

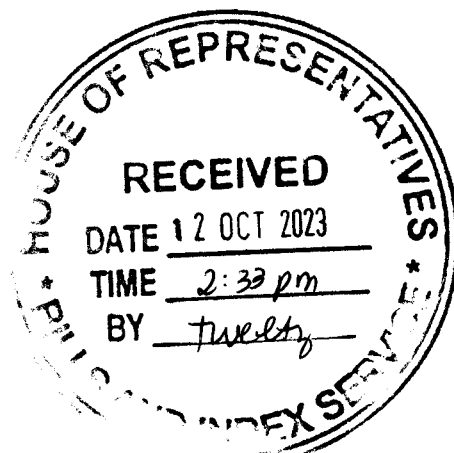


Republic of the Philippines
House of Representatives
Quezon City

NINETEENTH CONGRESS

Second Regular Session

House Bill No. 9404



Introduced by Representative Albert S. Garcia

EXPLANATORY NOTE

This measure seeks to strengthen the advanced manufacturing industry by upgrading and designating the DR3AM Center in the Bataan Peninsula State University (BPSU) as the center for three-dimensional (3D) printing and advanced manufacturing in the country.

Additive manufacturing, also known as 3D printing, a method of creating a three-dimensional object layer-by-layer using a computer created design, continuously gains considerable attention in the academic and research communities as well as in several industries around the world. Its innovative capacity to design, produce and simplify prototypes, and manufacture high quality 3D prints cost cheaper at a shorter period of time. These advancements in 3D printing constantly change how products are designed, manufactured, and used by consumers worldwide.

In 2018, the Department of Science and Technology (DOST) launched two new 3D printing research laboratories: the Additive Manufacturing Research Laboratory (AMREL) and the Additive Manufacturing Center (AMCen). The DOST established these facilities to aid the Philippines in developing its advanced manufacturing industry and be abreast with the continuous world's technological innovation.

AMREL, presently referred to as the DR3AM Center, is the first 3D printing research facility in the Philippines equipped with the latest advanced manufacturing machines. It was inaugurated in 2019 at the Bataan Peninsula State University (BPSU) and has, since then, been used by BPSU students in conducting research for their theses on the applications of 3D printing; development, testing and characterization of new 3D printing materials; sharing of ideas between faculty and students; and rapid prototyping, tooling and manufacturing in the 3D printing industry.

Starting as a research laboratory in 2019, BPSU's DR3AM Center began its operation in 2020. To date, the BPSU has already published over 20 scientific articles related to 3D printing and several utility models and industrial designs have been submitted to the Intellectual Property Office. The DR3AM Center also caters to some spare parts requirements of local businesses and industries in the region. Since 2019, several high school student groups have already utilized the existing facilities of the DR3AM Center for their research projects. The DR3AM Center also trained several faculty members of the BPSU and partner government institutions and private entities on advanced manufacturing. During the height of the COVID-

19 pandemic, the DR3AM Center produced over 3,000 personal protective equipment (PPEs) to help protect our healthcare workers and other frontliners. Through the various projects of DR3AM Center, the BPSU started the incorporation of the additive manufacturing subject in the curriculum of the Bachelor of Science degree in Industrial Engineering, a first in the country. In 2021, the DR3AM Center also hosted the International Forum on Additive Manufacturing and Advanced Materials as well as the National Symposium on Makerspaces and 3D Printing Facilities.

As an important component of higher education, research centers play an indispensable role in facilitating the advancement of technology, promotion of interdisciplinary collaboration, and the development of transdisciplinary research programs. The operation of BPSU's DR3AM Center as the center for additive manufacturing or 3D printing, advanced materials and advanced manufacturing will spur interest in the advanced manufacturing research and development towards the fulfillment of BPSU's ultimate mission of expanding the advanced manufacturing industry for the benefit of the country.

Thus, to catalyze and achieve the full potential of the DR3AM Center as the center for additive manufacturing or 3D printing, advanced materials, and advanced manufacturing, it is crucial that the center be strengthened with the most important elements: structure, facilities, human resources, skills development programs, and financial support.

