UNIVERSITI TEKNOLOGI MARA

EXTENDED ABSTRACT

DESIGN INNOVATION ACADEMIC SHOW 2025

InVICCAID 2025
1ST INTERNATIONAL VIRTUAL COMPETITION OF CREATIVE ARTS & INNOVATIVE DESIGN IN TEACHING & LEARNING

MONDARIKA

NIAT
NORTHERN INNOVATION ACADEMIC TOUR

Organized by

Faculty of Art & Design
#perubahanluarbiasa
#ADpilihanpertama

UNIVERSITI TEKNOLOGI MARA
Fakulti Seni Lukis & Seni Reka
Cawangan Kedah

UiTM di hatiku

Collaboration with

PUSAT SAINS NEGARA WILAYAH UTARA

KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

EXTENDED ABSTRACT

'Design Innovation Academic Show 2025

DIAS 2025 (Design Innovation Academic Show) is all about "Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st Century Education." This vibrant program shines a spotlight on how creativity and innovation are reshaping modern education.

It consists of three key components. First up is the Mindareka Design Show, an exhibition that showcases students' final year projects and creative designs, giving them a chance to connect with industry professionals and the wider community. Next, we have the Northern Innovation Academic Tour (NIAT), which takes participants on an academic adventure to select institutions and innovation centers in the northern region, aimed at promoting knowledge sharing and building strong academic and professional networks.

Finally, there's the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID), a global competition that recognizes outstanding practices in teaching and learning by blending art, technology, and innovative design. But DIAS 2025 is more than just a talent showcase; it's a powerful platform for empowering both students and educators, while also strengthening collaborations between universities, creative industries, and global communities. With its inclusive and interdisciplinary approach, this initiative strives to spark relevant, competitive, and impactful ideas and innovations that truly benefit society and push the future of education forward.

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Prof. Dr. Roshima Haji Said
Acting Rector
UiTM Kedah Branch

Rector's Message

I am delighted to extend my heartfelt congratulations to the College of Creative Arts, UiTM Kedah Branch, for bringing MINDAREKA 2024 - Unleashing Your Visual Creativity to fruition. The triumphs of past MINDAREKA editions undoubtedly fueled the organization of this year's event, making MINDAREKA 2024 a reality.

MINDAREKA 2024 - Unleashing Your Visual Creativity stands as a testament to the dedication of students at the College of Creative Arts, UiTM Kedah Branch, providing them with a platform to showcase their final art projects. Beyond serving as a space for the exploration of fresh, innovative, and entrepreneurial concepts, this exhibition is poised to connect aspiring talents with potential clients and employers.

I extend my sincere gratitude to all participants whose enthusiasm and support have contributed to the success of MINDAREKA 2024 - Unleashing Your Visual Creativity. Their unwavering belief and commitment have truly brought this event to life, marking it as a resounding triumph!

Head of Faculty Message

Mohamat Najib Mat Noor
Head of Faculty
Faculty of Arts & Design
UiTM Kedah Branch

It is an honour to introduce DIAS 2025 – Design Innovation Academic Show, held under the theme "Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st-Century Education." This significant event reflects the faculty's ongoing commitment to fostering a culture of innovation, critical thinking, and creative exploration among our students and academic community. As we navigate the complexities of the 21st century, it becomes increasingly clear that education must go beyond traditional boundaries to embrace multidisciplinary approaches that are both relevant and future-forward.

The three core components of DIAS 2025, Mindareka Design Show, Northern Innovation Academic Tour (NIAT), and the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID)which is serve as vital platforms to highlight the convergence of design, technology, and pedagogy. These initiatives not only empower our students to showcase their talents and ideas, but also create opportunities for engagement with industry leaders, academic peers, and global collaborators. The Mindareka Design Show celebrates student creativity and innovation through compelling final year projects. NIAT fosters knowledge sharing and institutional partnerships through academic visits and exchanges, while InViCCAID offers international recognition for excellence in integrating art and design into teaching and learning.

