新商务领域和增长等。在服务业领域,相关治理战略提出扩展现有金融服务、国际贸易、交通运输和物流、会展管理及旅游服务等产业,发展医疗保健、教育、传媒、信息与通信、电子商务等高增长产业,将新加坡打造成为亚洲服务业中心。

在该阶段,空间响应的结果还是特色园区的打造。为了满足石化产业集群的发展需求,新加坡通过填海的方式将七个孤立小岛连接在一起,打造了一个现代化的世界级石化基地——裕廊化工岛。此外,作为对波特产业集群理论的响应,建设多个特色产业园区,包括晶体园、医药制造园、航空物流园、宇航零部件制造及维修产业园区等。同时,响应“第二对

经济翅膀”的政策，开始在海外建设产业园区，包括苏州工业园区、巴淡岛工业区等。

科技创新构建新的发展蓝图：形成综合竞争优势

通过系列产业结构优化调整，新加坡逐渐形成了以电子、石化、医药和海事工程产业为核心的制造业组团以及相应的现代物流、商务服务生产性服务业组团。借助产业集群概念，从产业链优化角度梳理了不同产业的发展策略。但随着全球经济转型发展，新加坡政府未雨绸缪，试图紧跟全球经济新一轮升级发展的步伐，利用科技创新能力打造新加坡在 21 世纪的综合竞争和发展优势。

根据专家建议，新加坡开始大力强化科学技术基础设施建设，要求结合大学与公共研究院作为研发和创新核心驱动力量；另外政府创新国内需求和市场条件，提供更多机会让科技和创新企业借平台拓展区域市场。经济发展局发布了 T21 计划以引导产业迈向研发创新，推进知识型经济的成长。为配合 T21 计划，新加坡国家科学技术局发布“科学与技术发展蓝图”，进一步从科学技术与研发创新的角度向知识与创新驱动的产业转型提出了行动计划。

在该阶段，空间响应的结果是传统园区的升级和新一代园区的建设。其中在传统制造业园区，政府侧重于搭建技术公共平台来帮助中小企业成长和提高他们的生产力；在新一代园区中，重点发展研发、创新和创意为主导的新兴科技产业。新加坡政府园区建设的思路侧重于推进创新型经济的发展，包括研发创新科技企业为主的纬壹科技城，先进精密工程为主的实里达宇航零部件维修中心，绿色环保产业为主的洁净科技园区等。这些新型与特色园区的建设，为研发、创意等产业的发展提供了载体，并大大提高了产业的创新力和劳动生产率。

地方发展的模式一直是学术界和政府机构重点研究的课题，政府主导、市场主导或者第三条道路该如何选择也一直争论不休。新加坡国家资本主义主导的发展模式在过去阶段取得相当成功，根据外部环境和自身基础推出的战略经验更值得我们进一步研究借鉴。但是也应该看到新

加坡政府在地方发展进程中角色的变化:从最初完全主导到现在服务型政府的建设,而市场的力量在逐步强化。这使得我们必须考虑不同阶段、不同发展基础及在不同发展条件下政府治理应该发挥的作用,新加坡的经验是否具有普适性更需要实践的检验,也留待学术界及政府部门从不同案例分析中进一步探讨。

诚如作者所言,本书是他们基于多年规划实践经验及掌握的政府需求方向,对新加坡产业体系演变及工业园区建设经验进行的总结和梳理,而非学术研究,因此在理论分析和研究方法方面都稍显薄弱。此外,本书组织结构相对分散,各章节研究内容明确但在整体上联系不够紧密,也算是本书的白璧微瑕。我相信,本书的出版对中国地方发展能起到积极的借鉴作用。

宁越敏

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English Abstract(英文摘要)

Over the last 50 years, Singapore has achieved a remarkable success in its economic development, industrialisation and urbanisation, which received many international accolades. With such achievements, it has attracted many overseas visitors, government officials, academics and professionals, who come to Singapore to study its development experiences and examine its success factors, with the aims of drawing on some lessons and seeking its relevance to the development and management of their cities and countries.

