Military Civil Fusion in China

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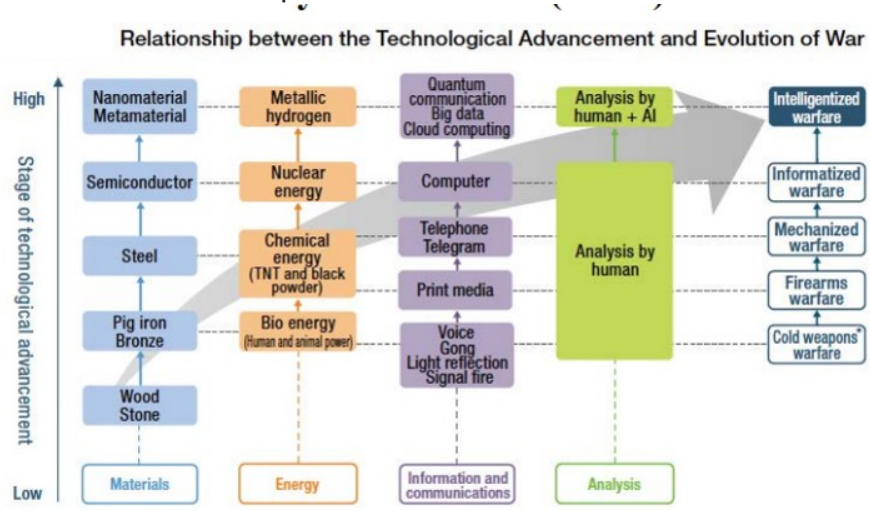
"We must accelerate the formation of a full-element, multi-domain, and high-return military-civ development pattern, and gradually build up China's unified military-civil system of strategies and strateg Xi Jinping, speaking to the Central Commission for Military-Civil Fusion Development, June 20, 2017.

Introduction

Military-Civil Fusion (MCF) is an aggressive national strategy of the Chinese Communist Party (C pursues its MCF Development Strategy to fuse its security, economic and social development strateg integrated national strategic system and capabilities. The Party's leaders see MCF as a vital element of th China to become a "great modern socialist country" which includes developing a "world-class" most advanced military and becoming a world leader in science and technology (S&T). To achieve this, MCI seamless flow of knowledge, technology, resources, materials and talent back and forth between the m industrial sectors and academia. Its objectives are to develop and acquire advanced dual-use technol purposes and deepen reform of the national defense science and technology industries to strengthen a instruments of national power. The CCP is executing this strategy through its own research and developm acquiring the world's cutting-edge technologies, including theft.

strategy's implementation. He chairs the CCP's Central Military Commission (CMC) and the Central C Military-Civil Fusion Development.



Source: Excerpted from *NIDS China Security Report 2021:China's Military Strategy in the New Era,* National Institute for Defense Studies (NIDS), Japan MOD, November 2020, pp. 171, http://www.nids.mod.go.jp.

U.S. Influence

China is a keen observer of western, especially American, theories and practices. It has analysed U Civil-Military Integration (CMI), third offset strategy, Public Private Partnership (PPP) and Defense Adva Projects Agency (DARPA). After careful scrutiny of all these concepts, China arrived at the strategy Fusion. MCF caters to China's specific conditions, requirements and goals.

The term MCF looks like the opposite number to the American term CMI. However, it is far dee complex. As per the U.S. Congressional Office of Technology Assessment, America's CMI is "coope government and commercial facilities in research and development (R&D), manufacturing, and/o operations."[3] But China's MCF strategy is a state-led, state-directed program that leverages the state a power to strengthen and support the People's Liberation Army (PLA), the Communist Party of China's arm American ecosystem, the level of integration has emerged over the decades. In China, MCF is a state-driv rapid implementation. The full scope of MCF is much broader than the public-private partnerships the been promoting.

Chinese scholars feel that MCF is not a new thing. They note that the developed nations promo following ways:-

- They adopt a whole-of-society approach to promote the informatisation of their military forces by usi and technological platforms for their Armed Forces.
- Big defence industrial companies like Lockheed Martin, Boeing, General Dynamics, Northrop Grumr maintain a high proportion of outside contractors, many of which became major enterprises in m fields.
- In recent conflicts, the concept of contractors of the private military companies in the battlefields existence. More than 80 per cent of the U.S. Military's logistical and technical support personnel provided by contractors.
- The national education system normally trains military cadets. In developed countries, about 70- cadets come from universities. Comparatively, the PLA's proportion of cadets trained by its nati system is less than 30 per cent.
- Developed countries successfully use their civilian infrastructure for military use by constructing tunnels and service stations.