I would like to express my deepest appreciation to the organising committee, faculty members, students, and strategic partners who have worked tirelessly to bring this programme to life. Your dedication and collaborative spirit have made DIAS 2025 a reality and a reflection of our shared vision for transformative education. It is my hope that this platform will continue to inspire meaningful dialogue, cultivate groundbreaking ideas, and spark a new wave of innovation that enriches both education and society.

Industrial Design (Diploma)

WOOD WAGON: COMPACT TRANSFER SOLUTION FOR WOOD MATERIALS, BOOSTING SAFETY AND EFFICIENCY

Wan Yusuf Al-Harith Bin Wan Ismail@Faizul, Azmir Mamat Nawi

Industrial Design Department,
Faculty Of Art and Design,
Universiti Teknologi Mara (UiTM)
wanyusufwanismail@gmail.com

ABSTRACT

The **Wood Wagon Space-Saving Trolley for Efficient Wood Transfer** is a functional and efficiently designed trolley to improve wood handling in factory. This trolley features a sliding system that allows it to be nested from right to left, locking securely in place to minimize storage space when not in use. Designed with functionality and mobility in mind, the handle is fully foldable, allowing it to be tucked neatly into the frame. The wood platform can also be lowered to further reduce the trolley's height and footprint during storage. At the rear, the wood support is slightly tilted upward a purposeful design to keep wooden materials level and secure when moving uphill or on ramps, preventing them from sliding backward. The comfortable grip handle, combined with caster wheels that rotate in sync with the handle direction, ensures smooth and controlled movement, even in tight or inclined spaces. Built with durable materials and a compact design, the trolley improves workflow efficiency, reduces clutter, and enhances safety during wood transportation. This project addresses key challenges in wood transfer operations, such as space constraints, manual handling strain, and safe mobility making it an ideal addition to any woodworking or manufacturing workspace.

Keywords: Space-Saving Trolley, Sliding Mechanism, Ramp-Friendly Design, Industrial Ergonomics, Compact Storage.

INTRODUCTION

The MADAD Clock Factory is a fast-paced production environment where different clock components like faces, mechanisms, and wooden back panels are assembled. One of the recurring challenges on the factory floor is the efficient handling and storage of clock back panels, especially during peak production times. These panels are often bulky, and without a proper system, they can clutter the workspace, slow down movement, and increase the risk of damage or accidents.

To solve this issue, the Wood Wagon Space-Saving Trolley was specifically developed for the transport and storage of clock back panels. Rather than redesigning the entire workspace, this focused solution provides an efficient way to move, organize, and temporarily store panels with ease.

The trolley is lightweight, easy to maneuver, and designed with several space-saving features: a foldable handle, a lowerable wood base, and a side-sliding mechanism that allows it to nest or lock into place for compact storage. The rear platform is slightly tilted upward, ensuring the panels remain straight and stable when moving up ramps or inclines within the factory.

With its ergonomic grip, smooth-rolling wheels that follow handle direction, and compact form, the Wood Wagon trolley improves workflow, keeps the floor organized, and makes handling clock back panels more efficient and safer for workers.

