INFOSYS IT PORTFOLIO MATURITY ASSESSMENT AND SCALABILITY SCORE (IMASS) FRAMEWORK

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Healthcare costs have been on the rise for patients, providers, payers, and other stakeholders and they continue to increase. One of the major areas of obligatory spending for hospitals is the creation, maintenance, and expansion of their IT portfolio. In an endeavor to remain compliant with the regulations while staying competitive in the market, many hospitals end up with multiple applications (sometimes creating redundancy) leading to interoperability issues. Moreover, contracts with multiple vendors make portfolio maintenance a literal and figurative nightmare. Acquisition of private practices and other hospitals further complicates an already intricate web of applications and vendors, making
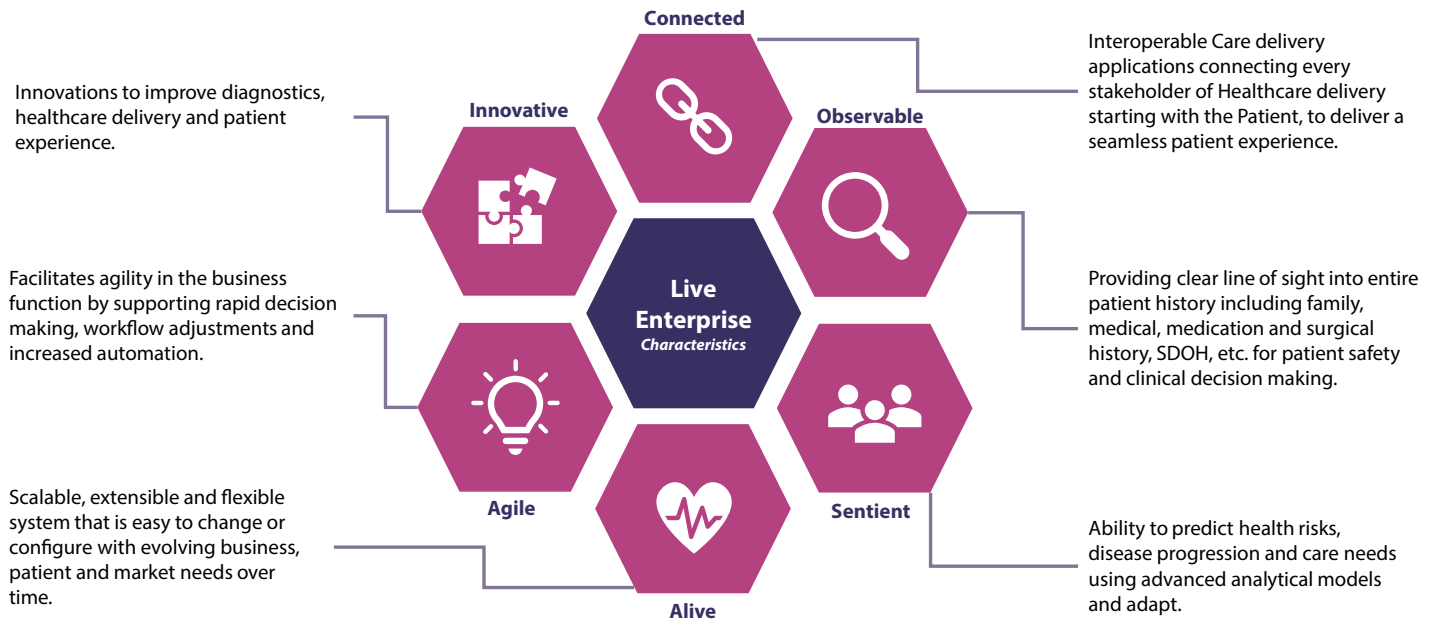
standardization of care across various hospitals under an enterprise difficult. Inevitably, continuity of care and even patient safety may be adversely impacted.

An obvious approach for a hospital enterprise to resolve these issues would be to optimize and rationalize their IT portfolio. One concern which impedes most hospitals from undertaking such an endeavor is the apprehension rooted primarily in end-user (hospital staff) adoption and the change management efforts that would need to be co-initiated.