There are striking similarities between U.S. and Chinese organisations. The new Chinese CMC Technology Commission resembles the DARPA. 'Rapid response small group', established by the reported in Chinese media as 'China's DIUx' (defence innovation unit) for innovation to improve the PLA

Priority Areas of Science, Technology, and Industry for National Defense Indicated by the State Council

Space	● Major projects including large carrier rockets, nuclear power facilities, deep-space exploration, in-orbit servicing, and maintenance systems ● Yaogan [遥感] data policy; sharing of satellite resources and data between the military and civilian sectors ● Research on construction of launch sites and measuring systems
Cyber	● Building communications satellites and other communications infrastructure ● Improving cybersecurity as well as electromagnetic management technology and equipment ● Promoting the space-terrestrial integration information network project ● Establishing and constructing testing grounds for military electronic intelligence; researching and producing weapons and equipment and contributing them to the civil sector
Maritime	● Coordinating testing needs of military and civilian sectors and testing facilities in the ocean and accelerating construction of deep/far sea testing sites ● Improving technologies for underwater measurements, data transmission, and security; enhancing comprehensive detection capabilities in the ocean ● Promoting construction of deep-sea stations, nuclear power offshore platforms, and deep ocean monitoring and measuring equipment ● Actively developing high-performance icebreakers, polar icebreaking research vessels, polar rescue vessels, polar semi-submersible transport vessels, polar resource exploration vessels, and core parts and materials for use in polar regions; and supporting major projects in the ocean

Source: Excerpted from *NIDS China Security Report 2021: China's Military Strategy in the New Era*, National Institute for Defense Studies (NIDS), Japan MOD, November 2020, p. 68, http://www.nids.mod.go.jp.

MCF development can contribute to the following key positive results:-

- It can support China's transformation into a powerful nation. There is an immediate need improvements in China's national defence capabilities.
- It can help China gain advantages in global technological and military competitions. China needs to c the development of disruptive technologies by advanced countries.
- It provides a tremendous opportunity for the improvement of China's governance system. It will enab of a governing system across sectors, government bodies and domains.
- It supports the creation of a world-class military. The MCF strategy is to work with China's othe strategies in the manufacturing, maritime, space, and cyberspace domains.

The Communist Party in recent years has drastically cut back on its use of the term 'military-civil fus Year Plan Outline of 2021 omits the phrase entirely. In March 2021, 4th Session of the Thirteenth Na Congress passed the most important national strategy for China's military industry, the 'Outline of the Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the People's Rep (The 14th Five-Year Plan).[4] The 14th Five-Year Plan is the most important policy document for Chir economic development over the next five or even 15 years. It is highly relevant to the defense industry prir

Strengthening of the preparation for wars.
Including the augmentation and integration of informatization, mechanisation and smartness.
Emphasis on the strategic capabilities in defence of sovereignty, security and development interests.
Acceleration of weaponry and equipment modernization.

