ARBiT it happens here...

## Beans Month

*Beans Month* bursts into July with a celebration of one of the world's favorite and most versatile ingredients- *beans*! This entire month is dedicated to enjoying and appreciating the various kinds and uses of beans, from snacks to main dishes. It's a time to highlight how nutritious and tasty beans can be. Beans aren't just good for your health, they're also a delight for the palate, capable of transforming into hearty meals or light accompaniments. Their high fibre content is excellent for heart health and digestion, making them a smart choice for any meal.

राष्ट्रदूत
FRIDAY
05 July 2024
A-B

#ALLIANCE

# Joint Finances

Married couples, who have joint bank accounts, not only have better relationships, but they fight less over money and feel better about how household finances are handled.

Married couples, who manage their finances together, may love each other longer, according to a new study.

Prior research suggests a correlation that couples, who merge finances, tend to be happier than those who do not. But this is the first research to show a causal relationship that married couples, who have joint bank accounts, not only have better relationships, but they fight less over money and feel better about how household finances are handled.

"When we surveyed people of varying relationship lengths, those who had merged accounts reported higher levels of community within their marriage compared to people with separate accounts, or even those who partially merged their finances," says Jenny Olson, assistant professor of Marketing at the Kelley School of Business at Indiana University.

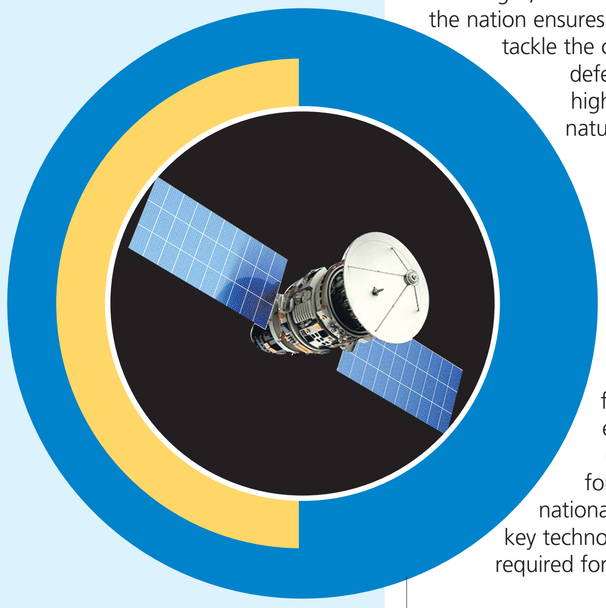
"This is the best evidence that we have to date for a question that shapes couples' futures, and the fact that we observe these meaningful shifts over two years, I think it's a pretty powerful testament to the benefits of merging." Olson and her co-authors recruited 230 couples, who were either engaged or newly married at the time, and followed them over two years, as they began their married lives together. Everyone began the study with separate accounts and consented to potentially changing their financial arrangements. This was the first marriage for everyone involved in the study.

The researchers then randomly assigned some couples to keep their separate bank accounts, and told others to open a joint bank account, instead. A third group was allowed to make the decision on their own.

Couples, who were told to open joint bank accounts, reported substantially higher relationship quality two years later than those who maintained separate accounts. Olson says, "Adding that merging promotes greater financial goal alignment and transparency, and a communal understanding of marriage."

"A communal relationship is one where partners respond to each other's needs because there's a need. I want to help you because you need it. I'm not keeping track," she says. "There's a 'we' perspective, which we theorized, would be related to a joint bank account."

"Couples with separate accounts viewed financial decision-making as more of an exchange," Olson says.



For any country to prepare for the challenges, it is essential that military of the nation ensures industry readiness to tackle the challenges of modern defence and intelligence, highlighting the dynamic nature of operations. The Satcom Industries Association of India during DEFSAT 24 emphasised that "Informationized warfare harnesses the synergy of advanced spacecraft technologies, data fusion, AI integration, edge computing, and quantum computing, forming the bedrock of national security." There are key technological developments required for space based ISR and meshed intelligence.

# ARE WE PREPARED FOR PRECISION AND DEEP BATTLES!

## Space Based ISR

For any country to prepare for the challenges, it is essential that military of the nation ensures industry readiness to tackle the challenges of modern defence and intelligence, highlighting the dynamic nature of operations. The Satcom Industries Association of India during DEFSAT 24 emphasised that "Informationized warfare harnesses the synergy of advanced spacecraft technologies, data fusion, AI integration, edge computing, and quantum computing, forming the bedrock of national security." The key technological developments required for space based ISR and meshed intelligence would be to-

### Develop Multi-sensor Payloads

**Focus** on creating satellites that can house multiple sensors to provide comprehensive data regardless of environmental conditions while having universal interfaces, enabling modular plug-and-play integration across defence platforms and assets.

