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The voice of engineers

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Inquiry Panel Confirms Violations in PEC Meeting Proceedings and Decisions

Registrar's elevation, ADR payments, GB Elections breach original decisions of 49th Governing Body meeting

By **Manzoor Shaikh**

No one knows how long the minutes of the meetings of the Pakistan Engineering Council (PEC) have continued to be tampered with, and thus decisions made in deviation from the outcomes of the original meetings' proceedings.

At least the minutes of the 49th meeting of the Governing Body have been established to be tampered with. A panel comprising GB members, constituted by the GB itself, has discovered that the elevation of the Registrar to Grade

22, payments made to ADR experts, and the conduct of the 2024-27 GB elections were in violation of the original decisions of the 49th Governing Body meet-



ing.

The panel, which met on April 30 at PEC Headquarters, Islamabad, writes regarding the empanelment of ADR experts that "the

minutes were recorded correctly; however, the implementation deviated from the decision of the 49th GB. It was resolved in the 49th GB that the empanelment of

ADR experts would not be limited to CIARB members, and the advertisement should be revised accordingly. This was done. However, partial payments were

made prior to GB approval and not reported subsequently. Moreover, further payments were made against the 49th GB decision."

Not only that, but the issue of the elevation of the Registrar of the PEC—which engulfed the proceedings of the last meeting of the Governing Body, dur-

ing which members besieged the seat of the chairman (a rare event in the history of the Council)—has also been established to be the result of

tampering with the minutes of the meeting. The panel says in its report that "the minutes of the 49th GB were incorrectly recorded. The GB had only approved

the eligibility criteria for the upgradation of the Registrar's position to PEC Scale-22, not any individual promotion. A corrigendum removing the word 'incumbent' was approved based on members' observations, but it was never circulated. The promotion of the incumbent Registrar was never approved in the 49th GB. Speaking orders from the Secretary MOST, issued under directions of the Honorable Lahore High Court, were not presented to the 50th or 51st GB meetings. The withdrawal of a writ petition by three Vice Chairmen (KP, Sindh, Balochistan) was conditional upon:

A fair opportunity for all eligible PEC Scale-21

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Pakistan Launches Drive to Boost Export-Quality Medical Devices

In a groundbreaking effort to transform Pakistan into a global hub for high-quality medical equipment, a national initiative titled “Breaking the Barriers” has been launched under the broader Pakistan Made Move programme.

This initiative seeks to identify and eliminate obstacles hindering the export of locally manufactured, export-standard medical devices and equipment.

The campaign is being spearheaded with full support and sponsorship from key organizations, including the Drug Regulatory Authority of Pakistan (DRAP), Saman e Shifa Foundation, Aika Technology (in collaboration with SoluNox and Kolojic UK), and Saleem Habib University.

Key Focus Areas:
The programme is designed to foster innovation and self-reliance in:
• Reverse Engineering
• Research & Development

- (R&D)
• Transfer of Technology (ToT)
• Real-time Indigenization of medical equipment
By creating an ecosystem that links startups, manufacturers, technology developers, academic institutions, and regulators, the initiative aims to bridge the gap between innovation and implementation.
Capacity Building and

“Breaking the Barriers” series will be held on June 14, 2025, at Fatima Business School, Saleem Habib University. The event will gather:
• Investors
• Industry leaders
• Experts and professionals
• Academia
• Government officials
This forum will facilitate a collective dialogue to identify and remove export bottlenecks and accelerate

import substitution, aligning with Pakistan’s national economic priorities.

Strategic Vision
The Pakistan Made Move aims to make “Made in Pakistan” synonymous with

quality and reliability in global medical markets. By promoting third-party certification, fostering innovation, and strengthening public-private partnerships, the initiative aspires to elevate Pakistan’s medical device manufacturing to internationally competitive levels.

This marks the first step in a series of ongoing programmes focused on positioning Pakistan as a serious global contender in the medical technology sector. – ER Report



Training
A major highlight of the initiative includes around 40 training courses organized by Aika Technology and Saleem Habib University. These will cater to DRAP officials, government decision-makers, industry stakeholders, and academic partners—focusing on international certification standards and capacity building within DRAP to meet global regulatory benchmarks.

First Seminar Scheduled
The first seminar under the

Inquiry Panel Confirms Violations in PEC Meeting Proceedings and Decisions

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officers.

A three-month extension of the incumbent Registrar from July 28, 2024.”

The findings of the panel further state: “The incorrect recording has led to serious implications requiring further inquiry at a relevant forum. All the members present unanimously agreed to the above decision.”

Moreover, the panel—which had unanimously decided that the decisions of the Committee would be drafted during the meeting after hearing the views of all the learned members and reviewing the audio recording of the proceedings of the 49th Governing Body meeting—concluded with consensus on PEC Elections 2024 that “the minutes were inaccurately recorded. The 49th GB had resolved to conduct the 2024-27 GB elections using the same nomenclature and seat allocation as for 2021-24, including both province-wise and discipline-wise groupings. While province-wise allocations were retained, discipline-wise groupings were altered during implementation.

Despite being informed of the original GB decision, the Election Committee proceeded based on the recorded minutes provided by the Registrar’s Office. The 2024-27 election advertisement was issued in line with the erroneous minutes. It is recommended that responsibility be fixed.”

The panel had unanimously decided that the Committee’s decisions would be drafted during the meeting after hearing all members and reviewing the audio recordings of the proceedings of the 49th Governing Body meeting. In pursuance of the Committee’s ToR, the minutes relating to three issues were selected for review and listening.

Now that tampering with the decisions of the Governing Body—which runs the Council in actual terms as per the Act and Bylaws—has been unearthed by the panel, the basic question arises: will the Chairman of the Council convene the meeting of the Governing Body and initiate proceedings to act against the alleged manipulators? A significant number of GB members and engineers across Pakistan doubt it. “This practice is not a new one and there are many transparency issues in the functioning of

the Council,” says a senior engineer. A certain system is deeply entrenched, and rather than breaking it, most engineers who succeed in making their way into the Council prefer to reconcile with it.

Engineers who want action say the Chairman seems to have started evading addressing what they dub the most serious manipulation and alteration of Council decisions. “He should have called the meeting by now, but he did not—and maybe Pak-India tensions might have given him an excuse,” says an opposition GB member.

Given the suspicions following the tampering with the Council’s decisions, 21 GB members hailing from TEP have given notice to the Chairman for convening the meeting. The notice, a copy of which is with the ER, calls on the Chairman to convene an extraordinary GB meeting to discuss an issue regarding the “Correctness of Recording of Minutes of the 49th GB Meeting.”

Under Clause 34(5) of the PEC Bylaws 1976, the Chairman is under an obligation to call the meeting within 14 days after the notice.■

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Pakistan Allocates 2,000 MW for Bitcoin and AI Centers

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in a statement issued Sunday. "Following this landmark announcement, more global players are expected to engage in investment talks in the coming weeks."

From Idle Capacity to Digital Assets

Pakistan has long struggled with underutilized power generation capacity. With this new policy direction, that capacity is being repurposed for high-value digital uses. Bitcoin mining and AI data centers, both known for requiring consistent, high-volume electricity, provide an ideal outlet for surplus energy.

"This is a paradigm shift," said Bilal Bin Saqib, CEO of the Pakistan Crypto Council. "With proper regulation, transparency, and international cooperation, Pakistan can emerge as a global leader in both AI and crypto infrastructure."

He added that energy-backed digital initiatives not only attract investment but also enable the government to earn foreign exchange in USD via Bitcoin mining. Furthermore, with regulatory evolution, Pakistan could begin to accumulate Bitcoin in a national crypto wallet—a significant departure from traditional PKR-based energy exports.

Competitive Edge Amid Regional and Global Trends

Pakistan's relatively low energy costs and land availability offer a strong competitive edge over regional peers like India and Singapore, where rising utility prices and land con-

straints are bottlenecks to scale. On a global level, demand for AI data centers has surged past 100 GW, while supply lags behind at just 15 GW—creating a window of opportunity for countries like Pakistan with surplus capacity and emerging policy frameworks.

Boost from Submarine Internet Cable Connectivity

Strengthening this push is Pakistan's improved digital connectivity, with the recent landing of the Africa-2 Cable Project, the world's largest submarine internet cable. Spanning 45,000 kilometers and linking 33 countries through 46 landing points, the cable enhances Pakistan's bandwidth, latency, and internet resilience—vital features for hosting world-class AI and blockchain infrastructure.