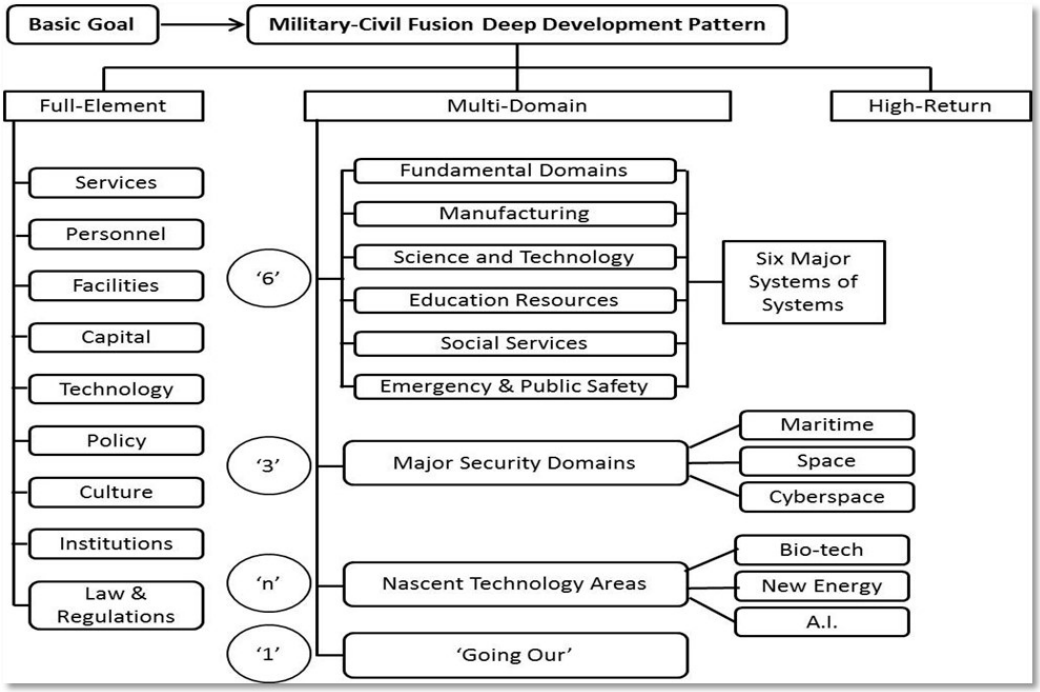
There is a focus on:-

- Self-sufficiency in technology and speedy development as a technical power, encompassing innovations and the original innovation of the national defense technology.
- Speeding up of the development of strategic, cutting-edge and revolutionary technologies.
- A quicker upgrade and renewal of weaponry and equipment and the development of smart equipment.

This document is an upgraded version of China's 13th Five-Year Plan (2016–20) which described th MCF as "form a basic military-civilian science and technology collaborative innovation system, an formation of comprehensive, multi-domain, and high-efficiency military-civilian technology fusion." completion of this objective, the plan charted following seven specific goals to:-[5]

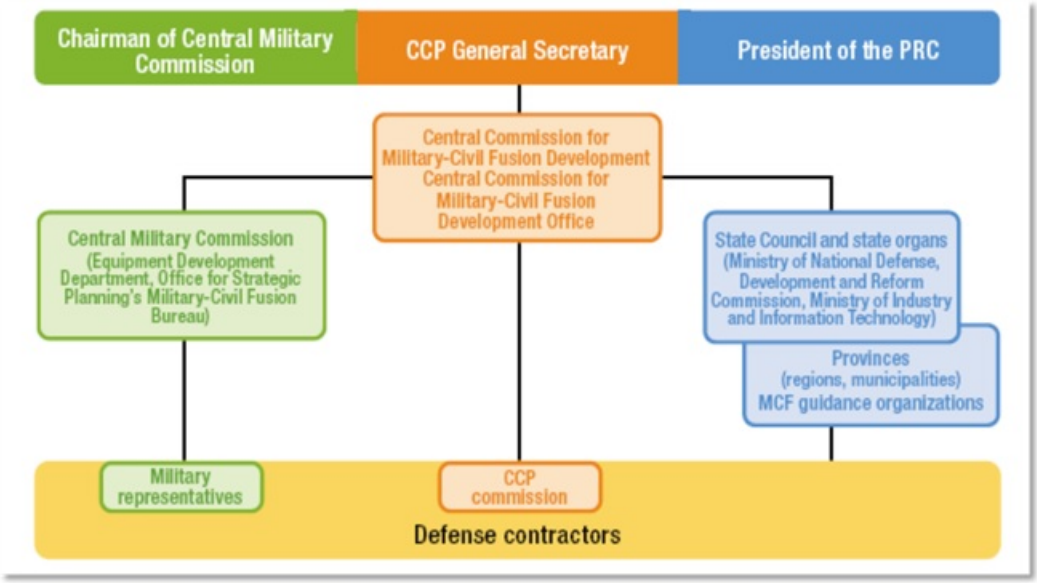
- Strengthen macro-coordination of science, technology, military and civilian integration. Improve the technological MCF system and mechanism. Promote coordination and integration of plans.
- Strengthen the capacity of S&T collaborative innovation between the military and civilian sectors. C

The graphic below illustrates the core components of the military-civil fusion deep development patte



In the military, the Military-Civil Fusion Bureau was established in the Office for Strategic Planning 2016. This bureau is the driving force behind civilian participation in the defence industries. The State Ad Science, Technology and Industry for National Defense (SASTIND), is the force behind "eliminating barr conversion." SASTIND is responsible for the management of national defence company policy. representative offices have been established at each level as representatives of the PLA in defence c other entities and are responsible for implementing contracts, monitoring quality control, receiving produ with the military.