### Focus on User-Driven Solutions

**Design** and develop intelligence systems, based on the operational requirements and feedback from end-users in the defence sector, ensuring that technological advancements align with practical military needs.

### Enhance Data Fusion Techniques and Leverage AI

**Invest** in technologies that allow the integration of data from various sensors, improving the accuracy and utility of the information gathered. Utilise artificial intelligence to automate the analysis of vast amounts of satellite data, turning it into actionable intelligence more efficiently.

### Implement Edge Computing

**Adopt** edge computing on satellites to process data onboard, significantly reducing the time taken to deliver critical information to decision-makers. Implement end-to-end encryption capabilities to harden satellites and communications against cyber threats.

### Support Long-Term R&D

**Allocate** funding for research and development in emerging technologies like quantum computing, which can offer unprecedented capabilities in data security and processing.

### Civilian Application and Strategic Implication

**Civilian** satellite operations have unintended strategic implications, and there's potential for utilising civilian data for strategic military purposes.



### Adopt a Whole-of-Nation Approach

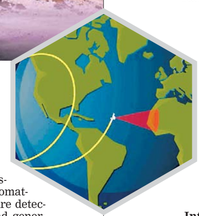
**Recognise** the necessity of integrating efforts across the nation and with international partners to enhance space diplomacy and cooperation.

## Space and Military Operations

#WARGAMES

There is a critical role of space technologies in enhancing *precision and depth* in military operations, exploring the challenges and requirements for integrating space capabilities into defence strategies. The scenarios were played during the Industrial Wargame as part of DEFSAT 24.

The exercise highlighted the importance of integrating space technologies such as satellite reconnaissance, GPS-guided munitions, and satellite communications to revolutionise battlefield operations. The vast expanse of areas like the Indian Ocean Region poses significant challenges for maritime surveillance, necessitating the deployment of advanced Earth observation satellites and ELINT (Electronic Intelligence) satellites for wide-area maritime surveillance. The need for prioritizing investments in space capabilities, including military Earth observation, MILSATCOM (Military Satellite Communications), and Space Situational Awareness (SSA), was emphasised to fill capability gaps compared to global standards. The application of AI and advanced analytics in processing and analysing satellite data for actionable intelligence was discussed. This includes automating data analysis for feature detection, change detection, and generating insights for military decision-makers. Concerns regarding data security in open-source models and the potential for tampering were addressed, underscoring the need for safeguarding critical data while promoting collaborative research and development. "Space is considered the new frontier of warfare, with adversaries operating beyond conventional means." The deep and precision wars need investing in R&D and Key manufacturing capability. The following issues are pertinent,





### Enhance Real-Time Surveillance

**Develop** capabilities for near real-time, all-weather situational awareness through advanced Earth observation satellites.

### Invest in MILSATCOM

**Prioritize** investments in defence specific SATCOM for flexible, low-latency communications, incorporating software-defined elements for adaptability.

### Advance Space Situational Awareness

**Build** SSA capabilities to maintain an enriched, real-time catalog of space objects, ensuring space asset protection and offensive capabilities.

### Leverage AI for Data Analysis

**Integrate** AI and machine learning for automated analysis of satellite data, enabling proactive intelligence gathering and decision support.

### Focus on Critical Data Sets

**Identify** and prioritise critical data sets required for military operations, including high-resolution Earth observation and ELINT data, to guide investment and development efforts.

### Adopt Mosaic Warfare Strategies

**Transition** from traditional kill chains to a more resilient and adaptive kill web framework, to enhance operational flexibility and effectiveness.

### Enhance Laser Communication

**Invest** in laser technology for secure, high-speed communication essential for network-centric operations, particularly for smaller satellites.

### Leverage AI and ML

**Integrate** artificial intelligence and machine learning for improved decision support, predictive analytics, and optimisation of sensor and fighting system deployment.

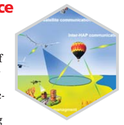


## Develop Indigenous Capabilities

Encourage the development of indigenous space technologies and capabilities to reduce dependency on foreign data sources and enhance national security. In a space based high tempo operations, it is critical to managing space control and information through the lens of Mosaic Command and Control (C2) systems, underpinned by robust ground infrastructure. It emphasised the transformative potential of Mosaic warfare, which shifts from traditional linear kill chains to a dynamic and integrated 'kill web' approach. This strategy aims to aggregate diverse sensors, systems, and data sources to outmanoeuvre adversaries by leveraging the redundancy and resilience provided by space assets. Central to the discussion was the role of advanced technologies such as AI and ML in enhancing decision support systems, enabling real-time data analysis, predictive intelligence and refined decision-making processes. It was highlighted in DEFSAT 24 about the significance of secure and reliable communication through laser technology, offering high-speed data transfer capabilities, critical for the seamless execution of Mosaic C2 operations. It is important to analyse the industry challenges, particularly the need for regulatory exemptions for satellite equipment testing, to foster innovation and growth within the sector. By integrating optical links, AI, ML, and efficient ground control systems, the panel underscored the collaborative effort required between ground and space infrastructure (deploy-on-demand satellites), to develop a comprehensive network-centric warfare capability. The following is significant.

