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Embracing Systems Engineering: Myths, Mindsets, and Milestones

This edition pays homage to National Systems Engineer Day, celebrates the rhythmic brilliance of Fibonacci, and recognizes the contributions of Indigenous Peoples in the realm of systems engineering.

National Systems Engineer Day: Engineering the Future

Mark your calendars for November 24th, 2023! National Systems Engineer Day is more than just a day—it's an ode to the pioneers and professionals streamlining our complex world. Established to honor and educate, this day sheds light on how systems engineering has become the backbone of innovation. From space exploration to accessible everyday devices, systems thinking integrates ideas across disciplines. **Want to join local events or webinars?** Check out the National Systems Engineer Day *official website* to explore happenings near you.

The **Fibonacci sequence**, a simple yet incredibly versatile numerical pattern, plays a pivotal role in systems thinking, offering innovative solutions to real-world challenges. As Fibonacci Day on November 23rd approaches, we delve into how this sequence can be harnessed to optimize resource allocation, enhance process sequencing, manage risks, and analyze data effectively. By integrating the Fibonacci sequence into systems thinking, we unlock a powerful tool for addressing the complexities of our daily

lives. It's a fascinating fusion of mathematics and systems engineering that offers practical problem-solving methods aligned with the natural order of growth all around us.

Indigenous Peoples Heritage: Pioneering Perspectives in Systems Engineering

In November, we celebrate Indigenous Peoples Heritage Month by honoring the remarkable contributions of Indigenous Peoples systems engineers. These engineers bring a wealth of ancient knowledge to modern systems engineering. They apply their unique perspectives and traditional wisdom to find innovative solutions to today's challenges. For instance, they have a special way of managing resources that respects the environment, and they've developed sustainable engineering methods rooted in their cultural traditions. Their approach enriches the field of systems engineering and teaches us the enduring value of age-old wisdom.

- ***Forest Maintenance:*** Prior to the 1800's they were using burns to control wildfires; timing and location were determined by thousands of years of experience.
- ***Ancient Skills:*** Indigenous Peoples showcased advanced engineering with creations like the Phoenix Basin irrigation and Mesa Verde's cliff dwellings.
- ***Iroquois Infrastructure:*** The Iroquois Confederacy developed advanced infrastructure like longhouses, hinting at early systems engineering.
- ***STEM Growth:*** Despite underrepresentation, Indigenous Peoples participation in STEM is growing, with organizations like AISES aiding the trend.

Our Worlds: An App of Indigenous Stories Past and Present

Discover more Indigenous narratives through the immersive educational Apple app "Our Worlds". The interactive extended reality app, designed by founders Kilma Lattin and software engineer Catherine Eng, tells the stories and experiences of tribal elders. It connects the past, with the present, in geolocation. Read more about the award-winning new app here: https://ourworlds.io/

Ergonomics and Systems Thinking: Fostering Inclusivity

In systems engineering, creating inclusive designs is vital. Ergonomics, the science of enhancing human well-being and system performance, plays a key role. Combining ergonomics and systems thinking ensures systems are designed with diverse needs and abilities. This approach is crucial for People of Color (POC) and individuals with disabilities, who may face unique challenges. Inclusivity in system design, informed by ergonomics, leads to products and environments that cater to various backgrounds and physical abilities.

- ***Diverse Biometric Data Recognition:*** Recognition technologies like facial recognition have made significant strides in addressing biases related to skin tone. Researchers and engineers are working to ensure that these systems work accurately for people of all skin colors.

- ***Ergonomic Product Design:*** Many products, from furniture to vehicles, are now designed with ergonomics in mind. This inclusive approach ensures that products are comfortable and safe for many users.
- ***Assistive Devices:*** There has been continuous innovation in assistive technology. Devices like mobility aids, hearing aids, and braille displays have improved the quality of life for POC and individuals with disabilities.
- ***Inclusive User Experience (UX) Design:*** UX designers focus on creating digital interfaces and applications that are intuitive and easy to use for everyone. This approach benefits POC and individuals with disabilities.

By uniting ergonomics and systems thinking, engineers can craft a more inclusive world, celebrating diversity and ensuring that systems work for everyone. This approach underlines the importance of embracing inclusivity, especially as we commemorate Indigenous Peoples Heritage Month.

From STEM to STEAM: Integrating Art with Engineering

This National STEM/STEAM Day on November 8, let's embrace the symphony of Science, Technology, Engineering, Art, and Math. Systems engineering isn't just about logic; it thrives on creativity, too. Delve into enlightening stories of how art influences and elevates the engineering world.

Mary Golda Ross: Pioneering Aerospace and Systems Engineering

In honor of Indigenous Peoples Heritage Month, we celebrate the legacy of Mary Golda Ross, a true trailblazer in aerospace systems engineering. Born in 1908 and a proud Cherokee Nation member, Ross defied the norms of her era to pursue her passion for aerospace engineering.

After earning a mathematics degree from Northeastern State College, Ross embarked on a journey that would reshape the aerospace industry. During World War II, she joined **Lockheed Aircraft Corporation**, working on classified projects. Her mathematical genius and engineering insights proved indispensable. Ross's understanding of systems engineering principles, combined with her mathematical expertise, made her an invaluable asset to the innovative **Skunk Works** team - responsible for a number of highly classified research and advanced development programs including aircraft designs and exotic aircraft platforms.

Ross made significant contributions to spacecraft design and satellite-based communications, laying the foundation for modern aerospace systems. Her work played a pivotal role in projects such as the submarine-launched **Polaris missile program** and the NASA human spaceflight **Apollo moon missions**.

Beyond her technical achievements, Ross was a passionate advocate for STEM education, especially among Indigenous Peoples students. A SWE Fellow and honorary member of the American Indians in Science and Engineering Society (AISES), her dedication to education and diversity continues to inspire future engineers. Read more about the fascinating Mary G. Ross legacy through SWE All Together.
Mary's story exemplifies the power of determination and diversity in aerospace systems engineering. Her groundbreaking work and commitment to education resonate with the core values of systems engineering, where innovation knows no bounds.

Discover More STEAM Competitions

Do you know someone who is interested in engineering or another STEAM career?
Here are some great ways to engage your students!

- **Nov 27** is the deadline for the Jensen Hughes Fire Safety Challenge. This contest, geared to raise awareness of the importance of fire safety, is open to individuals in grades 6-12.
- **Dec 7** is an information session about the Jacobs Teen Innovation Challenge. This sustainability challenge for middle and high school teams is open **Jan 25 - April 30th**.
- **Feb 1** is the deadline for the Engineer Girl Writing Contest. It is open to both boys and girls in grades 3-12. This year's theme is **"The Secret Life of Everyday Items"**.

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