Empowering a Digital Economy of 250 Million

With a population exceeding 250 million and an estimated 40 million crypto users, Pakistan is uniquely positioned to become a regional leader in digital services. Local AI data centers will support national sovereignty in data handling, strengthen cybersecurity, improve digital service delivery, and drive capacity-building in key areas such as cloud computing, engineering, and data science.

These centers are expected to create thousands of direct and indirect jobs, contributing to a highly skilled, future-ready workforce.

Future Phases:

Renewables, Partnerships, and Incentives

This allocation represents only the first phase of a broader, multi-stage digital infrastructure development roadmap. Future plans include:

- Expansion of facilities powered by renewable energy, utilizing Pakistan's vast wind (50,000 MW potential in the Gharo-Keti Bandar corridor), solar, and hydropower resources.

- Formation of strategic international partnerships with leading blockchain, AI, and data infrastructure firms.

- Creation of fintech and innovation hubs to foster homegrown digital entrepreneurship.

To encourage private investment, the government is also preparing policy incentives, including tax holidays, duty exemptions on imported equipment, and reduced taxes for AI infrastructure developers.

Vision for a Sovereign Digital Economy
Pakistan's combination of surplus power, geographic location, advanced digital connectivity, renewable potential, and a digitally active population forms a powerful value proposition. With coordinated investment, regulation, and global collaboration, Pakistan is poised to emerge not only as a key destination for digital infrastructure but also as a sovereign digital economy—accumulating assets like Bitcoin, exporting digital services, and shaping the next era of technological leadership. - ERMD

Pakistan Hosts International Conference to Tackle Geological Hazards

The conference was inaugurated by Director General Dr. Sajjad Ahmad, while Deputy Director General and Project Director Mr. Adnan Alam Awan provided an overview of Pakistan's geohazard landscape and the urgent challenges

ahead.

Renowned international experts, including Dr. Roger Bilham (USA) and Dr. François Jouanne



(France), delivered keynote addresses focused on seismic gaps and tectonic monitoring using

GNSS. Dr. Bilham urged focused intervention in critical seismic risk zones across Pakistan.

The event featured nine technical sessions, hosting over 50 national and international research presentations on seismic mapping, GNSS and InSAR monitoring, landslide risks, and disaster mitigation strategies. Participants included

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Engro Completes Telecom Infrastructure Deal with PMCL

Engro Corporation Limited (ECORP), through its wholly owned subsidiary EConnect (Private) Limited, has completed a major telecom infrastructure deal with Pakistan Mobile Communications Limited (PMCL), a key development in the country's digital connectivity drive.

The arrangement, initiated under an Amalgamation Agreement dated December 6, 2024, involved the merger of

PMCL's wholly owned subsidiary, Deodar (Private) Limited, into EConnect. The Scheme of Arrangement, filed before the Islamabad High Court under Sections 279 to 283 and 285 of the Companies Act, 2017, has now been

sanctioned and will become effective from June 3, 2025.

According to Engro, this amalgamation represents a strategic milestone for Pakistan's telecom infrastructure development. "Engro will now play a significant role in expanding affordable and reliable telecom services across the country," the company stated.

The enhanced tower-sharing portfolio will allow mobile network operators to improve coverage, lower costs, and bridge the digital divide more effectively.

This investment reaffirms Engro's growing focus on telecommunications as a core business vertical. The company expects it to generate stable cash flows and fuel future investments within the sector and beyond. - ER



sanctioned and will become effective from June 3, 2025.

The transaction has received all required corporate and regulatory approvals, including clearances from the Competition Commission of Pakistan and the Pakistan Telecommunica-

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Korangi Fish Harbour Modernization Set to Unlock Over \$100 Million in Economic Potential



In a major step toward advancing Pakistan's blue economy, the Ministry of Maritime Affairs has launched an ambitious project to modernize the Korangi Fish Harbour (KOFHA).

The initiative is projected to generate over \$100 million in direct and indirect economic activity within the next five years and serve as a catalyst for sustainable growth, job creation, and international competitiveness in the fisheries sector.

Under the leadership of Federal Minister for Maritime Affairs, Muhammad Junaid Anwar Chaudhry, the transformation of KOFHA is positioned as a strategic cornerstone in Pakistan's maritime development. The modernization effort is expected to create over 3,000 new jobs across key sectors including construction, logistics, fish processing, and fishing—marking a significant boost to coastal employment and local livelihoods.

"This initiative will not only uplift the fisheries sector but also contribute mean-

ingfully to Pakistan's \$375 billion GDP," said the minister. "It aligns with our broader vision to strengthen the maritime economy and drive long-term national growth."

A Modernized Vision for Sustainable Growth

At the heart of this transformation is the revamp of the fish auction hall, which will be equipped with modern facilities to improve operational efficiency, ensure transparent trade practices, and raise hygiene and handling standards to meet international food safety and export requirements. This will enable greater access to global seafood markets, positioning Pakistan as a more competitive player in the international fisheries trade.

A new floating jetty is also in the pipeline, designed to expand harbour capacity by enabling smoother docking, faster unloading, and reduced vessel turnaround time. In parallel, the existing jetty infrastructure will undergo a comprehensive upgrade, including enhanced structural integrity, improved accessibility, and the integration of smart technologies to support evolving maritime and fisheries needs.

Sustainability will be a

core focus throughout the project. The modernization blueprint includes measures to protect marine biodiversity and ensure environmentally responsible harbour operations, aligning economic development with ecological stewardship.

Building a Model for National Replication

Highlighting the broader strategic importance of the initiative, Minister Junaid Anwar Chaudhry stated, "The Korangi Fish Harbour transformation is more than an infrastructure upgrade—it's a commitment to unlocking Pakistan's maritime potential. This model project is expected to drive investment across the fisheries value chain, boost seafood processing capacity by 50%, and lay the foundation for future development of other harbours nationwide."

By upgrading KOFHA into a model fisheries hub, the government aims to stimulate regional economic development, enhance global export readiness, and improve standards of living in coastal communities. The initiative is also expected to spur innovation, attract private sector investment, and establish Korangi as a blue-

print for sustainable and scalable fisheries development across the country.

As part of the ministry's long-term vision, similar

modernization efforts will be extended to other harbours and coastal regions, contributing to a comprehensive transformation of Pakistan's

fisheries infrastructure and further solidifying the country's presence in the global maritime economy. - ERMD

Pakistan Hosts International Conference to Tackle Geological Hazards

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experts from Pakistani universities, UNESCO Pakistan, the Aga Khan Agency for Habitat, and the Pakistan Engineering Council, all of whom hosted dedicated sessions. A major highlight was the launch of the 2025

edition of Pakistan's Tectonic Map, an updated and crucial tool for hazard assessment. In addition, Letters of Cooperation were signed with several key stakeholders to promote collaborative research and risk management initiatives.

By the conclusion of the conference, participants unanimously agreed to collaborate on geological hazard research and advance national-level programmes focused on earthquake and landslide risk assessment and mitigation. ■

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Pakistan Bets on Crypto Mining: 2,000MW Power Allocation Raises Strategic Questions

By: Farhan Mujeeb

Pakistan's energy sector is undergoing a profound transformation, not merely because of the grassroots solar revolution reshaping power dynamics, but due to a bold policy shift by the government: the allocation of 2,000MW for cryptocurrency mining. In a country where electricity shortages, circular debt, and aging infrastructure remain unresolved issues, this high-stakes bet on crypto is a watershed moment, signalling a new phase in Pakistan's energy and economic strategy.

Unlike previous assumptions that a sudden influx of solar capacity would organically push Pakistan toward innovative demand sources like crypto, the government has taken a top-down approach. This policy-driven decision to reserve a massive block of power for digital currency mining is intended to diversify revenue streams, attract foreign investment, and utilize untapped electricity, especially during periods of surplus. But the move raises as many ques-

tions as it aims to answer, particularly in a power sector already grappling with structural imbalances.