Organisational Relationship Chart of MCF[7]



China pursues MCF through six interrelated efforts. Each effort overlaps with the others and has botl international components. The Party seeks to implement the MCF Development Strategy across every l party-state from the highest national-level organs down to provinces and township. The six system Development Strategy are:-

- **The Advanced Defense Science, Technology and Industrial Systems.** This system focuses on defence industrial base, civil industrial base and technology to transfer mature technologies acro

Each MCF system has linkages between a number of organisations and government entities includin

- Ministry-level organisations from the State Council.
- Lead military organs subordinate to the Central Military Commission.
- State-sponsored educational institutions, research centres, and critical laboratories.
- Defence industry.
- Other SOEs and quasi-private companies.
- Provincial governments.

MCF Funding

The Chinese government is promoting MCF by leveraging guidance funds as an important mech capital and activities. For example, the military-civil fusion industrial development fund launched in Se involved 30.2 billion RMB or $4.4 billion in its initial funding round. According to some estimates, the tota wide variety of guidance funds is in the range of several hundred billion dollars. As of mid-2019, several b funding has been allotted to MCF through funds launched in cities and provinces that include Shan Guizhou, Hebei, Henan, Hunan, Guangdong, Zhejiang, Liaoning, Shaanxi and Heilongjiang.

Quietly, China has invested vast sums of money in Silicon Valley firms with technology relevant to na Crucial defence related targets include sensitive or military-grade equipment such as computer circ hardened programmable semi-conductors, accelerometers and military sensors, high-grade carbon f microwave amplifiers, proprietary and export restricted technical data and thermal imaging systems. Chi are mainly involved in artificial intelligence, robotics, augmented reality/ virtual reality, and financial te estimated that China participated in 10-16 per cent of all venture capital deals, including 271 early-st investment deals worth $11.5 billion in 2015 alone. Examples are:-[8]

- Neurala, an artificial intelligence company, struggled to get funding from the U.S. military. It got Chinese group associated with a state-owned company.[9]
- Quanergy, which develops sensors for military applications, accepted venture funding from the Ch Capital.
- China's State Council financed an initial investment in Canyon Bridge Capital Partners in its attemp takeovers of Lattice Semi-conductor. Later this was blocked by the Trump administration on na grounds.[10]

However, China maintains strict control over inbound investment.[11] Not all China's technology comp to pursue close collaboration with the PLA. Commercial considerations drive them in a fiercely competit Those with international aspirations, like Alibaba, may tend to be less transparent about collaborations w military and defence industry, with some important exceptions. Baidu, a global leader and member of C team in artificial intelligence, and the China Electronics Technology Group Corporation have started a joi apply artificial intelligence, big data and cloud computing to command and control measures.

MCF Espionage

To bring western innovations into its industrial ecosystem, China has increased its cyber and technol activities. Such illegal transfers can occur through exports, foreign direct investment and acquisitions, cy traditional industrial espionage, research collaboration, talent acquisition, and influence operations Christopher Wray stated, "Over the past decade, the FBI has seen economic espionage cases with a increase by approximately 1,300 per cent." There are many examples. PLA Navy submarines and frig German-produced engines exported to China for commercial use.

The Australian Strategic Policy Institute estimates that the PLA has sponsored over 2,500 military engineers to study abroad, especially in 'Five-Eyes' countries (U.S., UK, Canada, Australia and New 2007. China's application of the MCF abroad threatens the democratisation of science and the philosoph openness and collaboration.

China has intensified its regulatory actions deep into private Chinese enterprises to ensure they

Ten Major Outcomes of MCF Identified by the Xinhua News Agency

Item	Description
Tianhe-2	Ranked the world's fastest supercomputer for six consecutive times
Laser gyro	Can be applied to the Long March launch vehicles
BeiDou	Navigation system
Gaofen-2	Earth observation satellite
Hualong-1	Nuclear reactor
Demolition equipment for civilian use and demolition integration platform	Applicable to infrastructure construction and ore mining
Unmanned aerial vehicle	Can be used for distribution in civilian sectors as well as for military purposes
Intelligent robot	Can be applied to lethal autonomous weapons systems (LAWS)
Driverless vehicle	Applicable to military vehicles
Caterpillar-tracked small unmanned platform	Firearm-mounted, night reconnaissance function

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As China moves toward intelligentized warfare, MCF will be a crucial element of the PLA's ove achieve “complete military modernisation" by 2035 and become a "world-class" military by 2049. In July 2 Council issued the AI Development Plan for a New Era, which stated that China will "promote the two-w application of military and civilian scientific and technological achievements, and jointly build and share resources of the military and civilian, to form a full-element, multi-domain, and high return military-civ development pattern." This plan specifically attempts to "direct the results of AI technology toward defen and encourage civilian S&T researchers to participate in major national defense-related AI research."