In view of the foregoing, approval of this bill is earnestly sought.



REP. ALBERT S. GARCIA
Second District, Bataan



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AN ACT

STRENGTHENING THE ADVANCED MANUFACTURING INDUSTRY BY UPGRADING AND DESIGNATING THE DR3AM CENTER OF THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE BATAAN PENINSULA STATE UNIVERSITY AS THE CENTER FOR RESEARCH AND DEVELOPMENT ON ADVANCED MANUFACTURING AND APPROPRIATING FUNDS THEREFOR

Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

SECTION 1. *Short Title.* – This Act shall be known as the “*Advanced Manufacturing Industry Act.*”

SEC. 2. *Declaration of Policy.* – Section 10, Article XIV of the Constitution provides that “*Science and technology are essential for national development and progress. The State shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training, and services. It shall support indigenous, appropriate, and self-reliant scientific and technological capabilities, and their application to the country’s productive systems and national life.*”

Towards this end, the State shall promote and strengthen the development and growth of local innovative ventures, upscale research and development facilities of higher educational institutions, enhance literacy and skills of the academe’s scientific workforce, faculty and students, build up its collaboration with the business sector, and spearhead the development and growth of the advanced manufacturing industry.

1 **SEC. 3. *Definition of Terms.*** – As used in this Act:

2 (a) *Additive manufacturing* refers to the industrial production name for 3D printing,
3 which is the process of transmitting to a three-dimensional printer the digital design that guides
4 the fabrication of a three-dimensional solid product, by depositing materials layer by layer rather
5 than cutting away from a large block of existing material as in most traditional manufacturings,
6 thereby enabling the cost-effective production of complex structures;

7 (b) *Advanced manufacturing* refers to the use of innovative technologies and
8 processes in manufacturing existing products and the production of new products enabled by
9 advanced technologies which includes automation, additive manufacturing, and robotics, to
10 improve the efficiency and productivity of manufacturing advanced materials; and

11 (c) *Advanced materials* refer to a range of advanced polymers, nanoparticles,
12 ceramics, and graphene composites used in 3D printing which enable traditional and advanced
13 electronic applications while taking advantage of the design and fabrication flexibility of additive
14 manufacturing systems.

15 **SEC. 4. *3D Printing Center.*** – The Design, Research and Extension in Additive
16 Manufacturing, Advanced Materials and Advanced Manufacturing (DR3AM) Center of the
17 Department of Science and Technology (DOST) situated in Bataan Peninsula State University
18 (BPSU), hereinafter referred to as the Center, is upgraded and designated as the center for
19 research and development on additive manufacturing, advanced materials, and advanced
20 manufacturing. The Center shall be an independent agency attached to the DOST. The Center
21 shall have its own budget separate from the DOST.

22 **SEC. 5. *Powers and Functions.*** – The Center shall have the following powers and
23 functions:

24 (a) Identify and prioritize research and development projects that maximize and
25 develop the competency in 3D printing and advanced manufacturing of the country;

26 (b) Secure the latest and state-of-the-art facilities for the development, design,
27 analysis, and production of new and innovative advanced materials and technologies for rapid
28 prototyping, and industrial and commercial applications;

1 (c) Conduct appropriate training courses on 3D printing and advanced manufacturing
2 for the faculty, students, and scientific workforce of BPSU and other educational institutions;

3 (d) Spearhead 3D-themed activities, competitions, events, and conventions where
4 international experts are invited to bring in new 3D printing ideas and technologies, broaden the
5 knowledge of the faculty and students of educational institutions and further develop their ideas
6 on advanced manufacturing;

7 (e) Strengthen the academe-industry partnerships in advanced manufacturing
8 research and development by encouraging local and foreign investors to support or jointly
9 venture in potentially viable 3D printing enterprises, start-ups or business ideas;

10 (f) Produce advanced materials products for commercialization using 3D printing and
11 advanced manufacturing technologies towards providing income-generating services to private
12 enterprises;