Over the past few years, Pakistan has witnessed an unexpected solar boom. Once the preserve of a few eco-conscious homeowners, solar panels now line urban rooftops, industrial warehouses, and even farmlands. Net-metered capacity has surpassed 1,500MW, a

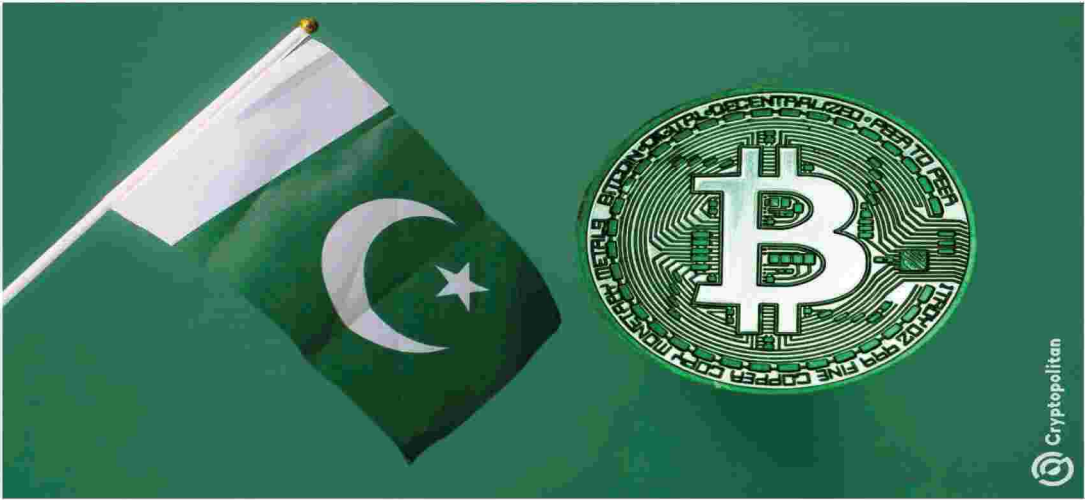
At first glance, the logic appears sound. Crypto mining, particularly Bitcoin, requires immense computational power and operates best when paired with consistent and cost-effective electricity. Allocating 2,000MW equivalent to several large power plants will position Pakistan as a serious contender in the global crypto mining ecosystem, potentially rivaling nations like Kazakhstan or Russia

Venezuela, illustrate the perils of poorly regulated crypto mining, where informal operations overwhelmed fragile grids, contributed to blackouts, and fuelled inflationary pressures due to increased power costs for ordinary consumers.

Pakistan's decision to support crypto mining need not be counterproductive, but it must be accompanied by a strategic framework. Rather than simply allocating 2,000MW, the government could develop criteria to ensure that mining operations are grid-supportive, not grid-disruptive. One critical element is location-based siting, where mining facilities are established near dedicated renewable energy zones or solar parks. This approach minimizes transmission losses and avoids overloading the national grid's core corridors. Additionally, dynamic load management should be a central requirement. By operating as dispatchable demand, mining operations could scale their activity based on real-time grid conditions, ramping up during midday solar surpluses and scaling down during peak evening demand. To further align operations with grid needs, time-of-use pricing can be introduced. Through smart tariffs, miners would be financially incentivized to consume electricity when it is most abundant, thereby reducing the curtailment of solar generation. Collectively, these measures can transform crypto mining from a potential burden into a valuable tool for managing Pakistan's decentralized and increasingly solar-powered grid.

Pakistan's 2,000MW allocation for crypto mining is not just an energy decision, it's a broader economic gamble. At best, it could signal a new era where digital economies complement green energy, offering revenue, employment, and technological advancement. At worst, it risks becoming another strain on an overburdened power system, with limited returns and significant externalities.

Success will depend not on the existence of surplus power but on the sophistication of policy design, regulatory enforcement, and technical execution. As Pakistan navigates this bold new terrain, the decisions made today will shape not only the future of crypto mining but the trajectory of the nation's energy transformation for decades to come.



decentralized, citizen-led energy surge that challenges conventional planning outlined in documents like the IGCEP 2024-2034. This growth has created daytime surpluses, especially in Punjab's industrial zones, even as power shortages remain a nightly ritual across much of the country.

that have adopted similar strategies.

However, this approach introduces new complexities into an already strained energy system.

Pakistan's surplus generation is neither consistent nor evenly distributed. Regions like Punjab experience midday excesses thanks to industrial-scale rooftop solar, while provinces like Balochistan, rich in solar potential but lacking infrastructure, remain largely untouched by the boom. Allocating 2,000MW for a single demand segment, crypto mining could worsen regional disparities if facilities are clustered in better-served provinces.

More critically, the national grid is ill-prepared for dynamic, bidirectional power flows and high-load operations like crypto mining. Concentrated energy demand of this magnitude could overload localized infrastructure, disrupt voltage profiles, and necessitate the continued use of costly fossil fuel plants for reliability, undermining both economic and environmental goals.

Guaranteeing power for crypto mining also introduces risks to the broader energy market. If mining operations secure preferential tariffs or transmission rights, it could distort pricing mechanisms and discourage further private investment in renewable generation. Industrial consumers who have invested in solar may feel sidelined, particularly if mining operations are subsidized or prioritized during grid constraints.

Moreover, experiences from other developing countries, including Iran and

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Targeting Technical and Professional Initiatives ASHRAE Pakistan Chapter Advances Industry Excellence

The ASHRAE Pakistan Chapter, under the leadership of its President, Mahmood Ahmad, concluded a successful series of technical engagements and capacity-building initiatives this May.

These activities reflect the Chapter's ongoing commitment to ASHRAE's mission of promoting sustainability, innovation, and knowledge exchange within the HVACR and building

services sectors in Pakistan. With a focus on technical development, peer learning, and applied industry practices, the Chapter continues to strengthen its role as a platform for empowering engineers, consultants, and professionals across the country.

Industry Dinner: Dialogue, Fellowship, and Community Building

The ASHRAE Pakistan Chapter hosted an exclusive industry networking dinner, bringing together its Board of Governors, senior engineers, consultants, and long-stand-

ing members for a meaningful evening of exchange and fellowship.

President Mahmood Ahmad underscored the importance of a collaborative professional community in his address and outlined the Chapter's renewed focus on technical education, regional outreach, and cross-sector engagement. The dinner served as a valuable platform for members to connect, discuss shared challenges, and explore future initiatives aligned with ASHRAE's global goals. - PR

MUET Wins 3rd Place at Huawei ICT Global Final 2024 - 2025

By: Dr. Faheem Yar Khawar

Jamshoro/Shenzhen, May 27, 2025—In a landmark achievement that underscores Pakistan's growing prowess in information and communication technology, Mehran University of Engineering and Technology (MUET), Jamshoro, has secured third place at the Huawei ICT Competition 2024–2025 Global Final, held at Huawei's global headquarters in Shenzhen, China.

The Huawei ICT Competition, now considered one of the world's largest and most competitive technology contests for students, aims to foster digital talent and innovation among the youth across the globe. Since its inception in 2015, the competition has rapidly grown in scale and influence, attracting participants from top academic institutions worldwide.

A Global Gathering of Future Tech Leaders

This year's edition saw a record-breaking participation of over 210,000 students and faculty members from more than



2,000 universities spanning 80 countries and regions. The event culminated in the global final, where 179 top-performing teams from 48 countries competed for the top accolades.

The final examination round was held on May 21, 2025, followed by the awards and closing ceremony on May 24, 2025, in Shenzhen.

Pakistan Shines on Global Stage

Representing Pakistan as part of the Middle East, Central Asia & Pakistan regional team, the duo of Tahseen Ahmed from TL-MUET and Muhammad Ishaque from Sindh Agriculture University showcased exceptional technical skills, collaboration, and problem-solving capabilities. Their teamwork and performance propelled them onto the global winners' podium, securing 3rd position overall.

Top Three Global Winners

The top positions at this year's global final were as follows:

First Place – Tsinghua University, China

Second Place – University of São Paulo, Brazil

Third Place – Mehran University of Engineering and



Technology (MUET), Pakistan

A Legacy of Excellence

MUET's success at the Huawei ICT Competition builds on its growing legacy of international recognition. Known for its strong emphasis on innovation, technical education, and industry collaboration, MUET has consistently worked to prepare its students for global challenges in science and technology.

Speaking on the achievement, MUET leadership hailed the students' performance as "a testament to the university's commitment to nurturing future leaders in technology and engineering."

The university also acknowledged Huawei's contribution



to developing ICT talent through global outreach, training programs, and competitions that bridge the gap between academia and industry.

About the Huawei ICT Competition

First launched in 2015, the Huawei ICT Competition is a flagship initiative of Huawei's Talent Ecosystem Development program. It aims to provide a global platform for university students to enhance their ICT knowledge, practical skills, and innovation capacity. Participants undergo rigorous rounds of exams, hands-on labs, and real-world problem-solving scenarios.

