Al as a Nation-Defining Capability The National Center for Al Research

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AI: Opportunities and Challenges for Philippines Industries

26 October 2021





ABOITIZ SCHOOL OF INNOVATION, TECHNOLOGY, & ENTREPRENEURSHIP PART 1

PART 2

Industry-Academedriven DS and Al Projects

National Center for Al Research





ABOITIZ SCHOOL OF INNOVATION, TECHNOLOGY, & ENTREPRENEURSHIP

Investments in AI, 2021



Global enterprises say they're investing in Al





Artificial Intelligence Applications



Governments around the world see AI as a nation-defining capability.



A 92 billion USD uplift to the Philippine GDP

...while AI adoption is still in nascent stages across Southeast Asia, **more than 70 percent of AI users, providers, and investors see AI as crucial to the region's future** and say AI adoption must accelerate.

> KEARNEY edbi

Challenges



2 Internal Support



Resources





Data Science Talent

Maximizing ROI with AI

24.5



ABOITIZ SCHOOL OF INNOVATION, TECHNOLOGY, & ENTREPRENEURSHIP



Analytics, Computing, and Complex Systems laboratory



Houses full-time research scientists and research engineers.

- Industry Development Manager
- Program Manager
- 2. Houses fastest Al supercomputer in the Philippines.

Roles:

 → engage private and public organizations in R&D; part of AIM's consulting arm
 → publish academic papers
 → engage MSDS program





ABOITIZ SCHOOL OF INNOVATION, TECHNOLOGY, & ENTREPRENEURSHIP

Government, Industry, International Organizations, and Non-profit Organizations



Analytics, Computing, and Complex Systems laboratory

10-15 members



Master of Science in Data Science

> 60 students





ABOITIZ SCHOOL OF INNOVATION, TECHNOLOGY, & ENTREPRENEURSHIP



Three Cycles: 39 DS/AI R&D Projects, over 50 scoping activities



Engagement 2

Three Cycles: 39 DS/AI R&D Projects, over 50 scoping activities

Engagement 2



MSc in Data Science 2020 Capstone Projects

15/28 USE CASES



WHAT'S IN THE NEWS?

Producing accurate and explainable GDP nowcasts in the Philippines using network science and machine learning



Predicting Length of Stay and Bed Utilization

J. Gacera, E.J. Medina, J. Rebanal, R.J. Roberto

Mentors Erika Fille T. Legara, PhD Christopher P. Monterola, PhD A capstone project by Chua, David, Rivero, Sy

Mentored by Prof. Christopher Monterola, PhD Prof. Jesus Felix Valenzuela, PhD Prof. Christian Alis, PhD In collaboration with ASIAN DEVELOPMENT BANK



AVOID SPOILAGE of feeds 100 Million cost reduction



AI in Manufacturing

PREDICTIVE MAINTENANCE

MACHINE-HUMAN INTERFACE optimization

₱75 Million savings, 10 products/annum



AI in Smart Governance



PATTERN RECOGNITION

Amodia, Domingo, Soriano, Orencia, Monterola

PATTERN-BREAKING detection

99% reduction of processing time

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V201041	2,500	2,500	1900	1,530	1,900	1930	
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Earnings Before Tax	3,594	16,645	23,558	37,622	39,825	46,314	
Tarine Carlos	1120	4,050	0.403	10.933	11.538	12,355	1111 A.
Net Earnings	2.474	11.791	21.075	26.713	28,227	33.345	
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Cash	161371	1210	183,715	271069	238,990	212,530	
Accounts Necelyable	5,100	6,904	6.997	7.117	1.639	0.807	
Inventors	7,805	8,601	9,825	10.531	11.342	11,715	
Propriet/&Equipment	45.900	42,390	40,145	38,602	37,521	37.513	
Total Assets	228,376	239,865	240,252	267,319	295,951	329,504	
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Liabilities	100000	11.325222	19225	0236237	100000	0010000	
Accounts Payable	3.902	4,900	4.912	5.295	5,671	5.939	
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Total Liabilities	\$3,302	54,800	34,512	35,285	35,671	35,998	
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PetervedEarnings	2,474	14,265	35,340	62,053	90.290	\$23,627	
Shareholder's Equity	172,474	184,265	205,340	232,053	260,280	293,627	
Total Liabilities & Shareholder	228,376	239,065	240,252	267,319	295,951	329,584	
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Clocing Cadh Balance	167,571	101,210	103,715	211,065	233,550	272,530	

500 ACCOUNTS										
20,000 man-hours / month										



11 minutes for the same task

AI in Healthcare

RESOURCE OPTIMIZATION

HOSPITAL CAPACITY prediction **P15.3 Million** saved per annum/10 diseases



Return of Investment

- 1. \$10M (MSDS 2019), \$40M (2020), \$28M (2021)
- 2. Social and developmental impact
- 3. Real-world sandboxing for data science students



Challenges

- Lack of an R&D culture 1.
- 2. Data gaps
- Project risks (\$\$\$, 🔯, 😕) 3.



- Scoping activities 4.
- Lack of mentors who are 5. practitioners
- Scaling up 6.



NATIONAL CENTER FOR ARTIFICIAL INTELLIGECEN RESEARCH



National Al Roadmap FOR THE PHILIPPINES

2 PILLARS

4 STRATEGIC DIMENSIONS

7 STRATEGIC IMPERATIVES

42 STRATEGIC TASKS



Objectives

- 1. To maintain the regional and global competitiveness of local industries noting that AI is one of the biggest drivers of innovation for enterprises.
- 2. To identify **key areas (in both R&D and technology application) for investing** both time and resources of government, industry, and society.
- 3. To recommend ways for effectively **fostering a triple-helix (R&D) collaboration**, essential to national development.
- 4. To suggest approaches for **preparing the future workforce** for the jobs of the future.
- 5. To attract the biggest industries to set shop in the country, and thus generating more jobs for the Filipino people.



