



SEPTEMBER 2024

Healthcare Technology Summit



Agenda

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02 **Introducing Partner – Siriraj Hospital**
Understanding Siriraj Hospital's requirements

03 **Case Studies**
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SEPTEMBER 2024

Introducing DB Results

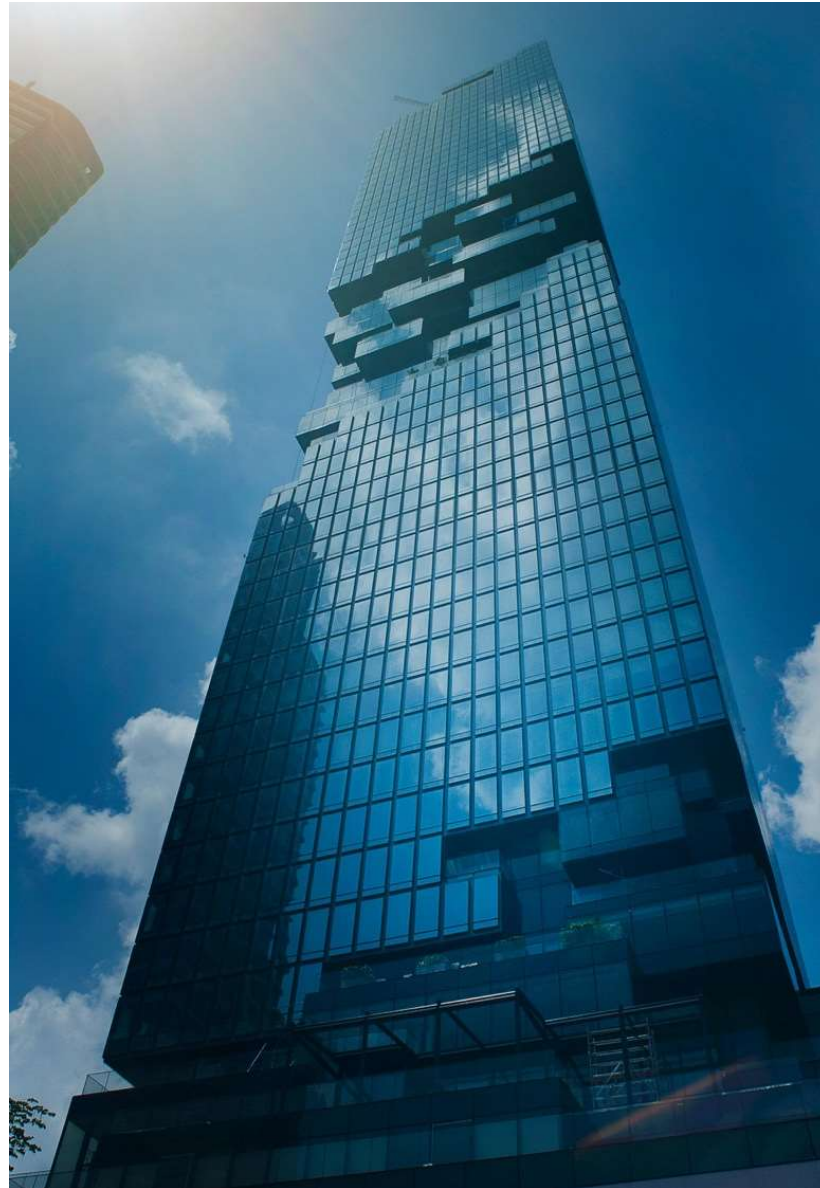


Who we are. DB Results

Established in 2004, we are a privately owned Australian company with global reach and experience, employing 500 specialists.

DB Results is a B Corp certified digital business consulting and technology company. We specialise in helping our customers to transform, from strategy to reality.

We take pride in our effective collaboration with clients and partners, consistently delivering exceptional results that surpass expectations, while enhancing efficiency and effectiveness.



Energy & Utilities



Financial Services



Health



Public Sector &
Essential Services

What we offer

DB Results provides deep specialist expertise across various industries. We lead with innovation, integrity and drive to deliver the best outcomes for our clients that address real-world challenges.

We have strong experience in:

- Digital transformation – modernising business processes, enhancing customer experiences and driving innovation.
- Regulatory and compliance – assisting organisations to meet complex and evolving regulatory requirements.
- Program delivery and management – managing and delivery complex programs and ensuring successful outcomes.
- Digital solutions – developing innovative digital solutions to address specific business needs and enhance user engagement.