MATERIAL AND METHODS

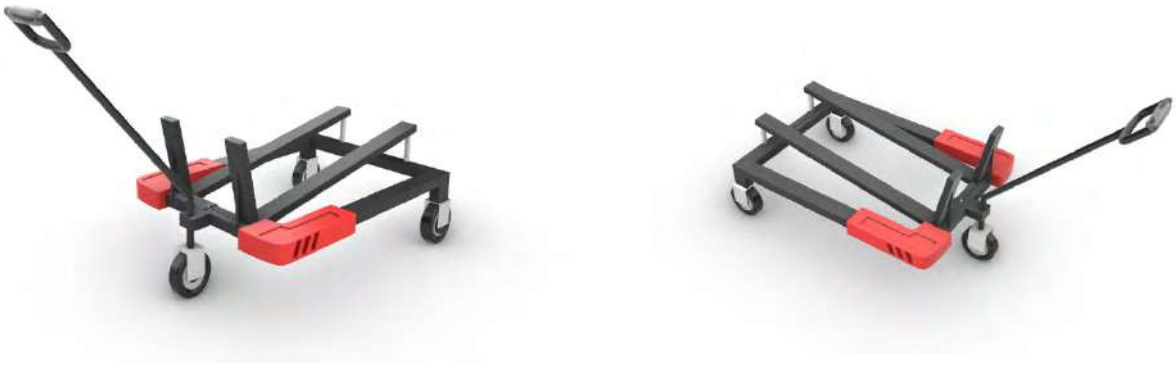

Figure 1 Wood Wagon final product

The Wood Wagon is constructed using lightweight rectangular hollow steel tubing, selected for its balance of strength, portability, and durability ideal for frequent handling in factory environments. The rectangular profile offers stability and load-bearing support, while its light weight ensures the trolley can be easily maneuvered by workers of all skill levels.

To enable secure positioning and compact storage, the steel frame is precision-drilled at key points, allowing a locking mechanism to fix the trolley in place once it's slid into storage or adjusted for use. The handle is designed to fold inward and lock securely, minimizing the trolley's footprint when not in operation.

For smooth and safe movement, the trolley is equipped with durable, industrial-grade tyres that are engineered to follow the handle's direction, enhancing steering control and maneuverability especially when navigating narrow paths or ramps. At the rear, a tilted wood support platform ensures that clock back panels stay upright and balanced when moving uphill, reducing the risk of them falling backward.

Every component and mechanism were chosen with ergonomics, space efficiency, and safety in mind, making the Wood Wagon trolley a highly functional tool for transporting clock back panels within the MADAD Clock Factory.

The development and testing of Wood Wagon Space-Saving Trolley revealed major improvements in efficiency, safety, and space management compared to conventional manual wood or panel handling methods. Through user observations and trial runs with factory workers, several key insights emerged.

The foldable design including the collapsible handle, lowerable base, and right-to-left sliding mechanism allowed for compact storage, which is especially valuable in a busy factory setting where floor space is limited. Workers found the trolley easy to fold and park, reducing visual clutter and making storage more efficient.

The rear-tilted wooden platform proved especially helpful when transporting clock back panels uphill, keeping materials upright and stable while in motion. This small but important design detail lowered the risk of panels sliding backward or getting damaged, especially when moving across ramps or uneven surfaces.

The lightweight rectangular hollow steel frame provided excellent strength without adding unnecessary weight, making it easy to maneuver even when fully loaded. The drilled locking points gave users confidence that the structure would stay in place during storage or use. Combined with the smooth-turning wheels that follow the handle direction, users reported that steering and control felt natural and safe.

Feedback from factory staff confirmed that the trolley was user-friendly, ergonomic, and well-suited for their daily needs. The design not only simplified the process of moving and storing clock back panels but also aligned with key human-centered design principles, focusing on ease of use, reduced strain, and better workflow.

In conclusion, testing confirmed that the Wood Wagon Trolley meets its design goals by offering a practical, compact, and safe solution tailored to the specific challenges of clock component handling in the MADAD Clock Factory.

To wrap things up, the Wood Wagon Trolley effectively solves common challenges in traditional wood handling within factory environments through its compact, ergonomic, and user-friendly design. Constructed from lightweight rectangular hollow steel and equipped with a foldable handle, lowerable base, and side-sliding lock mechanism, the trolley offers a practical solution that balances durability, efficiency, and space-saving functionality.

The rear-tilted wooden platform is a key feature, helping to keep wood pieces upright and stable when moving up ramps or inclined surfaces. Workers found the trolley safe, smooth to maneuver, and easy to store, all of which support better workflow and reduce physical strain especially in busy industrial settings.