There is no short of publications written by local researchers and visiting officials and academics on the Singapore's broad economic development strategies, industrialisation programme and general public policies. However, there is a lack of literatures which provides an overall perspective on the Singapore's industrialisation development as well as details how it organises its industrial structure and system and integrated that with the physical planning and development of industrial parks in Singapore.

Having worked for JURONG International in providing master-planning consultancy for some 15 years, the authors have had the opportunity to work and interact extensively with the government officials and professionals in many Chinese cities and economic development zones. In the course of these discussions, many of the Chinese government officials had shown great admiration for Singapore

achievements in its socio-economic development and urbanisation. In particular, they considered that the Singapore's industrialisation and development of modern industrial parks are of relevance to the issues to be dealt with in the development of their cities and management of their economic development zones.

Based on their feedback, it appears that there is an information and knowledge gap in the areas of Singapore's industrialisation and industrial parks development, particularly for the Chinese audience. This book is written to bridge this gap and to provide a more comprehensive account on Singapore's industrialisation and the development of modern industrial parks in the last 50 years.

The intention of this book is not meant to be an academic research work on the Singapore economic development and industrialisation. In the course of our planning consultancy works overseas, the authors realise that the principal actors, the local authorities and the master developers, are mainly keen to get an insight into the solving of practical issues: how did Singapore organise the industrial structure and its contents and integrate it seamlessly with the physical development of industrial parks? Such an understanding would be beneficial to them in the development and management of their cities and economic development zones. With this in mind, the book is intended to focus on three main aspects of Singapore's developmental issues: the industrial development strategies, the organization of industrial structure and the physical development of industrial parks in Singapore.

Basically, the book reviews and analyses four main components of Singapore's industrialisation programme, the broad economic development strategies and policies, the evolution and transformation of industrial structure, the physical planning and development of industrial parks and the government mechanisms in implementing the industrialisation programme and its transformation.

The book begins by tracing the socio-economic development in

the early years of Singapore's independence. This is to demonstrate the tremendous difficulties which Singapore encountered in the early years of its industrialisation.

With this development background, the book then outlines the detailed progress of the Singapore economic development stages and industrialisation programme. This includes the kick-off phase with the export-orientated industrialisation strategy, the 'second industrial revolution' in re-inventing the industrialisation programme, the re-organising and upgrading the industrial structure in pursuit of an innovation and knowledge-based economy and the strategy of building up 'second wing' to expand the Singapore's economic space through regionalisation. A number of key findings and recommendations put forward by the various Economic Review Committees in respect of the economic growth strategies, industrial policies and the development of industrial enterprises are included.

This is followed by looking at the evolution and transformation of the Singapore industrial structure and organisation. From the early stage of industrialisation with labour-intensive industries, moving progressively through the stages of skills-intensive, capital-intensive and technology-intensive industries to the present phase of knowledge-based and innovation-driven industries are covered in detail. Through the application of Professor Michael Porter's industrial clustering and value-chain concepts, Singapore had re-aligned the development focus of industries and rationalised the industrial structure. This had helped to strengthen the Singapore's competitiveness in its key industries, namely Electronics and IT, Precision Engineering, Petro-chemicals, Pharmaceuticals and Bio-technology. In the process of economic development and progress, the industrial market mechanism, the roles of state-owned enterprises, private sector companies and foreign MNCs are discussed. Government efforts and various measures of enhancing the capability of local small and medium enterprises are also

covered.

Good industrial development strategies and sound policies need to be realised on the ground and infrastructure development was the key to accelerating industrialisation. The book next moves on to deliberate on the spatial aspect of the Singapore's industrialisation programme. It begins with the discussion of the Singapore Concept Plan Review carried out in the late 1980s, where a comprehensive assessment and long range forecast of industrial land demand was made. With the industrial land requirements in mind, various methods of land assembly: private land acquisition, reclamation from the sea and the en-bloc re-development of old industrial estates were used to build up a sizeable pool of land resources. This was deemed necessary to maintain Singapore's industrial competitiveness in support of its long term economic growth and development.