DB Results combines industry expertise with cutting-edge technology to deliver comprehensive solutions that support organisational growth and efficiency.



Enterprise project delivery

Ensuring on-time, on-budget delivery



Mergers/Demergers and Acquisitions

Simplifying corporate systems and processes



Project rescue

Successfully correcting wayward projects



Complex systems development

Specialists in solving complex problems



Enhancing business agility

Allowing enterprises to reach for their next level of performance



Facilitating good business practice

Incorporating governance, risk and compliance into all facets of operations.

Health

The healthcare operating model and technology are undergoing a major transformation. Industry reforms, an ageing population and the need for more accessible services are leading the shift to patient-centric healthcare and digital, personal experiences.

DB Results is a purpose-driven organisation, and we have a rich history of product development and digital delivery of large, complex projects within the healthcare sector.



Innovative health solutions

Integrating and modernising health systems and building digital health platforms to support and streamline patient management and engagement.



Digital transformations for hospitals and aged care

Governance and full-scale transformation projects helping organisations benefit from optimal use of their resources and funding.



Patient-centric healthcare and accessibility

Placing the patient at the centre of the healthcare experience, with a focus on digital accessibility ensuring access to digital health tools and information.



Strategic planning

Current state assessment to actionable goals designed to enhance healthcare systems and optimise resources.

Introducing OutSystems



Introducing OutSystems

OutSystems is a leader in the Enterprise Low Code Application Development Platform (LCAP) arena.

OutSystems has revolutionised the way companies manage their digital transformation and provides a technology that is #1 in its market segment. The low-code platform empowers business analysts and IT professionals to collaborate seamlessly and bring innovative ideas to life.

OutSystems is renowned for its ability to:

- Provide powerful development at speed
- Enhanced agility to reflect changes in business needs
- Robust security and data protection out-of-the-box
- Unprecedented scalability to allow your enterprise to grow



As of August 2023

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Enterprise Lowcode Use Cases

Utilising a lowcode platform can propel an organisation forward in delivering mission-critical software. Whether it be enhancing the citizen experience, modernising outdated legacy systems or developing powerful applications to streamline operations and boost productivity – lowcode is the ideal tool to achieve it quickly and effectively.



Deliver at speed, with less resources

Make development faster
and more cost effective

Be agile, be flexible

Do more with what you
have



Modernise legacy technology

Extend systems to unlock
new value

Turn legacy apps into
modern powerhouses

Rebuild core systems so
they do what you need
them to do



Delight your users. Optimise CX

Get great engagement
with exceptional UX

Build for any and every
device (inc. mobile)

Craft experiences that are
as unique as your business



Automate for better efficiency

Digitalise paper processes

Automate complex
workflows

Save money by saving time

Security Compliance

Amid digital transformation and rising cyber threats, OutSystems prioritises enterprise security. The platform safeguards the lowcode environment and customer applications, protecting sensitive data without requiring deep security expertise.

OutSystems' commitment to rigorous security covers every aspect of the platform. As members of the Cloud Security Alliance (CSA) and CIS SecureSuite, they utilise top-tier tools and protections to ensure the platform remains secure, adaptable, and compliant, empowering organisations to thrive securely in the digital landscape.



✓ CSA STAR



✓ GDPR



✓ HIPAA



✓ PCI DSS



✓ TISAX



✓ SOC 2



✓ ISAO 22301



✓ ISO 9001



✓ ISO 27001



✓ ISO 27001
(SoA)



✓ ISO 27017



✓ ISO 27018

Siriraj Hospital

Our Application partner

Siriraj Hospital, as part of the Mahidol University's Faculty of Medicine is a premier health care delivery facility in Thailand. The hospital is a world-class medical & research center.

We have been working in partnership with Siriraj Hospital since 2019. In February 2020 a MOU was signed between the two organisations. Together we have developed a range of healthcare applications.

In addition we have mentored Siriraj developers so that they now develop in OutSystems independently.

Today we will showcase two applications that have been developed on the OutSystems LCAP solution, and discuss the direct benefits that they have contributed to Siriraj Hospital's patient outcomes and clinical staff effectiveness.



**Mahidol University
Faculty of Medicine
Siriraj Hospital**

"Siriraj always valued the quality of medical services, medical education, research conduction, and a continuous improvement as our top priority!"

Siriraj has been certified by many international standards such as Hospital Accreditation, JCI, ISO, WFME, AUNQA, Disease-specific certification and so on. We are the role model in quality assurance that motivated other healthcare sectors to moving forward!