Through this competition, Huawei aims to help meet the growing global demand for digital skills and inspire young people to contribute to the digital economy. – ER/PR

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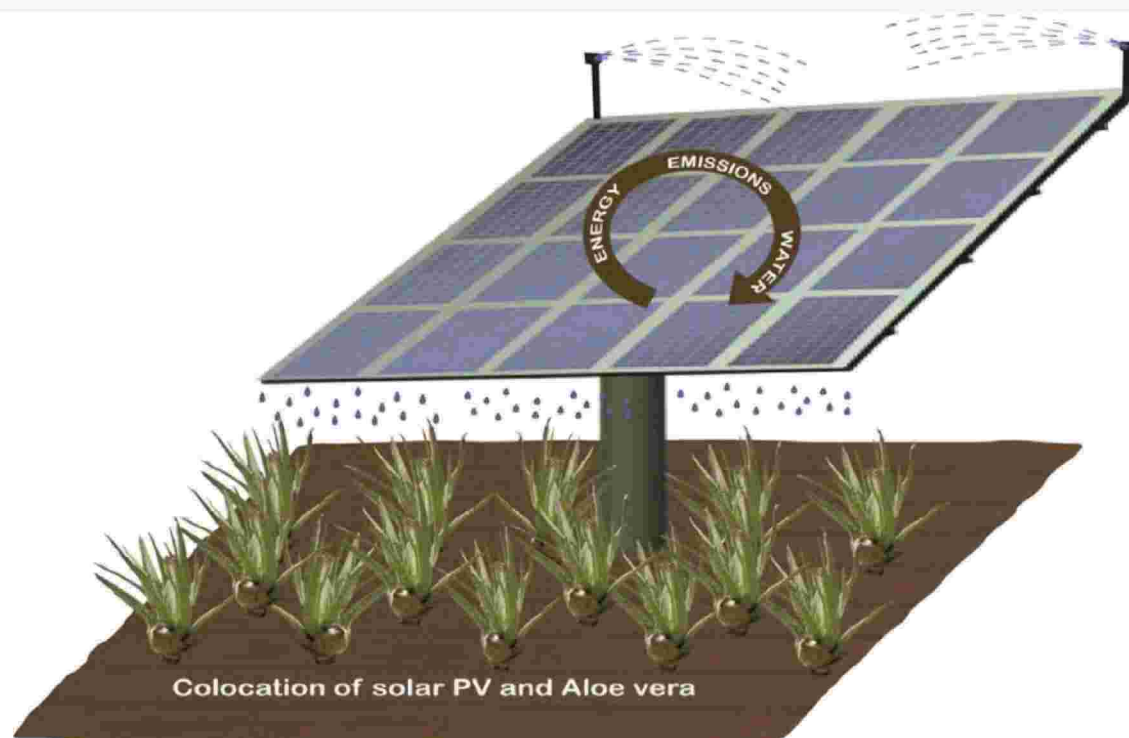
Humans' relationships with plants is largely utilitarian, serving our needs. We generally either eat them or make things out of them. Researchers in the College of Human Ecology (CHE) have developed a design and fabrication approach that treats these living things companions to humans, with seeds woven into hydrogel material for hairbands, wristbands, hats and sandals, among other applications. The seeds grow into sprouts if taken care of properly.

Synchronizing Photovoltaic Systems with Agriculture

Photovoltaic systems are increasingly being installed not only on roofs but also on open land. This does not always meet with citizens' approval.

What is known as agrivoltaics (Agri-PV), however, is viewed more favorably, as researchers at the University of Bonn have now been able to show.

In this case, the solar cells are installed in spaces used for agriculture—such as on pastures or as a canopy over grapevines. According to a survey of almost 2,000 people, this form enjoys much higher acceptance than normal solar parks. The study has been published in the journal Land Use Policy.



lished in the journal Land Use Policy.

Solar electricity is an important environmentally friendly energy source. However, the light-sensitive panels swallow up a great deal of space. Many citizens also consider the systems to be unattractive and annoying—especially if arable land and grassland have been sacrificed for them.

One alternative is what is known as agrivoltaics. This involves installing the panels on land that continues to be used for agriculture—grain fields, pastures, apple orchards, or vineyards.

"They usually reduce the yield," explains Hendrik Zeddes from the Center for Development Research (ZEF)

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Matco Foods to Carve Out Corn Starch Division into Wholly Owned Subsidiary

Matco Foods Limited, one of Pakistan's leading agri-based processing companies, has announced a strategic corporate restructuring plan that includes the demerger of its Corn Starch Division into a wholly owned subsidiary, Matco Corn Products (Private) Limited (MCPPL).

The move is part of the company's broader strategy to enhance operational focus and explore capital-raising options.

The decision was formally approved by the company's Board of Directors through circular resolutions passed on

May 23, 2025, and communicated to the Pakistan Stock Exchange (PSX).

With a legacy spanning over five decades, Matco Foods has established itself as a major player in the food industry, particularly known for its premium rice processing and exports. Headquartered in Karachi, the company has diversified into value-added products including rice glucose, rice protein,

and organic foods, positioning itself as a vertically integrated food solutions provider.

According to the notice issued to the PSX, the restructuring will involve the transfer of certain assets, liabilities, obligations, and undertakings related to the Corn Starch Division to MCPPL. The draft Scheme of Arrangement has been prepared under Sections 279 to 283 and 285(5) of the Companies Act,

2017, outlining the terms of the proposed transaction.

In consideration of the arrangement, shares of MCPPL will be issued in favor of Matco Foods. The restructuring is subject to shareholder, creditor, and regulatory approvals, along with

sanctioning by the Honourable High Court of Sindh and fulfillment of all legal formalities.

The company also noted that any required amendments or changes to the scheme may be introduced as deemed necessary.

The scheme will be circulated to PSX and the company's shareholders in due course, in accordance with applicable laws. - ER Report



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Synchronizing Photovoltaic Systems with Agriculture

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at the University of Bonn. "However, they sometimes also create synergies. For example, the solar cells can be used as a transparent canopy to protect fruit trees or grapevines from hailstones or harsh sunlight. On wheat fields, they often serve as wind protection—similar to a wall or a hedge."

Cows graze between solar panels

The study also shows that agrivoltaics offers a further advantage that should not be underestimated: It clearly enjoys much greater acceptance among the public than conventional solar parks. This is at least what the results of an online survey involving almost 2,000 people in Germany indicate. Zeddies is one of its initiators, alongside his colleagues Dr. Martin Parlasca and Prof. Dr. Martin Qaim, Director of the ZEF.

The respondents were chosen in such a way that their composition with regard to age, sex, education, income, and state of residency reflected the German population. They were initially given information on the advantages and disadvantages of agrivoltaics and conventional solar parks on open land.

They were then assigned at random to one of three groups. The first saw photos of a pasture, and as a comparison, a

meadow in which long rows of solar panels stood between the grazing cows. Similarly, the second group looked at pairs of images of a wheat field with and without solar panels, the third of a vineyard. These images were each compared with pure solar parks in the same landscape scene.

"We asked the participants how they assessed the intervention in the respective landscape," explains Zeddies. "For instance, how attractive or unattractive they found the areas shown or how they assessed their recreational value." In addition, they were asked to state whether they would be willing to accept a price premium for the electricity produced in the respective areas—or the reverse: whether they would pay money to prevent the solar park.

Almost 44% would pay more for agrivoltaic electricity

The results show that agrivoltaics met with much higher acceptance—regardless of the scenario shown: Almost 44% would pay more for electricity from these areas; however, only 29% would be willing to do so for normal solar parks on open land. Just 2.9% would also finance measures to prevent agrivoltaics from their own pockets. The figure was 4.8% for conventional parks.

Although the respondents were generally of the opinion that photovoltaics

impair the view of the landscape, these negative impacts were lower in their eyes when it came to agrivoltaics—presumably because it makes a difference whether solar energy production is pushing agriculture aside or whether energy and food production are combined.

"Our survey is hypothetical—the participants do not really have to spend any money," stresses Prof. Dr. Martin Qaim, who is also a member of the Transdisciplinary Research Area (TRA) Sustainable Futures and the Cluster of Excellence PhenRob. "Nevertheless, the results allow us to conclude that agrivoltaics meets with greater acceptance among the public than normal open-space solar systems."

Agrivoltaics could therefore be a way to accelerate the development of environmentally friendly energy without provoking major conflicts among the population and jeopardizing food security.

However, Zeddies, who himself grew up on a farm, still sees unanswered questions. For instance, the costs of these systems are higher than for conventional open-space systems. As agrivoltaics also delivers lower electricity yields, these initial investments only amortize very slowly.

"Without subsidies, it will presumably not be possible to install many systems," he says. -- ERMD

Pakistan Shifts Gears Toward Green Energy Amid Decline in Fossil Fuel Dependency

Pakistan is witnessing a notable shift toward cleaner and more sustainable energy sources, as highlighted in the recently released Pakistan Energy Year Book 2023–24 by the Hydrocarbon Development Institute of Pakistan.