Role of PLA

The MCF strategy intends to break down the obstacles between the PLA, academia, technolo sectors. This would facilitate the PLA to employ dual-use industries and technologies for military adva capabilities development.

The Central Military–Civil Fusion Development Commission, led by Xi Jinping, has made the Cyber Military–Civil Fusion Innovation Centre, Qihoo-360, a leading Chinese cybersecurity company. He is gui to improve national cyber defences. China wants to leverage 'cyber militias' for its cyber defence. continuously emphasised the dynamism and potential of MCF in cybersecurity and informatization, c 'grasp the historical opportunity of the current information technology transformation and new transforma affairs'. In April 2018, in a speech delivered at the National Cybersecurity and Informatization Work Jinping highlighted the inherent relationships between the market and the battlefield while 'promoting th full-factor, multi-domain and highly efficient development structure for MCF'.[13]

The PLA's Strategic Security Force (PLASSF) will have to keep pace with the rapid, disruptive changes, often driven by research and development in the private sector. These technological chang pursue civil-military integration fusion as an integral aspect of its mission. This involves taking advanta technological advances and leveraging civilian talent. The PLASSF recruits a large number of civilian specialist professionals in cyber defence, aerospace and artificial intelligence. Individual PLASSF units research projects with universities. The quality of education at the SSF's Information Engineering Aerospace Engineering University will be crucial to its cultivation of personnel for command and technical

SSF has been active in pursuing its goals of MCF. Some of the initiatives undertaken are:-

- Partnerships with over nine different universities and companies, such as the University of Science a of China and the China Electronics Technology Group (CETC), to focus on ‘fostering high-end education, training, cooperation, talent selection and exchanges.
- Signed an MCF strategic agreement with China Mobile that enables cooperation in joint constructior infrastructure, information system and resource development and utilisation, emergency communic command and dispatch, ‘smart’ military camps, information security and informatization talent training
- Establishment of the Military-Civil Fusion Intelligent Equipment Research Institute as a collaboratic

There are concerns about the lack of access to large-scale and high-tech facilities and experimental private sector companies. It is also unclear whether the private sector companies will get permission t sensitive projects. On the other hand, some Chinese companies may try to take advantage of the reso rather than provide real contributions to military modernisation. The heavy increase in funding, includin funds dedicated to MCF, can aggravate corruption in the Chinese military and defence industry.

Though there has been noticeable progress in MCF, some experts are worried that, in their cu defence industrial base and the innovation base are not in a position to meet both defence and com Another cause of worry is the defence industrial base's low self-sufficiency on the core, critical techno innovation base's inability to produce original innovations and breakthrough technologies. Bi Ji Commandant of NDU between 2012 and 2017, noted the following problems:-

- "I'm willing to 'fuse' others but not willing to 'be fused' by others."
- "It is okay for others to share resources with me, but I will not share my resources."
- "My game, my turf, my rules."

Conclusion

The National Defense University of PLA observed that progress on the Development of Military- China had been unsatisfactory. The CCP had tried to pursue similar policies earlier without any succes balance between the role of the government and the market is and will be one of the toughest implementing the MCF strategy.

MCF is an aggressive national strategy of CCP. President Xi Jinping, since he took office, has beer on CMF and personally overseeing the strategy's implementation. He argued that there is a pressing ne from 'early-state fusion' to 'deep fusion', a process that had been held up by problematic mindsets, systen vested interests. To effect change and drive results, Xi Jinping, at the first meeting of the Central C Military-Civil Fusion Development on June 20, 2017, highlighted the task's urgency. He urged officials t ramparts, break through solid ice, remove barriers…wade through dangerous shoals, move people's c difficult problems, overcome obstacles, try out new ideas and open new paths."[14]

Endnotes :

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