I intend to leverage Siriraj to become an international healthcare model through knowledge integration and innovations that will benefit not only the Thai people but at the global level!"

**Apichat Asavamongkolkul, M.D.
Professor and Dean**

Case Studies

Siriraj Pathology Application



THE CHALLENGE

Reduce or remove manual processes. Manage the 600,000 specimens tested per year. Provide adequate and equitable exposure of Residents training in the pathology laboratory. Improve schedule management for specialist pathologists to ensure efficient and effective training coverage.



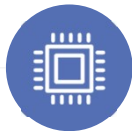
CONSTRAINTS

Pathology tests requests have varying degrees of urgency and timeliness. Availability of specialists to assist with training. Frequency of specific pathology tests are unpredictable. Not all pathology tests require the same time to perform – staggered scheduling is necessary.



CLINICAL SETTING

Scheduling needs to be aware of the operations of the pathology lab. Ensuring good, even allocation of specialists/doctors/test types. Need to minimise any disruption to the operation of the laboratory.



ARCHITECTURE

Must be able to integrate and interoperate with the existing laboratory systems. Must be smooth and easy to use. Can't add administrative burden to the pathologists, doctors and other clinical staff.



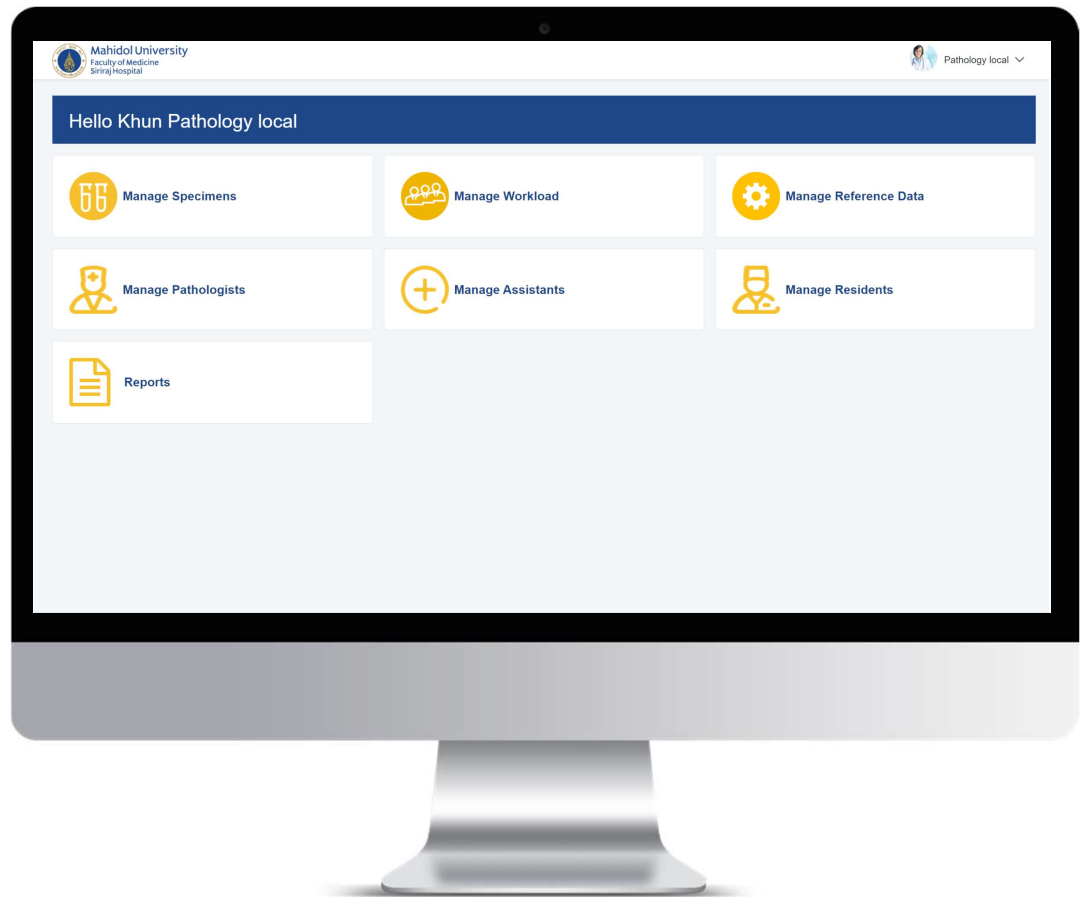
DEVELOPMENT

Required human centred design principles to ensure it was easy to use. Minimal training and oversight for operation were essential.