The report underscores a transformative year in which the country made significant progress in green energy adoption, local energy production, and reducing reliance on imported fossil fuels.

While the country's total energy consumption fell by 6.47% in FY2023–24, this decline coincided with a major increase in clean and domestic energy sources. Hydropower generation surged by 8.94%, reaching nearly 40,000 GWh—up from 36,643 GWh in the previous year—demonstrating Pakistan's growing reliance on renewable resources.

Other renewable energy sources, such as solar, wind, and bagasse, collectively contributed to 45,617 GWh in electricity generation. Importantly, the installed renewable energy capacity also saw a modest but encouraging increase of 72 MW, reflecting continued investment in sustainable energy infrastructure despite overall electricity generation declining from 139,380 GWh to 136,278 GWh.

One of the strongest indicators of green momentum came from LPG and LNG. LPG supply rose by 16.98%, and LNG imports increased by 13.19%, both of which are cleaner alternatives to traditional fuels. Additionally, domestic coal production jumped by an impressive 28.28%, which—while not renewable—points to a broader shift toward local energy independence. Hydropower and nuclear energy

remained essential components of the cleaner energy mix. Although nuclear power generation dipped slightly (by 3.7%), the sharp 7.4% drop in fossil fuel-based electricity generation and a 21% decline in electricity imports highlighted reduced dependence on external and environmentally harmful sources.

At the policy level, the government's efforts to curb oil dependency saw success: the import of petroleum products dropped by 18.86%, crude oil by 4.3%, and overall oil consumption by over 9%. The biggest reductions were recorded in furnace oil (down 47.45%) and motor spirit (down 4.44%), aligning with a national strategy to phase out carbon-intensive fuels.

Meanwhile, the growing demand for green fuel alternatives was seen in the 50.16% increase in Light Diesel Oil (LDO) for agriculture and a 22.68% rise in high-octane fuel consumption.

Domestically, indigenous energy production rose to 53 million tonnes of oil equivalent (MTOE), while energy imports dropped from 33 MTOE to 30 MTOE, illustrating an encouraging move toward energy self-reliance.

"This is a decisive step in reshaping Pakistan's energy landscape," the report notes. "Our commitment to green energy, domestic production, and technological investment is laying the foundation for a more secure and sustainable energy future."

With the government's ongoing emphasis on clean energy, local manufacturing, and efficient consumption, Pakistan is poised to continue its transition toward an energy system that is not only more affordable and secure but also aligned with global environmental goals. — ER Report



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Developing a Scalable Entrepreneurial Approach in Engineering and Technology Projects

Engr. Dr. Muhammad Nawaz Iqbal

Transitioning from academic or localized problem-solving toward a broader market perspective is critical to developing scalable entrepreneurial approaches in engineering and technology projects.

The starting point is identifying a huge gap in industry or society that can be addressed through innovative engineering. From the very first stage of the ideation process, entrepreneurs must think in terms of replicability, adaptability, and cost-effectiveness—something quite different from designing one-off solutions. It speaks about incorporating lean start-ups into engineering projects. This efficiency is through rapid prototyping and the use of minimum viable products (MVP) to validate early assumptions quickly and gather live feedback. Such a feedback loop aligns the project with market needs and minimizes the risk "to create products ultimately doomed to be mere artifacts because there's no demand for them, or, worse, usability problems". The modularity for the entire system is very important in terms of scalability, and engineering solutions should be executed so that the components could be independently upgraded, replaced, or scaled. This would allow the system to evolve, with minimal disruptions, thereby reducing the overall cost or effort in extending its use or improving its features.

Collaboration between engineering and business students or professionals develops a multidisciplinary mindset needed for scalability. Quite often, technologists ignore marketing, regulatory, and financial constraints. A combined effort ensures full project development spanning from the technology to a unique selling proposition, revenue models, and possible scalability avenues.

Another major area where technology ventures scale is intellectual property (IP) planning. Although it is early recognition and protection of ingenious components from copycats, their early development gives confidence to investors about the long-term potential of the innovation. A well-documented IP portfolio can become an excellent asset if one is seeking potential partner engagements or licensing and acquisition deals. Cloud-based



integrated IoT systems are very promising, scalable engineering solutions in terms of monitoring, collecting data and software updates remote and wide-scale. With these cloud functions enabled, start-ups can have centralized control of different dispersed systems with lowered operational costs and increased reliability and customer satisfaction.

Strategic usage of open source frameworks to construct community-driven development around the project is possible. A project built by developer contributions and users will quickly evolve and naturally develop a loyal user base. But this needs to be balanced with revenue models such as premium features, support services, or an enterprise solution. The manufacturing of chemicals and consumables require a streamlined supply

chain and efficient manufacturing plans for scalability. Since entrepreneurs are required to see their inventions created in the market from scratch, they must engage with vendors early to come up with the estimate of cost and logistics in terms of the mass production. Design for manufacturability (DFM) and design for assembly (DFA) are two important engineering terms that will help design engineer in the transition from prototype to mass

production. The accessibility to accelerators, incubators, as well as funding networks can greatly increase the potential for scalability of an engineering startup. Not only do these platforms give us financial resources, but they mentor us, open the door to industry and help us gain validation. For instance, entrepreneurs ought to partner in such ecosystems to gain credibility and accelerate their project development and market entry. Development process should be embedded data driven decision making. Analyzing the interaction of the user helps you optimize the features, make them more usable, and know what to work on first. Their product feedback cycle is, thus, a continuous one, making the product stay up to date and competitive as user needs, or the market change. Sustainability and thinking of

environment impact can increase the scalability of those particular technology projects. Policies that cover environmental concerns, green regulations or carbon footprints are more likely to find funding and adapt to and across regions with harsh environmental policies. Embedding eco-efficiency in the engineering design process is thus the means to create long-term value. Localization and customization capabilities are crucial for scaling out the technology projects into various regions. The engineering solutions must be able to adjust to the nuances for different regulators, language preferences, and cultures. This flexibility permits rapid progress into the new markets with few modifications, which naturally increases the ratings of the project.

Scalable implementation requires reading robust documentation and training material. When the product or solution start spreading, onboarding new customers or users becomes an issue. Though there are user guides, support videos and other technical documentation available to help everybody adapt with ease; they'd cut the need for core team members on some of the basic support activities. Finally, a vision-driven culture in the engineering project team needs to be cultivated. Teams that share a purpose seem to be more resilient, more innovative and more aligned. This culture promotes continuous user-centric innovation and adaptation to change over time and makes this possible at a long-term time length. ■



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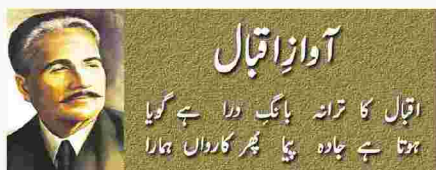
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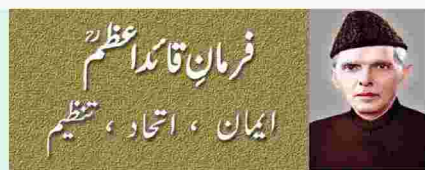
آوازِ اقبال کا ترانہ بانگ درا ہے گویا ہوتا ہے یادہ پکا نیر کارواں ہمارا

آہ! یہ دست جو اے گل رنگیں نہیں کس طرح تجھ کو یہ سمجھاؤں کہ میں گل چیں نہیں کام مجھ کو دیدہ حکمت کے انجیروں سے کیا دیدہ بلبل سے میں کرتا ہوں نظارہ تر

تو شائے خراش عقدہ مشکل نہیں اے گل رنگیں ترے پہلو میں شاید دل نہیں زیب محفل ہے شریک شورش محفل نہیں یہ فراغت بزم ہستی میں مجھے حاصل نہیں اس چمن میں، میں سراپا سوز و ساز آرزو اور تیری زندگانی بے گداز آرزو توڑ لینا شاخ سے تجھ کو مرا آئیں نہیں یہ نظر غیر از نگاہ چشم صورت میں نہیں

پوری کوششیں کرنی چاہیے۔ جو لوگ فی الحال لاہور کی قرارداد پاکستان کے خلاف ہیں، ہمیں ان کے دل میں غیر ضروری تلخی پیدا نہیں کرنی چاہیے۔ آخر ہمیں ضرورت ہی کیا ہے؟ مجھے پورا پورا یقین ہے کہ ہمارے یہی حریف ایک نہ ایک دن محسوس کر لیں گے کہ ہندوستان کے انتہائی پیچیدہ مسئلے کا واحد اور بہترین حل قیام پاکستان ہے کہ جس کے قیام کی نظیر پوری دنیا کی تاریخ میں نہیں ملتی۔

(پنجاب مسلم سٹوڈنٹس فیڈریشن۔ 2 مارچ 1947ء)



آزادی اور قربانی

جس جہاں تک ممکن ہو ہمیں اپنے حریفوں کو سمجھانے کے لئے عقل اور دلیل سے کام لینا چاہیے۔ میں جانتا ہوں کہ دلیل اور عقل ہمیشہ ہی کامیاب نہیں ہوتیں لیکن ہمیں اپنی طرف سے

Abacus hosts British HC delegation to strengthen UK-Pakistan tech collaboration

Abacus, a leader in delivering worldclass technology, outsourcing, and consulting solutions, was honoured to host a distinguished delegation from the British High Commission at its Lahore BPO office on 24th May.