13 (g) Establish local and foreign linkages in 3D printing research and policy
14 development;

15 (h) Serve as the repository of all 3D printing-related researches, studies, and data
16 generated by the Center and other academic, public, and private groups, organizations, and
17 institutions;

18 (i) Propose and allocate its annual budgetary resources while optimizing resource
19 generation and utilization; and

20 (j) Receive and manage grants, aid, donations, contributions, or any kind of
21 assistance for achieving its objectives, in accordance with the rules and regulations of the
22 DOST. The amounts received and the sources of grants, aid, donations, contribution, or any
23 kind of assistance received shall be published on its website for purposes of transparency.

24 SEC. 6. **Board of Directors.** – The Center shall be administered by the Board of
25 Directors which is composed of a Chairperson, a Vice-Chairperson and nine (9) members. The
26 Secretary of Science and Technology and the Secretary of Trade and Industry shall be the *ex*
27 *officio* Chairperson and Vice-Chairperson of the Board (BPSU), respectively.

1 The Director General of the Technical Education and Skills Development Authority,
2 Chairperson of the Commission on Higher Education, President of Bataan Peninsula State
3 University (BPSU), two (2) representatives from the BPSU faculty and/or staff relevant to the
4 advanced manufacturing industry to be selected by the Chairperson from among the list of
5 nominees submitted by the BPSU shall be *ex officio* members. In addition, two (2)
6 representatives from the faculties of private higher educational institutions relevant to the
7 advanced manufacturing industry, to be appointed by the President of the Philippines and two
8 (2) representatives from non-governmental or advocacy organizations on advanced
9 manufacturing to be selected by the Chairperson from among the list of nominees submitted by
10 the non-governmental or advocacy organizations on advanced manufacturing, likewise to be
11 appointed by the President of the Philippines for a term of four (4) years, as members.

12 The Board shall promulgate its rules relative to meetings, quorum requirements and
13 compensation or allowances of the members of the Board.

14 **SEC. 7. Functions.** – The Board shall perform the following functions:

15 (a) Provide the general direction and priorities of the Center in accordance with this
16 Act;

17 (b) Formulate policies, programs and projects for the development of the advanced
18 manufacturing industry;

19 (c) Evaluate the implementation, efficiency and effectiveness of the programs and
20 projects of the Center;

21 (d) Approve the annual budget of the Center and satellite offices;

22 (e) Establish satellite offices in other parts of the country;

23 (f) Approve the organizational structure of the Center and satellite offices including
24 position classification and compensation of employees in coordination with the Department of
25 Budget and Management;

26 (g) Approve the appointment of consultants, officers, and employees of the Center
27 and satellite offices;

28 (h) Monitor and review the programs and projects undertaken by the executive

1 director to implement and enforce research and policy direction and priorities;

2 (i) Assist the Executive Director in generating resources and obtaining logistical and
3 financial support for the programs and projects of the Center and its satellite offices; and

4 (j) Assign additional powers, functions, and duties of the Executive Director in
5 accordance with the objectives of this Act.

6 **SEC. 8. *Organizational Structure.*** – The Center's research and policy direction and
7 priorities shall be determined by the Board and implemented by an Executive Director appointed
8 in accordance with Section 9 of this Act. Within thirty (30) days after the effectivity of this Act,
9 the Executive Director shall draw the organizational structure and staffing pattern of the Center
10 to be approved by the Board. In carrying out its functions, the Center shall be supported by a
11 pool of experts and researchers on advanced manufacturing and related sectors from various
12 public and private universities across the country, and other technical staff.

13 **SEC. 9. *Executive Director.*** – The Center is headed by an Executive Director who
14 shall be appointed by the President of the Philippines for a term of four (4) years subject to
15 reappointment, a Filipino citizen, at least thirty-five (35) years of age, a degree holder in
16 computer engineering, mechanical engineering, applied mathematics, computer science or
17 related field of studies, possess executive and management experience of at least ten (10)
18 years, and considerable knowledge on the advanced manufacturing industry.