Pathology Dashboard

Simple processes for application Administrator to:

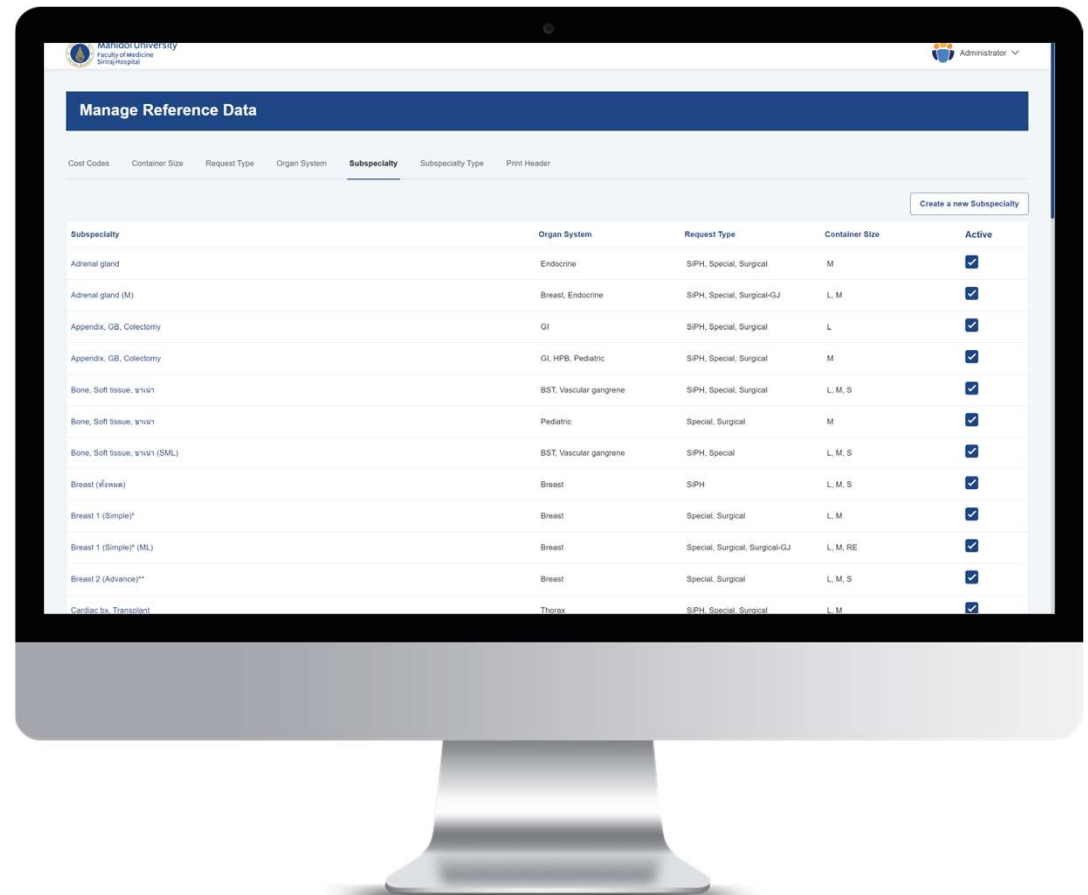
- Recording samples and link to patient.
- Defining the sample's pathology test profile to assist with workloads.
- Registering and managing the profiles of Pathologists, Assistants and Residents.
- Manage the reference data sets.
- Creating and running reports and compliance checks.



Configurable data sets

Data set configuration describing:

- Pathologist expertise and specialties/sub-specialties.
- Staff availability across calendar to facilitate allocations.
- Pathology test descriptions, requirements, complexity, speciality/sub-speciality, request types, organ systems, cost codes and accounting links.