The delegation, led by Jane Marriot CMG OBE – British High Commissioner to Pakistan – included Ben Warrington, Head of the Lahore Office, and Mrs Reema Salman, Chevening Alumni Engagement Officer. The visit underscored shared ambitions to deepen technology collaboration and economic ties between the UK and Pakistan.

The delegation engaged with Abacus's leadership team, including Ms Fatima Asad-Said – CEO of Abacus, Faeza Khan – Chief Strategy Officer, and Sha-

heryar Rafiq Butt – Global Head of the BPO Division, along with other senior executive leaders, to discuss opportunities for expanding IT and technology partnerships. Discussions focused on Abacus's

potential UK interventions to support Abacus's expansion, including skills development, digital transformation, and cross-border tech engagements. The delegation also had the opportunity to visit Aba-

said: "Abacus is a fantastic example of how strong UK-Pakistan partnerships can reap benefits for both countries. Both the UK and Pakistan's IT sectors are powerhouses of talent and innovation. There is huge potential to be found in collaboration."

Fatima Asad-Said, CEO of Abacus, remarked: "This visit reaffirms the strategic importance of the UK as a pivotal market for Abacus. We are poised to scale our impact through partnerships that leverage British expertise and Pakistan's tech prowess.

We appreciate the High Commissioner's proactive engagement and look forward to translating these discussions into impactful collaborations." – PR



footprint, AI-driven cutting edge technology solutions and reviewing its current operations and future growth strategies in the UK market. The strategic dialogue aligned on

cus's outsourcing capabilities and innovative infrastructure to identify synergies with British firms.

British High Commissioner, Jane Marriot CMG OBE,

Sales Blog for Young Engineers and Entrepreneurs

PITFALLS OF COMPETITOR BASHING:

Muhammad Tariq Haq | ESL

In today's competitive business landscape, the temptation to gain an edge by criticizing competitors can be strong.

However, this approach—commonly known as "competitor bashing"—often backfires in ways that damage not only immediate sales opportunities but also long-term business relationships and reputation.

The Foundation of Effective Selling

Successful selling should always be built upon the merits of your own product or service. When salespeople focus on communicating their unique value proposition, demonstrating how they solve customer problems, showcasing their strengths, they create a positive impression on potential buyers.

In contrast, when a salesperson resorts to bashing competitors, they inadvertently shift the conversation away from their own offerings and toward the competition. This raises questions about why the salesperson isn't confident enough to win based on their own merits.

Undermining Customer Confidence

Speaking ill of competitors is one surefire method of losing customers' confidence. Several concerning dynamics come into play:

1. Respect for customer choices: Many prospects may have previously purchased

from or considered your competitors. By criticizing these companies, you risk insulting the customer's decision-making abilities.

2. Professionalism concerns: Negative selling tactics often make the salesperson appear unprofessional, desperate, or lacking in integrity.

3. Credibility questions: Customers naturally wonder if someone willing to speak poorly about others might also be dishonest

incorrect information to competitors crosses ethical boundaries and can have serious moral, ethical and legal consequences.

Even if a salesperson "wins" a deal, the victory is typically short-lived as the truth eventually emerges.

Desperate Tactics in Tight Markets

When deals are few and far between, some salespeople resort to desperate measures to secure business by any means necessary.

These efforts to steal business "by hook or crook" reflect poorly on both the individual salesperson and their organization.

The Long-Term Cost of Short-Term Gains

While bashing competitors might occasionally win a deal or two, Salespeople who regularly engage in negative selling:

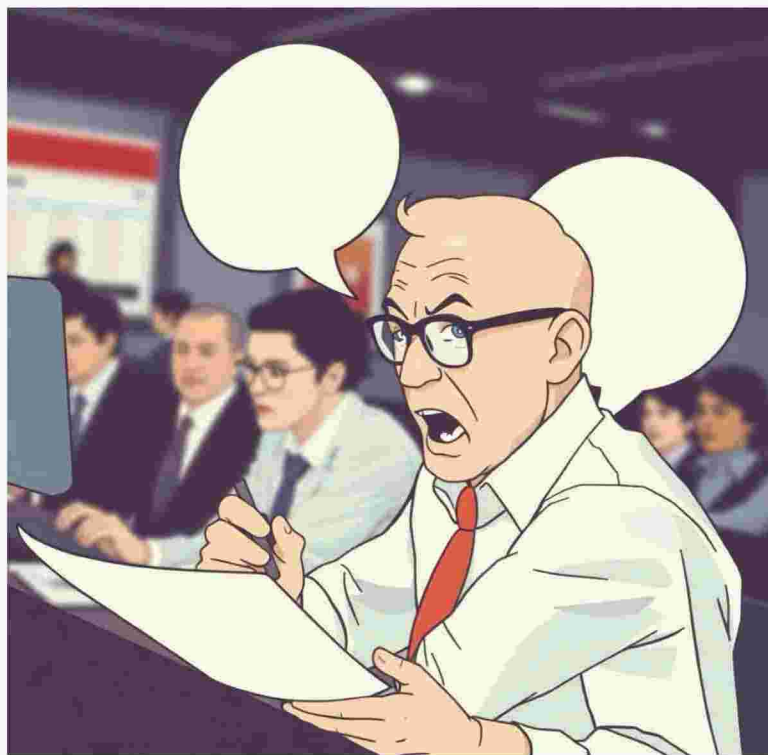
- Develop a reputation for unprofessional behavior
- Find it increasingly difficult to build trust with new customers
- May face backlash when competitors respond in kind

Instead of criticizing competitors, successful salespeople:

1. Focus on differentiation: Clearly articulate what makes your offering unique and valuable without directly

criticizing alternatives.

2. Let customers make comparisons: Provide information that allows customers to draw their own conclusions about competitive differences. ■



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Cool computing—why the future of electronics could lie in the cold

Modern computer chips generate a lot of heat and consume large amounts of energy as a result.

A promising approach to reducing this energy demand could lie in the cold, as highlighted by a new Perspective article by an international research team coordinated by Qing-Tai Zhao from Forschungszentrum Jülich. Savings could reach as high as 80%, according to the researchers.

strategies.

Data centers already consume vast amounts of electricity—and their power requirements are expected to double by 2030 due to the rising energy demands of artificial intelligence, according to the International Energy Agency (IEA). The computer chips that process data around the clock produce large amounts of heat and require considerable energy for cooling. But what if we flipped the script? What if the key to energy efficiency lay not in managing heat, but

Conventional chips can also benefit from powerful cooling. However, they are only suitable for truly cryogenic operation to a limited extent.

Transistors like it cold, actually. "Transistors account for a large proportion of the power consumption in computers," says Zhao. These tiny switches—modern chips often contain several billion per square millimeter—require a certain voltage to switch between on and off. At room temperature, around 60 millivolts are required to modify the cur-

Less voltage means less energy, less heat, and greater efficiency.

In fact, studies show that at 77 Kelvin (-196.15°C)—a temperature still achievable using liquid nitrogen cooling—energy savings of up to 70% are possible. This remains true even when the energy needed for cooling is factored in. With helium-based cooling at 4 Kelvin, savings could reach as high as 80%, according to the researchers.