19 **SEC. 10. *Functions of the Executive Director.*** – The Executive Director shall:

20 (a) Implement and enforce research and policy direction and priorities, policies,
21 decisions, orders, rules, and regulations determined by the Board;

22 (b) Oversee the day-to-day operations of the Center, provide technical and
23 administrative support to the Board, and assist the Board in the performance of its tasks;

24 (c) Exercise administrative and supervisory functions over the planning,
25 implementation, and evaluation of the policies, programs, and projects of the Center including
26 satellite offices as may be established pursuant to this Act;

27 (d) Recommend to the Board the organizational structure of the Center including the
28 position classification and compensation of employees; qualification and appointment of

consultants, officers, and employees of the Center and satellite offices; and overall budget of the Center;

(e) Submit to the Board regular reports on the Center, to include annual reports on operations, status of programs and projects, and the financial condition of the Center;

(f) Apprise regularly the Board on the programs and projects of the Center;

(g) Execute contracts, incur obligations, acquire and dispose of assets, and deliver documents on behalf of the Center, including negotiated or consultancy contracts for personnel and for the Center's pool of researchers within the limits of the authority determined by the Board;

(h) Generate and obtain logistical and financial support for the programs and projects of satellite offices with the assistance of the Board; and

(i) Exercise and perform such other powers, functions, and duties as may be authorized or assigned by the Board in accordance with this Act.

SEC. 11. *Satellite 3D Printing Centers.* – Satellite 3D printing centers may be established by the Board. The satellite 3D printing center shall be headed by a Director to be appointed by the Board from a list of pre-screened and qualified applicants submitted by the Executive Director based on criteria approved by the Board.

SEC. 12. *Functions of the Directors of Satellite Centers.* – Subject to the policies of the 3D Center, the directors or project leaders of subsequent satellite 3D centers shall perform the following functions:

(a) Administer the policies, programs and projects of the 3D Center in the satellite center;

(b) Recommend the creation of divisions and sections including the staffing pattern in the satellite center;

(c) Prepare the budget of the satellite center;

(d) Approve the expenditures of the satellite center;

(e) Recommend to the Executive Director the appointment of personnel or consultants;

(f) Recommend policies, programs and projects to the Executive Director of the 3D Center; and

(g) Perform such other functions as may be assigned by the Executive Director of the 3D Center.

SEC. 13. *Coordination of the 3D Center with Satellite Centers.* – The Board shall, through the Executive Director, coordinate, monitor and evaluate the implementation of the 3D programs in the satellite centers.

SEC. 14. *Donations and Grants.* – All donations, contributions, grants, bequests, or gifts, in cash or in kind, shall be received and used directly and exclusively for the benefit of the advanced manufacturing industry: *Provided*, That acceptance of grants, bequests, contributions, and donations from foreign governments shall be subject to the approval of the President of the Philippines, upon recommendation of the Secretary of Science and Technology and the Secretary of Foreign Affairs.

SEC. 15. *Appropriations.* – The amount necessary for the initial implementation of this Act shall be charged against the current budget of the Department of Science and Technology. Thereafter, the funds necessary for the continuous implementation of this Act shall be included in the annual General Appropriations Act.

SEC. 16. *Implementing Rules and Regulations.* – Within sixty (60) days from the effectivity of this Act, the Secretary of Science and Technology shall, in coordination with the designated members of the Board, promulgate the necessary rules and regulations for the effective implementation of this Act.

SEC. 17. *Separability Clause.* – If any section or provision of this Act is declared unconstitutional or invalid, the other sections or provisions which are not affected shall remain in full force and effect.

SEC. 18. *Repealing Clause.* – All laws, presidential decrees, executive orders, rules, and regulations or parts thereof inconsistent with or contrary to the provisions of this Act are hereby repealed, amended, or modified accordingly.

SEC. 19. **Effectivity.** – This Act shall take effect fifteen (15) days after its publication in the *Official Gazette* or in a newspaper of general circulation.

Approved,