| Subspecialty | Organ System | Request Type | Container Size | Active |
|----------------------------------|------------------------|--------------------------------|----------------|-------------------------------------|
| Adrenal gland | Endocrine | SPH, Special, Surgical | M | <input checked="" type="checkbox"/> |
| Adrenal gland (M) | Breast, Endocrine | SPH, Special, Surgical-GJ | L, M | <input checked="" type="checkbox"/> |
| Appendix, GB, Colectomy | GI | SPH, Special, Surgical | L | <input checked="" type="checkbox"/> |
| Appendix, GB, Colectomy | GI, HPB, Pediatric | SPH, Special, Surgical | M | <input checked="" type="checkbox"/> |
| Bone, Soft tissue, ฮอร์โมน | BST, Vascular gangrene | SPH, Special, Surgical | L, M, S | <input checked="" type="checkbox"/> |
| Bone, Soft tissue, ฮอร์โมน | Pediatric | Special, Surgical | M | <input checked="" type="checkbox"/> |
| Bone, Soft tissue, ฮอร์โมน (SML) | BST, Vascular gangrene | SPH, Special | L, M, S | <input checked="" type="checkbox"/> |
| Breast (ไขมัน) | Breast | SPH | L, M, S | <input checked="" type="checkbox"/> |
| Breast 1 (Simple)* | Breast | Special, Surgical | L, M | <input checked="" type="checkbox"/> |
| Breast 1 (Simple)* (ML) | Breast | Special, Surgical, Surgical-GJ | L, M, RE | <input checked="" type="checkbox"/> |
| Breast 2 (Advance)** | Breast | Special, Surgical | L, M, S | <input checked="" type="checkbox"/> |
| Cervix to Transplant | Throat | SPH, Special, Surgical | L, M | <input checked="" type="checkbox"/> |

Workload allocation and management

- Semi-automated workflow for scheduling and allocating staff. Suggestions based on existing workload, Resident exposure to test type, staff availability, frequency of pathologist pairing.
- Selected integration with hospital admin and laboratory systems to alleviate double data entry.
- Significant reduction or elimination of paper-based data recording.
- Greatly enhanced monitoring and reporting.
- Provides pathology staff with workload visibility in real time.

Manage Workload

Pathologists Assistant Resident

Request Type: GH - SPH Week Start: September 09, 2024

Copy From Previous Week Export to Excel File

| Subspecialty | Monday 09 Sep 2024 | Tuesday 10 Sep 2024 | Wednesday 11 Sep 2024 | Thursday 12 Sep 2024 | Friday 13 Sep 2024 | Saturday 14 Sep 2024 | Sunday 15 Sep 2024 |
|-------------------------------------|-----------------------|------------------------|--------------------------|-------------------------|-----------------------|-------------------------|-----------------------|
| Appendix GB: Collecting (GB) | Wisan Y. | Wisan Y. | Wisan Y. | Wisan Y. | Wisan Y. | Wisan Y. | Wisan Y. |
| Bone Soft tissue, iron (Pulmon) | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. |
| Bone Soft tissue, iron (Pulm) (BPT) | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. | Amaya P. |
| Appendix GB: Collecting (GB) | Phasa S. | Phasa S. | Mangal U. | Mangal U. | Mangal U. | Phasa S. | Phasa S. |
| Bone (Bone) (Bone) | Nathavath L. | Nathavath L. | Nathavath L. | Wise W. | Wise W. | Nathavath L. | Nathavath L. |

+ Add Record

Pathology scheduling application benefits

The Pathology application has shown measurable improvements in Resident training outcomes, resource scheduling, allocation & utilisation, and enhancements in monitoring and reporting.

Specimen Management

Reduction in time taken to register specimens.

Efficiency gains with improved data quality.

Self-management of cost codes and reference data sets.

Enhanced reporting.

Scheduling and workload allocation

Improved workload balance.

More even exposure of Residents to pathology test training.

Vastly reduced paper-based management requirements.

Improved Resident outcomes

Higher satisfaction of Resident training based on automated scheduling.

Improved work experience of lab staff.

Enhanced Recovery After Surgery (ERAS) Application



THE CHALLENGE

Reduce the manual and paper-based surgery management procedures. Enhance the recovery after surgery procedures to improve patient outcomes, better manage on-ward resources, reduce adverse clinic events, improve compliance and reporting, and facilitate the best patient wellness.



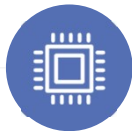
CONSTRAINTS

Siriraj governance and policy requires hand-written case notes, so some additional changes are required outside of the technology. System integration is limited but improving with new releases..



CLINICAL SETTING

Solution must be able to accommodate individual patient, clinical and on-ward circumstances. Must be able to facilitate continuous improvements as developed by the clinical staff. Must be minimally disruptive to the operation of the wards and care delivery.



ARCHITECTURE

Must be able to integrate and interoperate with the existing EMR and on-ward systems. Must be smooth and easy to use. Can't add administrative burden to the doctors, nurses and on-ward staff.