Theory vs. practice
However, the reality is

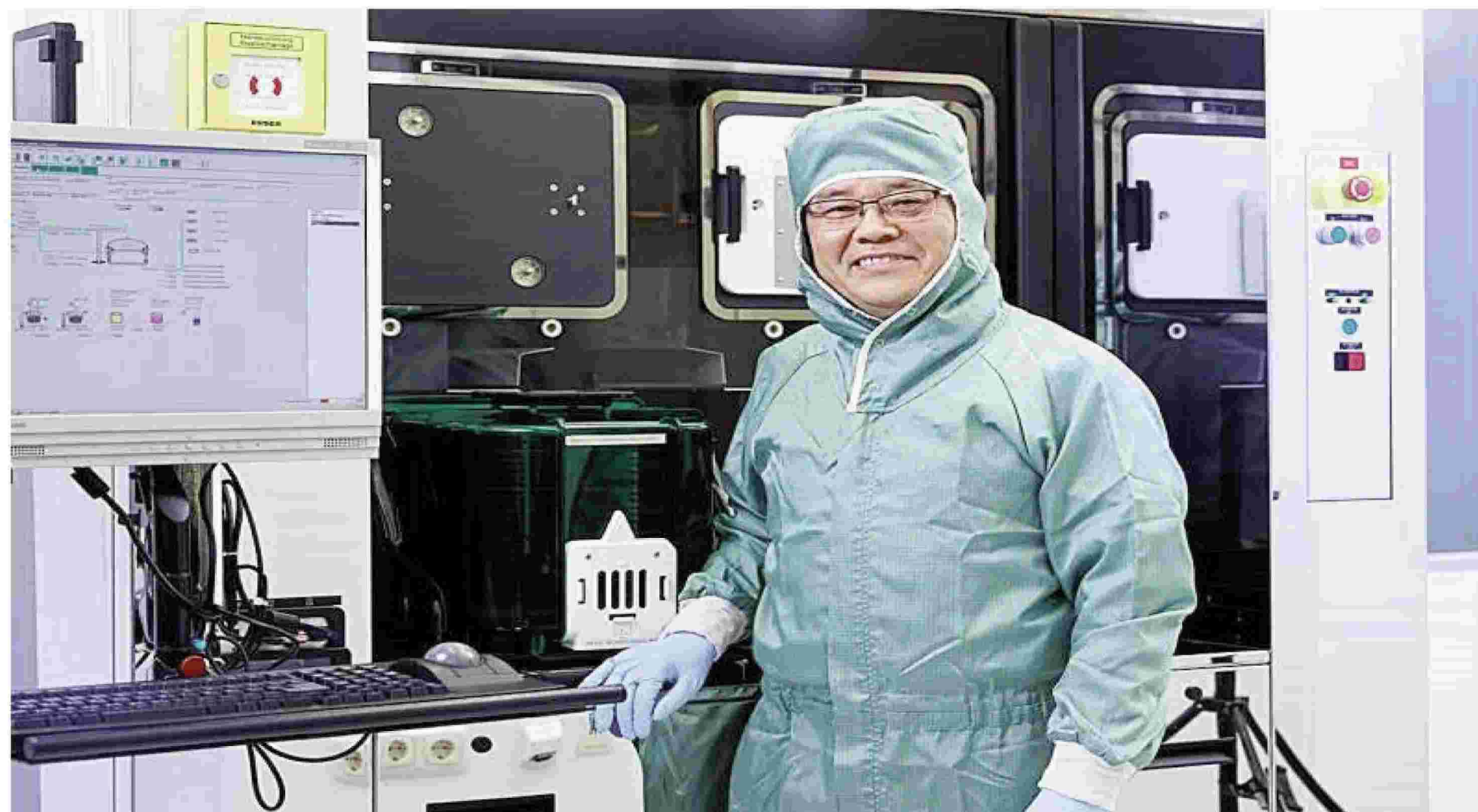
In addition, there's source-drain tunneling, a quantum phenomenon in which electrons pass directly through the barrier region. Together, these effects prevent the subthreshold swing from decreasing as much as expected. Instead of reaching values below 1 millivolt per decade, the subthreshold swing typically settles between 5 and 10 millivolts per decade at temperatures below 20 Kelvin—far too high to achieve the energy efficiency theoretically possible.

CMOS technology with new materials or with integrating re-evaluated known materials," as Knoch explains.

In their study, the researchers propose a whole range of technologies that, in combination, could enable a kind of "super transistor for the cold." These include:

Gate-all-around nanowires and fully depleted Silicon-On-Insulator (SOI), which enable particularly precise control

High-k dielectrics with very high dielectric constants in combination with sub-



The work was conducted in collaboration with Prof. Joachim Knoch from RWTH Aachen University and researchers from EPFL in Switzerland, TSMC and National Yang Ming Chiao Tung University (NYCU) in Taiwan, and the University of Tokyo. In the article published in Nature Reviews Electrical Engineering, the authors outline how conventional CMOS technology can be adapted for cryogenic operation using novel materials and intelligent design

in embracing the cold?

This is the idea behind the concept of cryogenic computing, i.e., computing at very low temperatures. In the future, computer chips could not only work faster but also more efficiently at these temperatures—at least if they are adapted accordingly.

The approach is also interesting for numerous applications such as quantum computers, space probes, and medical imaging, which often require very low temperatures close to absolute zero.

rent by a factor of 10. This value, known as the "subthreshold swing," is a measure of a transistor's switching efficiency—and is highly temperature-dependent.

Traditionally, this switching voltage decreases as the temperature drops. That's because electrons have less thermal energy. They don't "jump" over barriers as easily and behave more predictably overall. Near absolute zero, theoretically only 1 millivolt would be required," Zhao explains.

somewhat different. At very low temperatures, physical phenomena become apparent that are masked by "thermal noise" at higher temperatures. The most notable of these are the so-called band tail effects: energetic disturbances caused by small material disorders or defects, as no semiconductor is perfect. "They prevent transistors from switching off properly," says Zhao. The current continues to "leak" even though the component should actually be blocked.

New materials, new perspectives

The good news is that there are solutions. For example, the use of materials that cannot be used at room temperature has great advantages at very low temperatures. The reason for this is the limited energy range due to the very low temperatures, which is essential for the switching behavior. Ultimately, the realization of cryogenic computing requires "the replacement of materials established in commercial

nanometer thin interlayers, that reduce energetic disorder and efficiently bundle the electric field

Source/drain engineering, which enables steep junction formation and introduces less defects

the use of novel materials such as small band gap semiconductors, which allow switching with lower voltages

so-called back gating, in which the threshold voltage can be dynamically adjusted. ■

Universities face getting stuck with thousands of obsolete robots. Here's how to avoid a research calamity

For more than a decade, the French robotics company Aldebaran has built some of the most popular robots used in academic research.

Go to most university robotics departments and you'll find either Pepper, the iconic three-wheeled humanoid robot, or its smaller two-legged sibling, Nao.

These fast became the robots of choice for many academics for all research into the capabilities and potential of social robots. They are quick to set up and easy to use out of the box, without the need for any programming skills or engineering knowledge.

With base prices at around £17,000 for Pepper and £8,000 for Nao—typically plus a few thousand pounds more for extras, online training sessions, service plans, warranties and so on—the robots could be purchased via university research grants.

With Pepper robots also appearing in customer service jobs, for example in HSBC banks across the US, buyers were attracted by the lure of long-term educational and financial benefits from a state-of-the-art tech supplier. Aldebaran says it has sold approximately 37,000 machines worldwide (20,000 Naos and 17,000 Peppers).

However, the company stopped developing Pepper robots in 2021, having struggled to sell as many as it had hoped, and was offloaded by long-time Japanese owner Softbank.

In February of this year, Aldebaran filed for bankruptcy and restructured amid ongoing financial difficulties. Currently looking for a buyer, it has halved its staff numbers, though it is still making Nao (and a serving assistant on wheels called Plato).

The uncertainty around the company's future has stoked fears that it will become impossible to get its robots repaired in future, and that Aldebaran could stop supporting the AI cloud network that the machines need to access to be able to function.

What does this mean for the future of robotics research in universities?

Besides fears about Aldebaran's future, there have long been issues with Pepper and Nao's durability. They both have rigid, fragile plastic shells, and the machines sometimes overheat. This means they have to be left to cool down after 20-30 minutes, which has often interfered with experiments and data-gathering—as documented in this 2022 study of Nao.

A spokesperson for Aldebaran agreed that motors can overheat, depending on their use and environment. They said the next generation of Nao, currently in development, has taken this into account in its design.

For repairs, the only option is Aldebaran or an authorized reseller, or you risk voiding your warranty. This typically involves shipping overseas, which can be slow and costly—more so if the replacement parts are out of stock.