Suggestions for future improvements:

- Introduce a wheel-locking system for added stability during loading and unloading.
- Explore the use of lighter but strong materials to further improve portability.
- Offer modular base configurations for handling different wood sizes or quantities.
- Provide customizable frame colors or tags for better organization across factory zones.

Overall, the Wood Wagon Trolley demonstrates strong potential for wider use in wood transportation tasks across various industries, offering a well-designed, compact solution that merges functionality with human-centered innovation.

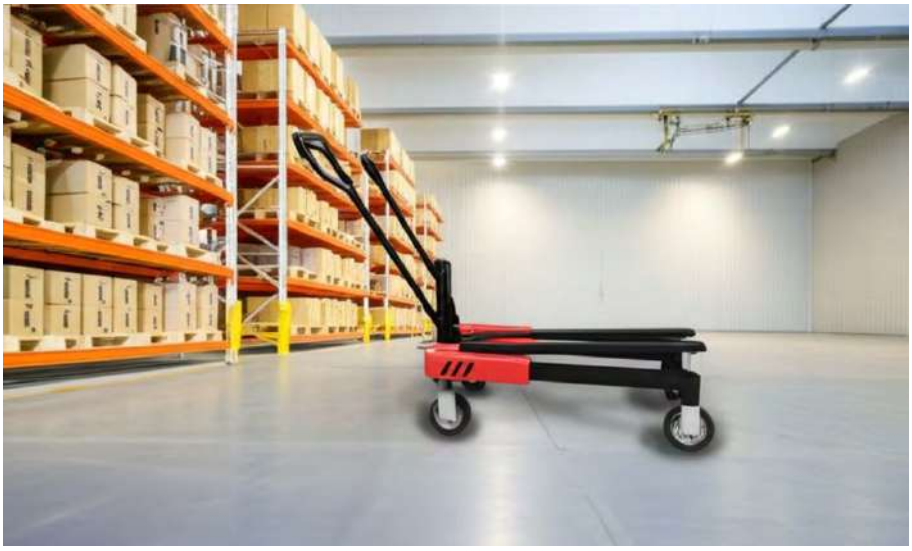

Figure 2 Wood Wagon in environment

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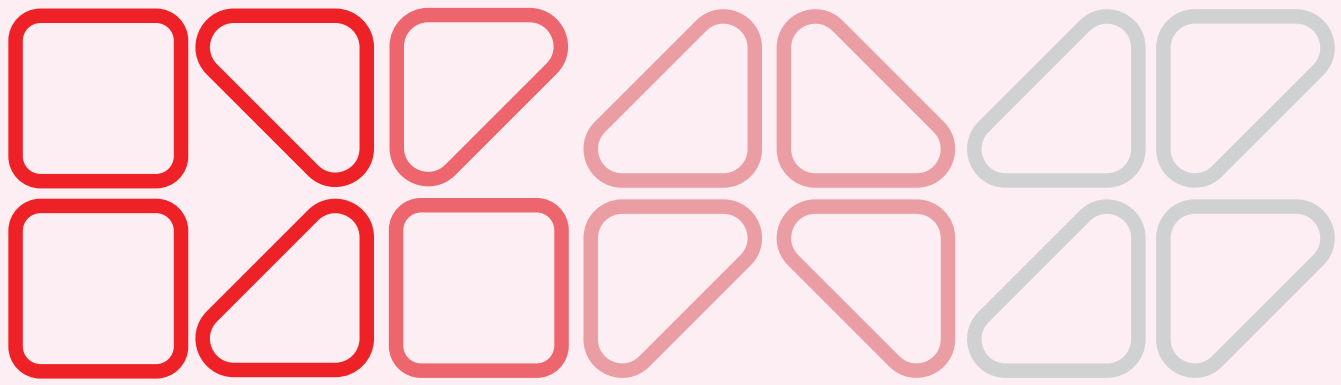

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