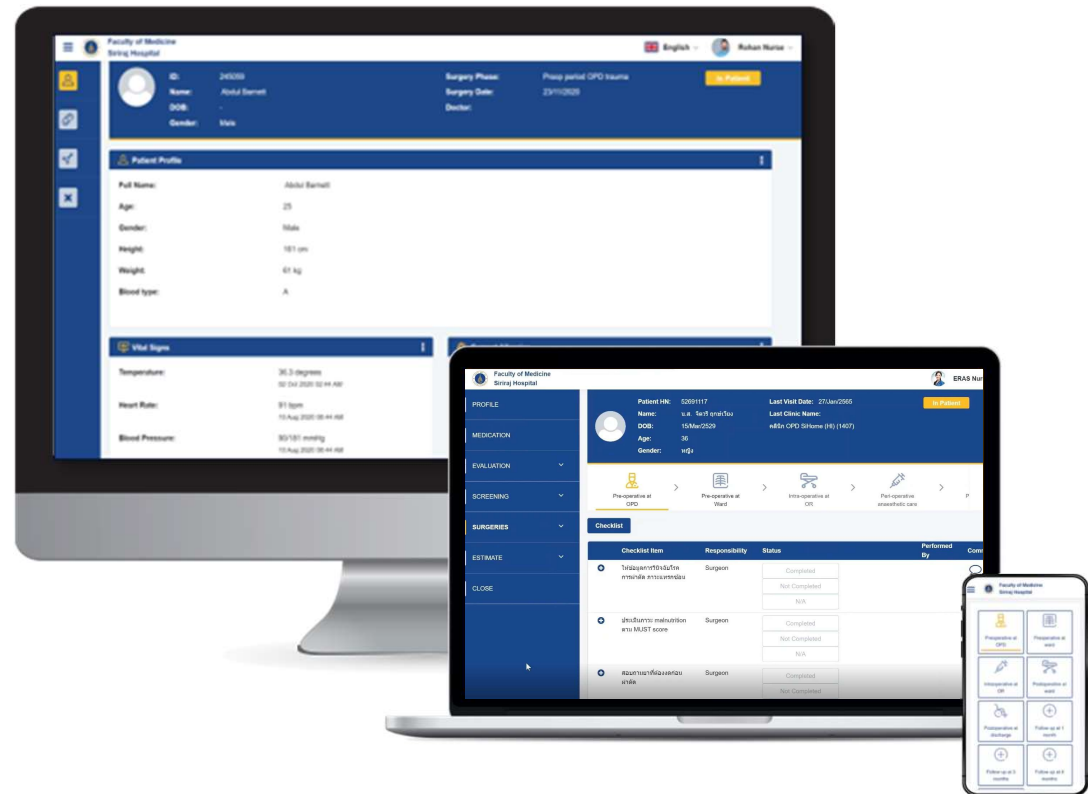
DEVELOPMENT

Required human centred design principles to ensure it was easy to use. Minimal training and oversight for operation were essential.

Adaptive web application

The ERAS solution operates on all form factors – desktop browser, tablet and mobile device.

Fully integrates with Siriraj Active Directory for Role Based Access Control (RBAC). Application capabilities and functions are controlled by user's group membership – down to the data element level.



Surgeries covered by ERAS

In July 2021 ERAS went live with four managed surgical procedures:

- Liver (including pancreatic)
- Hip
- Gastric (Upper GI), and
- Prostate cancer

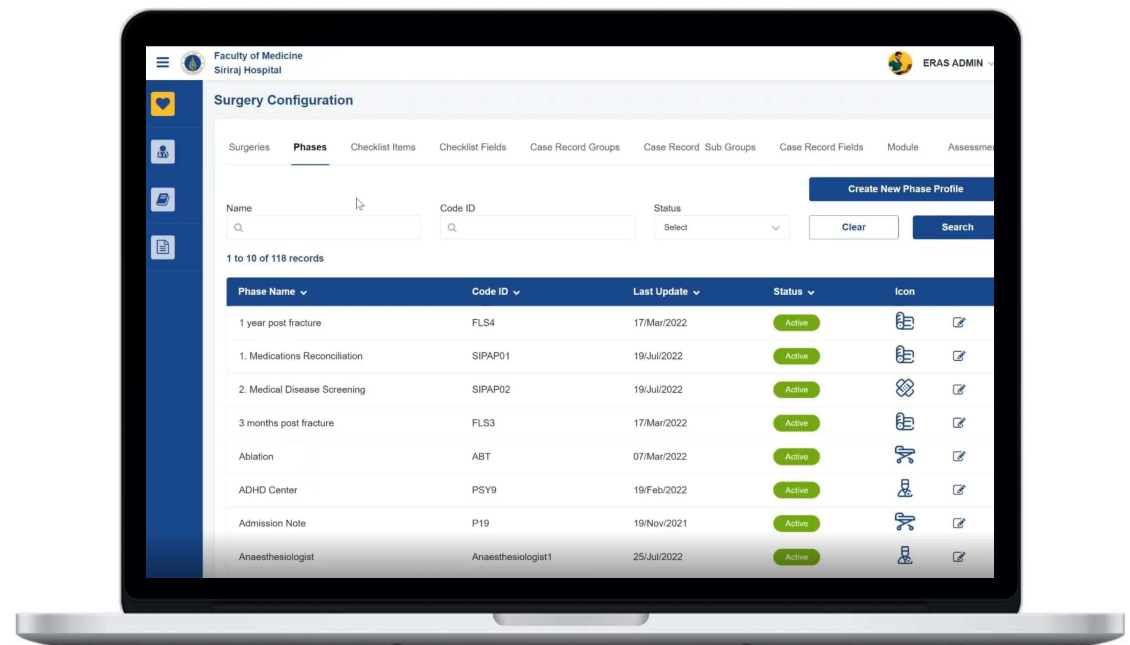
Siriraj business analysts/clinic administrator are now working to add an additional 4 surgeries:

- Oesophageal (Upper GI)
- FLS (laparoscopic surgery)
- Spine
- Breast

The screenshot shows the 'Surgery Profile Creation' interface on a laptop screen. The interface is titled 'Faculty of Medicine Siriraj Hospital' and 'ERAS ADMIN'. It features a 'Surgery Name' section with fields for 'Surgery Name' (Liver & Pancreas (PROD - DO NOT USE)), 'Type Code' (LPb), and 'Module' (test). Below this is a 'Surgery Phases' section with a 'Phase Type' dropdown menu and an 'Add Phase to Surgery' button. The 'Phase Type' dropdown is currently set to 'Select'. The 'Add Phase to Surgery' button is highlighted. Below the dropdown are seven icons representing different surgical phases: Pre-operative at OPD, Pre-operative at Ward, Intra-operative at OR, Peri-operative anaesthetic care, Post-operative at Ward, Follow up, and Admission Note. At the bottom, there are fields for 'Effective From Date' (04/Aug/2022) and 'Effective End Date' (DD/MM/YYYY). There are also checkboxes for 'Checklist required', 'Notification required', 'Case Record required' (checked), and 'Assessment required'. The interface is clean and modern, with a blue header and a white body.

Managed checklists and workflows

- Clinical analysts administer and manage the checklist and case records associated with defined surgical workflows.
- Elements are assigned to roles such as surgeon, specialist, and nursing staff.
- Patient information is integrated with Siriraj's primary hospital system for real-time access.
- Recorded data for patient's surgeries is always available to all users once saved. Includes medications, co-morbidities, allergies, previous clinical history, current interventions.
- Guided workflows per surgery type ensure consistency and procedural compliance.