Make internet accessible and affordable 13. Develop competency in AI research as measured by publications, patents, and technology disclosures Improve internet quality. Ensure internet access of enterprises is reliable, secure 3. Invite and recruit international experts that can bring in new AI capabilities. and are at least within global averages. 15. Provide funding for AI algorithmic innovations. 4. Ensure government agencies and other public institutions serve as Transform institutio reliable areas for information access and transfer. Help industries innovate through an Rep Solo and a value extraction Strengthen academe-industry partnerships in AI R&D. 5. Ensure that HEIs and RDIs have access to reliable and secure networks. Incentivize HEIs to promote R&D internships with local private institutions. 6. Make public data open, freely available, and downloadable in digestible format and ready for analysis. 18. Create guantifiable measures to track, coordinate, and improve government services and policies for industries. Build a national data center (NDC) with a reliable and robust aximize the data infrastructure and data management system. Strengthen technology transfer framework between HEIs/RDIs and industry. 8. Encourage government agencies, research institutions, RESEARCHAN top universities, and big state universities to 20. Identify and prioritize sector-specific R&D projects that can maintain their own data centers linked to the NDC. maximize impact of AI research. Support and Nurture AI startup 9. Work with private institutions to link public and private datasets that will allow for integrated data search. t of AI R&D Track and analyze the quality and quantity of jobs displaced, created, lerate innovation with A 10. Encourage and promote data analysis across all functions and/or transformed as a result of AI academe-industry partnerships. of businesses, industries, and government agencies. Identify and support local AI startups. 11. Promote projects that would enable access to more sensitive NATIONAL datasets given clear business/social value. IMPLEMENTATION AI 23. Develop state-owned venture funds and invest in AI startups 12. Extensive and up-to-date training of analysts and data WORKFORCE DELETE OPMENT scientists to extract actionable insights from publicly available data. **STRATEGY** 24. Encourage and incentivize investors and venture capitalists 28. Promote data literacy for all. to support promising AI startups. 29. Ensure proper training of teachers in Data Science and Analytics (DSA) Government to co-host AI-themed hackathons and other competitions 30. Develop graduate programs centered on data science and Al. REGULA between enterprises that use AI technologies. Increase number of graduate students in business analytics, data science, and AL Government to co-host events inviting global/regional experts in Al Furture future Al talents 32. Promote lifelong learning and design learning pathways for and successful AI and/or data-driven startups. out-of-school individuals. Build an Al ecosy 27. Build a National Center for AI Research (N-CAIR). 33. Include data science and analytics, including data visualization and storytelling, as general education courses in universities and colleges. 40. Ensure industries and businesses, especially micro and SMEs, can freely 34. Work with technology companies to provide sufficient computing resource compete in an AI-driven and data-driven environment. and equipment to students and teachers. 35. Incentivize industries to offer Learning and Development (L&D) programs Review and transform business regulations for ease of business, that improve digital/data literacy. especially in launching new platforms, products, and services. 36. Develop sector-specific curricula and/or stackable programs with varying degrees of specialization (low, medium, high). Establish a committee of experts in data and AI ethics who will guard against Identify industry-specific tools needed to help upskill the country's workforce. abuse/misuse of data and AI algorithms. 38 Incentivize industries to send employees for graduate studies that focus on R&D towards developing a scientific culture within organizations. Identify jobs that are vulnerable to automation and other Industry 4.0 technologies and map the skills that need upgrading or retooling.



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STATION AND STATION AND CONSTRUCTURE

AI

IMPLEMENTATION

WORKFORCE DEVELOPMENT

ADIRGING FIRTURE AI talents

Co

Review and transform business regulations for ease of business, especially in launching new platforms, products, and services.

Establish a committee of experts in data and AI ethics who will guard against abuse/misuse of data and AI algorithms.

STRATEGIC TASK #27 of 42 Build a National Center for Al Research (NCAIR) DTI, DOST, NEDA

To further establish the country's role in AI R&D and applications in the region, we need to build a **National Center for AI Research** (N-CAIR) that employs full-time scientists and research engineers. N-CAIR will also house the **National Data Center** and **National Research Cloud**, having the necessary computing facilities to collect and manage data and drive research, including the advancement of algorithmic innovations.

The creation of this is central to the implementation of the AI roadmap as it will serve as the **Nexus to AI competitiveness of the country**. It is expected to be central to world-class R&D activities and coordinators and drivers of AI integrators to be deployed in regional hubs identified by the DOST.



Master and push the boundaries of Al Accelerate Innovation with Al



Master and push the boundaries of Al Accelerate Innovation with Al

MODELS



- 1. R&D for socio-economic needs; R&D for the immediate benefit of industry and greater good of society
- 2. At the forefront of technological innovation
- 3. Interdisciplinary and cross-disciplinary research; houses full-time research scientists and engineers
- 4. Advance scientific discovery to strengthen competitiveness of national Science and Technology
- 5. Nurture and develop R&D talents and leaders.



Master and push the boundaries of Al Accelerate Innovation with Al

NCAIR – Al Research Council

Priority Research Programs



AgriTech and AquaCulture





Transportation and Urban Science







Smart Manufacturing





Healthcare





Resilience Technology











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FORMER DTI SEC

INTER-AGENCY DISCUSSANTS























THANK YOU

SALAMAT

Tagalog / Filipino





Arabic

ของอกปละ

Thai

TERIMA KASIH

Malay / Indonesian



Lao



Korean

ありがとう

Japanese



Chinese