Guided by the long range Singapore Concept Plan and the industrialisation programme, adequate land had been carefully set aside and planned for the development of various industrial estates, business parks as well as the advanced science and technology parks. These industrial developments were properly planned in relation to the population and urban centres, environmental considerations, roads and transportation networks and the provisions of major infrastructures. Construction of roads, drains, sewers and public utilities as well as the provision of commerce, social and recreational amenities were built along side with the factories and plants in the industrial parks. In response to the market forces and enterprise needs, different forms of industrial parks, business parks, specialised parks, logistics parks and R&D centres were timely developed and implemented in tandem with the progression of Singapore's industrialisation programme.

In the absence of a strong indigenous industrialists and the lack of necessary industrial skills and expertise in the early years of its in-

dustrialisation, Singapore government played an extensive role and assumed a high-level involvement in the industrialisation programme. The book examines the various state institutions, which were set up to drive the economic growth and spearhead industrial development. The roles and functions of these state institutions, namely EDB, JTC, IES, SPRING and A* STAR are discussed in detail. Over the years, these institutions had collectively transformed Singapore from a colonial trade economy to an integrated and modern industrial economy driven by skills, knowledge, science and technology.

With this transformation, the book attempts to outline and analyse some of the key factors underlying the success story of the Singapore economic growth and industrialisation. As the evolution and transformation process was a complex one, a mere explanation of individual attributes and factors in isolation would not be adequate. Thus, a developmental framework is constructed in the book to illustrate the inter-relationship of the key factors, the institutions set-up and its dynamism beneath the remarkable transformation of Singapore's industrialisation and industrial landscape. Besides the apparent factors, the authors also points out the spirit and cultural traits underlying Singapore's successful economic growth and industrialisation. The pioneer generation of leaders had inculcated a resilient spirit, a sense of vigilance and a pragmatic outlook in the mind of its people and institutions. Furthermore, through a systematic learning and practicing framework, it enabled Singapore to nurture a generation of thinking people and learning institutions, which had strengthened the mindset of continuing improvements, change management and dynamic governance in pursuit of excellence in the economic growth and industrialisation.

The Singapore's industrialisation and economic growth may be seen as somewhat unique due to her geographical and historical circumstances. Nevertheless, Singapore's industrial development

experiences, an integrated approach to economic strategies with industrial infrastructure development and tight institutional partnership, might have some relevance to the administration of many Chinese cities and economic development zones. The book makes some observations on the current state of industrial development and outlines the key issues encountered in the Chinese economic development zones. Drawing on Singapore's development experiences, the book attempts to provide some views in the areas of developing an integrated industrial structure and system as well as building a cluster of modern industrial parks in the Chinese economic development zones. Apart from the technical knowhow and operational framework, the authors are of the opinion that the Chinese local authorities might have benefited more where their decision-makers and officials are ready to understand and appreciate the values derived from the Singapore's experiences: the spirit of resilience, sense of vigilance, pragmatism outlook, systematic learning for continuing improvements, change management and dynamic governance.

As a small city-state with its inherent limitations, Singapore's industrialisation as a means for future economic growth and urbanisation will face great challenges ahead. There was some doubt of the Singapore's industrialisation programme in the long run due to its slow productivity growth and rising competition from the emerging economies. Nevertheless, the book envisages that Singapore can build upon its sound foundations and competitive advantages. It can focus on the development of its niche areas with the following strategies: leveraging on knowledge-based manufacturing and services as the twin engines of growth; striving to be a regional R&D hubs for innovation and commercialisation of new products and processes; taking an integrated approach to funds and wealth management in conjunction with the industrial infrastructure development; creating a liveable place for work, live, learn and play and attracting global

talents, capitals and technologies; and building upon its ‘trust worthy and reliability’ brand name and expand the ‘second wing’ further in providing a wider range of exportable services to the world market.

In striving towards attaining these developmental objectives, Singapore must also continue to embrace the pioneer’s spirit of resilience and pragmatism. By maintaining a sense of vigilance to external changes, continuous learning and upgrading, innovating and adapting the acquired knowledge and technologies wisely to suit our unique situation, Singapore can ensure a bright future for continued economic growth and social progress for the next 50 years.