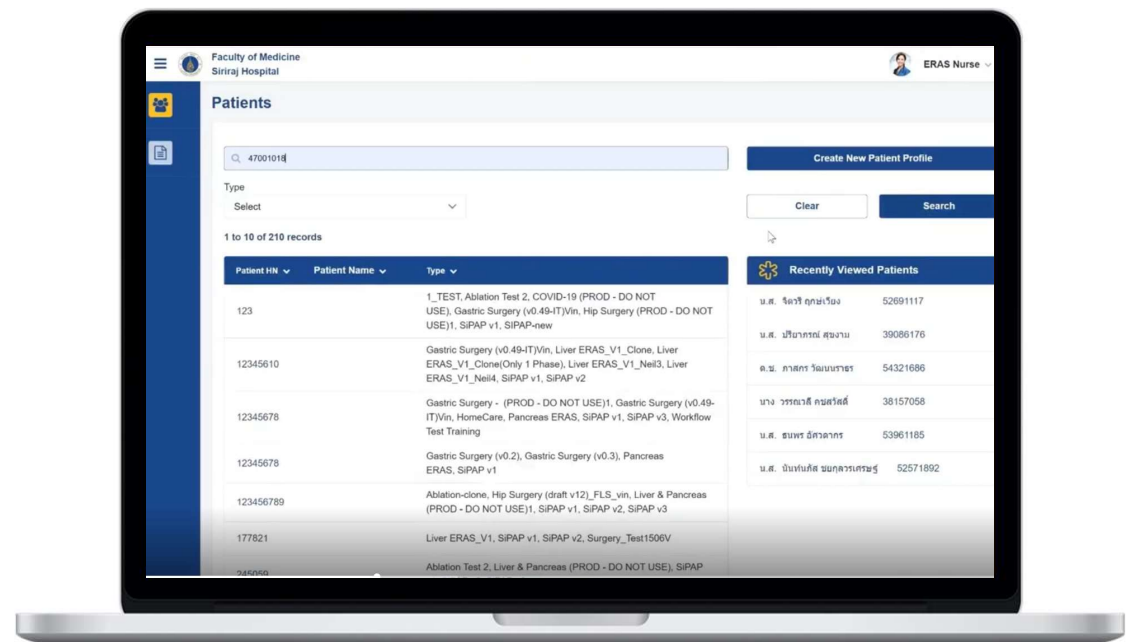


Quick and easy to use interfaces

All parts of the application have been designed to allow fast information retrieval using multiple search fields:

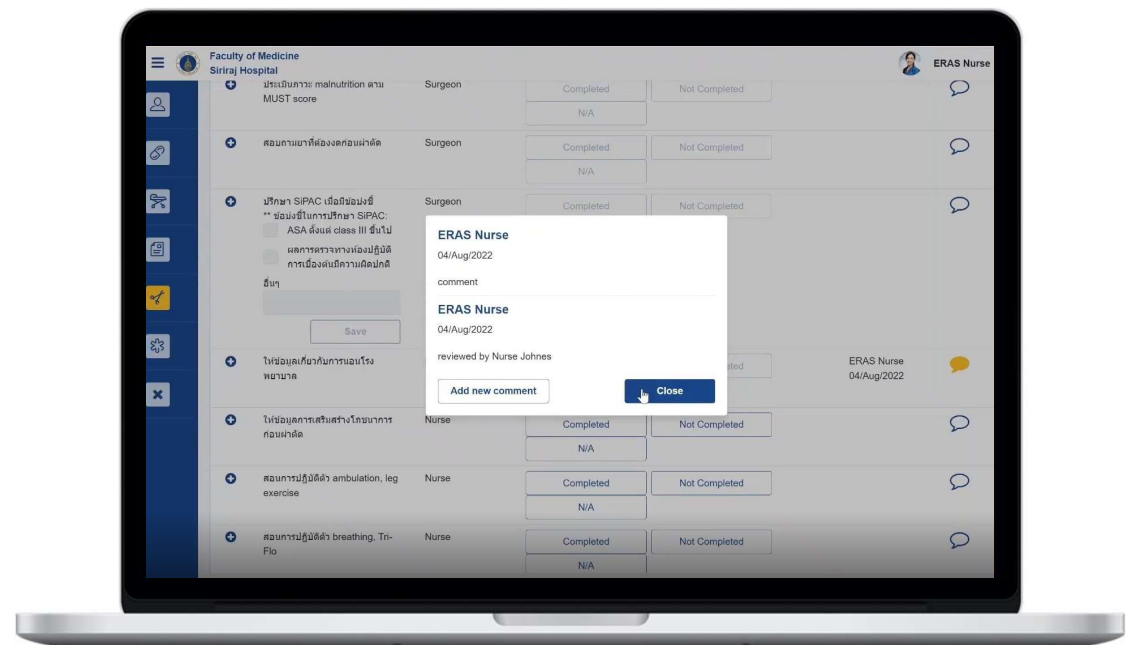
- Patient name or ID
- Surgery name, type, date
- Workflow name, type, phase
- 'Recently viewed' for fast return

Results can then be sorted across displayed data elements at the click of a heading.



Rapid data confirmation & validation

- Users always view existing data prior to adding new data.
- As soon as information is saved all users of the application who are accessing the patient workflow can see that new information.
- New data is saved with date/time and user tags for compliance and auditing purposes.
- Checklist items can be configured as mandatory so that no gaps in data are possible.
- Checklists ensure consistency, compliance and predictability.



ERAS Application Benefits

The ERAS application has shown general improvements in patient outcomes, resource allocation & utilisation, and on-ward compliance across the surgical interventions covered by the solution.



Self Administered

The clinical analysts can now administer the solution's workflows and checklists without ICT intervention.

Improved agility to meet surgeon and specialist requests.



Lower Workload

Guided workflow and inbuilt calculators reduce cognitive load on staff.

Recommended next steps improve consistency and predictability.



Scalable

Solution is designed to have new surgeries and procedures added.

SiPAP (pre-operative) checklists and calculators currently being added.



Better Outcomes

Improved patient outcomes. More efficient use of resources.

Greater visibility of data and improved compliance and reporting.



SEPTEMBER 2024

Thank you

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