### Develop Resilient Space and Ground Infrastructure

**Build** a robust constellation of satellites, including deploy-on-demand and software-defined satellites, for enhanced connectivity, data relay and flexible space support while upgrading ground infrastructure.



### Modern Warfare Concepts and Techniques

**Explore** the potential of both, infantry and signal bots, for strategic purposes, emphasising the importance of modeling behaviours and utilising specific knowledge domains. There is a need for careful design, control, and programming of war-fighting machines to ensure effective utilisation.

### Embrace Decentralised Decision-Making

**Empower** tactical commanders with decentralised control for faster and more effective decision-making in dynamic operational contexts.

### Integration

**Foster** integration systems between ground and space infrastructure, incorporate advanced technologies like spatial multiplexing, transmit beam forming, etc. to develop an effective kill web and network-centric warfare capabilities.

### Conclusion

The enhanced range and lethality of missiles, aerial platforms and delivery system shall be of no use unless there is a persistent and precision guidance and monitoring of deep battle spaces. It is imperative that ammunition and delivery systems are smart and space controlled to achieve tangible success in the battlefield. It is therefore imperative that due attention is accorded to the technologies discussed above. Such strategic technologies would also contribute towards achieving strategic and technological deterrence.

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*PVSM, AVSM, VSM (Retd)*

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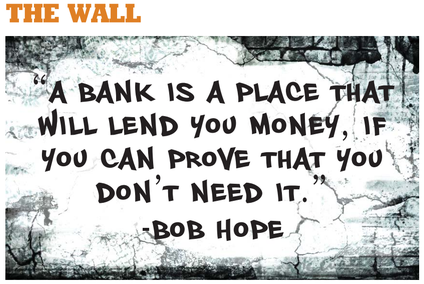
The world is at the brink of war with many countries like Russia, Ukraine, Israel and Palestinian Hamas, directly engaged in a military confrontation while other countries like Iran, Yemen, Taiwan, China, North Korea, Pakistan, and Afghanistan remain in a fragile and warlike situation, that could flash anytime into a full-blown conflict, US, Russia and China are at technological warpath where Military Industrial complex is mass producing systems and weapons that would enable deep and precision strikes.

The strategic technologies have had a revolutionary impact on the modern battlefield. As the range of artillery guns, missiles and delivery platforms have enhanced, there is a greater need to ensure precise targeting. This would largely be enabled by space assets of the country itself or depending on the military groupings and alliances, such space support can be enabled from outside, even by private sector. It has been seen how space control, communication and targeting has been facilitated by SpaceX of Elon Musk.

Advanced integration would be necessary for obtaining meshed intelligence, focusing on multi-sensor payloads and analytical platforms. There is a certain role of evolving landscape of military remote sensing, highlighting the significance of combining Synthetic Aperture Radar (SAR) and Electro-Optical (EO) sensors on single platforms. Such integration calls for the role of data fusion, AI integration, and edge computing in enhancing intelligence gathered from space assets. Collaborative efforts between the defence sector, academia, and the private sector are a keystone to address complex military needs effectively.

Additionally, the key technologies such as advanced missile and gun systems would be using smart ammunition for smart guidance or autonomous targeting. These would need spacecraft in near-space, aerospace and long-range vectors to have on board data fusion, AI integration, quantum computing, and IoT sensor networks. These technologies enable and optimise the capabilities like communications, navigation, ISR, situation awareness, targeting, and early warning. This kind of warfare needs intimate support of the industrial ecosystem, as also terrestrial and non-terrestrial network, that is achievable in utilising advanced technologies like satellite miniaturization, AI and quantum computing for military applications, emphasising the importance of capacity building in the satellite data sector.

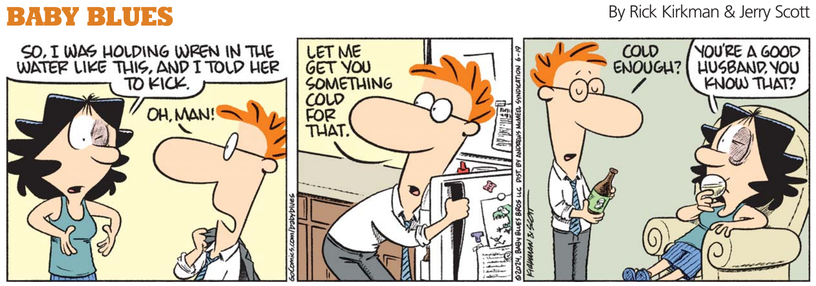
## THE WALL





## BABY BLUES

By Rick Kirkman & Jerry Scott





## ZITS

By Jerry Scott & Jim Borgman