One of us (Emilia) encountered this during the COVID pandemic. Nao's batteries need to be used regularly to keep functioning, which led the university's machine to fail because it was inaccessible during lockdowns. Aldebaran couldn't supply replacement batteries quickly, which halted research projects at the university for many months and meant that important submission deadlines were missed.

Meanwhile, software upgrades for Pepper stopped when the company halted development in 2021 (sales stopped in 2024). This robot's limited processing capa-

their components or appearance.

Their fixed expressions, gestures and plastic body make them difficult to adapt to different user needs or applications, such as helping at home or in healthcare. This again reduces their usefulness from a research point of view.

Addressing these concerns, the Aldebaran spokesperson said,

"Spare parts availability on Nao is very good, [barring] the normal supply chain issues, and these were exacerbated during COVID like the rest of the commercial world. Pepper is more limited as it has not been in production for some time, but we are generally able to solve any customer issues."

"Nao is still very active as a product, with production continuing along with software

and the software made local and open source, which may be enough to get the robots back up and working again.

However, it probably makes sense for researchers to look forwards instead. But towards what? At a time when university finances are very tight, there may be a reluctance to buy new machines with potentially limited shelf lives. Robots from alternative providers such as Futhat and Unitree are supported by similar cloud-based AI systems.

Some institutions may consider real-locating vital funding to other departments, with a significant impact across robotics research and education. Universities are at the heart of robotics research, upholding high ethical standards and rigorously testing machines without the conflicts of interest that manufacturers can have.

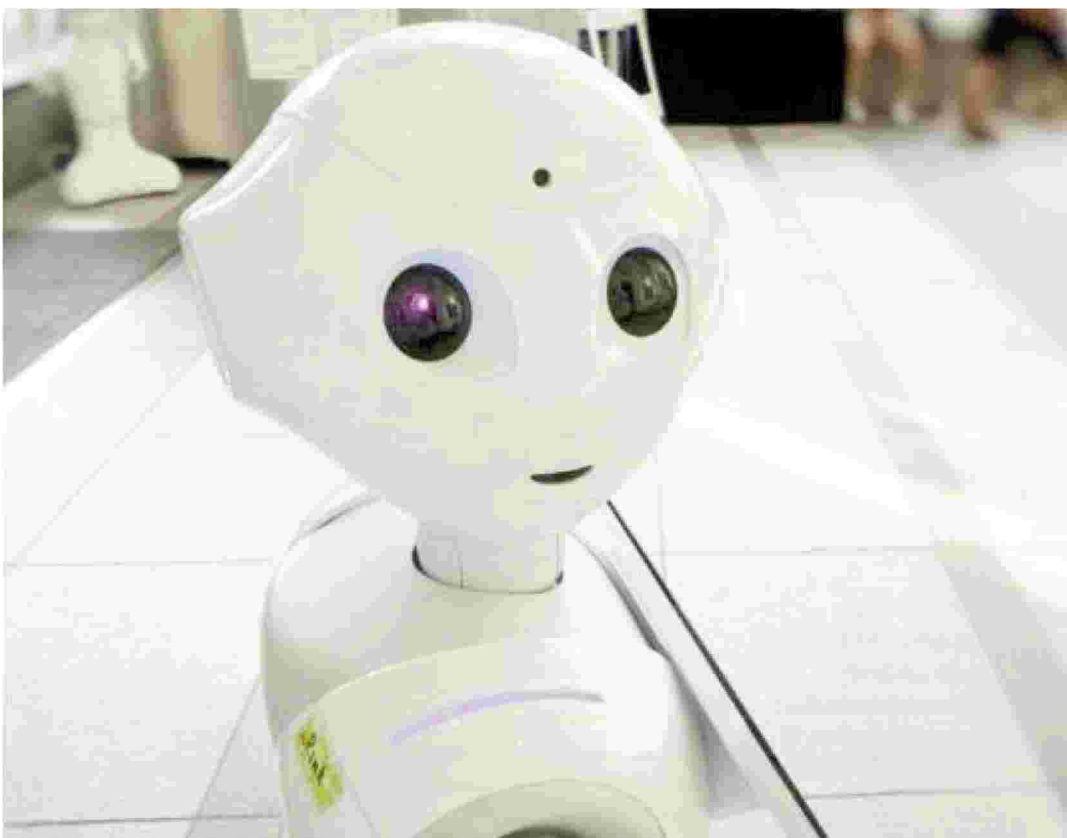
Universities can also bring together diverse disciplines like computer science, engineering and cognitive science, fostering collaboration that encourages innovation. With the UK number one globally for research quality in this field, these are the training grounds for the next generation of roboticists at a time when there is a growing skills shortage.

A different way forward would be for universities to start building and programming robots from scratch. For the cost of a new research robot, say £15,000, you could buy several high-spec 3D printers, hardware and components.

This wouldn't be about building entire humanoid robots but prototypes of key aspects such as facial expressiveness or skin, human gestures or emotions. This would allow students to gain important hands-on engineering and programming skills, while conducting novel research exploring current gaps in the field.

It would make personalizing them easier and repairing them quicker and cheaper, if you could 3D-print parts or use parts that could be easily replaced off-the-shelf.

If universities are to remain relevant in this rapidly evolving field, it's vital that they learn from their difficulties with Pepper and Nao. At a time when robots are starting to be perceived as reliable and cost-effective support for people, this is a cautionary tale for all. - TP



bilities make it troublesome to run the large language models (LLMs) that power interfaces like ChatGPT (although these can be run in conjunction with a computer with modifications).

Nao does have an AI edition that can handle LLMs, though this too requires external modifications. Nao's upgrades also seem to have been limited, which in our experience appears to have made them more error-prone too. Both robots are already considerably less useful for research purposes in our opinion.

Finally, Nao and Pepper were not built with adaptability in mind. Unlike more recent machines like the 3D-printed InMoov, made by French designer Gael Langevin, there's no way of customizing

upgrades. We recently launched Nao Activities, a major software upgrade that provides generative AI capabilities for Nao."

The spokesperson added that there were no plans to switch off AI cloud support for Nao or Pepper, and that the robots are not difficult to use in robotics research, "testament of which is the thousands of units being used in that environment".

What can be done?

If Pepper and Nao do become unusable for research, universities will have to either scrap them or try to redevelop them with custom parts and components. It's possible they could be hacked and gutted, replacement parts could be 3D-printed, new microprocessors installed

AI chip developed for decentralized use without the cloud

A new AI chip developed at the Technical University of Munich (TUM) works without the cloud server or internet connections needed by existing chips.

The AI Pro, designed by Prof Hussam Amrouch, is modeled on the human brain. Its innovative neuromorphic architecture enables it to perform calculations on the spot, ensuring full cyber security. It is also up to 10 times more energy efficient.

The professor of AI processor design at TUM has already had the first prototypes produced by semiconductor manufacturer Global Foundries in Dresden. Unlike conventional chips, the computing and memory units of the AI Pro are located together. This is possible because the chip applies the principle of "hyperdimensional computing": This means that it recognizes similari-

ties and patterns, but does not require millions of data records to learn.

Instead of being shown countless images of cars, as with the deep learning method used in conventional AI chips, this chip combines various pieces of information, such as the fact that a car has four wheels, usually drives on the road, and can have different shapes. Like the new chip, explains Prof. Amrouch, "humans also draw inferences and learn through similarities."

An important advantage of brain-like thinking: it saves energy. For the training of a sample task, the new chip consumed 24 microjoules, while comparable chips required 10 to 100 times more energy—"a

record value," notes Prof. Amrouch. "This mix of modern processor architecture, algorithm specialization and innovative data processing makes the AI chip something special."

This also sets it apart from all-rounders like the chips from industry giant NVIDIA.

"While NVIDIA has built a platform that relies on cloud data and promises to solve every problem, we have developed an AI chip that enables customized solutions. There is a huge market there."

Neuromorphic chips: Modeled on the human brain

The one-square-millimeter chip currently costs 30,000 euros. With about 10 million transistors it is not quite as densely

packed or as powerful as NVIDIA chips with 200 billion transistors. But that is not Prof. Amrouch's primary concern. His team specializes in AI chips that perform the processing directly on site instead of having to send the data to the cloud to be processed along with millions of other data sets before being sent back again. This saves time and server computing capacity and reduces the carbon footprint of AI.

The chips are also customized for specific applications. "That makes them very efficient," says chip expert Amrouch. For example, they focus on processing heart rate and other vital data collected via smart-watch or navigation data of a drone. Because this personal and sometimes sensitive data remains on board the device, issues with stable internet connections or cybersecurity do not even arise. "The future belongs to the people who own the hardware," says Amrouch. - TP