If the expected outcome of a hospital enterprise which has decided to go for an IT portfolio 'cleanup' is limited to an immediately anticipated cost-benefit, then
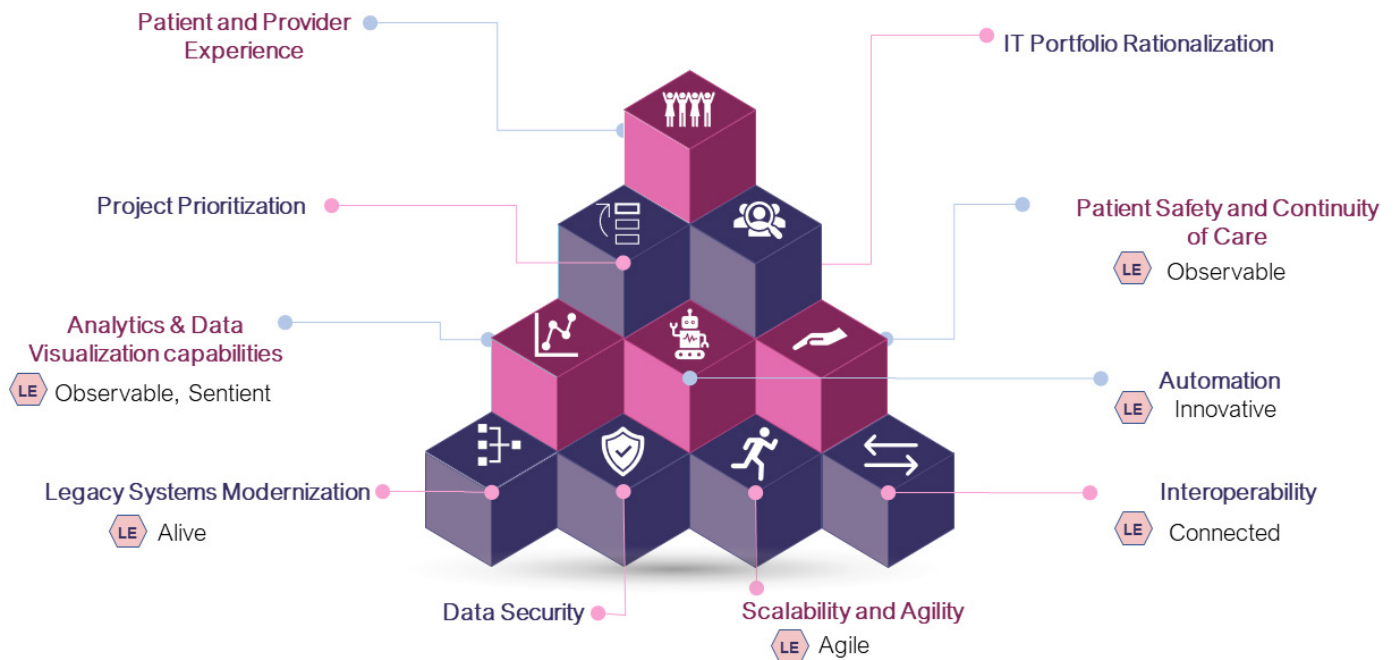
it may miss a golden opportunity to reap long term benefits. These include providing a competitive edge and improving their brand image in areas like quality of care, continuity of care, patient safety and patient experience. We at Infosys believe that the success and competitiveness of any enterprise depend on its ability to continuously evolve, just like a living organism – that is the crux of our 'Live Enterprise' approach. It applies to a hospital enterprise as well, and we have deep-dived into how it's done earlier (refer to - Hospital as a Live Enterprise) – a summary image is shown below. To achieve this, an IT portfolio must also reflect the same characteristics, the applications need to be connected, observable, sentient, alive, agile and innovative.

A Hospital Enterprise and its IT Portfolio need to responsive, adaptable and intelligent like a live organism

Innovations to improve diagnostics, healthcare delivery and patient experience.

Facilitates agility in the business function by supporting rapid decision making, workflow adjustments and increased automation.

Scalable, extensible and flexible system that is easy to change or configure with evolving business, patient and market needs over time.

Innovative

Connected

Observable

Live Enterprise *Characteristics*

Agile

Alive

Sentient

Interoperable Care delivery applications connecting every stakeholder of Healthcare delivery starting with the Patient, to deliver a seamless patient experience.

Providing clear line of sight into entire patient history including family, medical, medication and surgical history, SDOH, etc. for patient safety and clinical decision making.

Ability to predict health risks, disease progression and care needs using advanced analytical models and adapt.

To assist hospital enterprises undertake such a herculean task, Infosys has designed a systematic approach building our **iMASS (Infosys Maturity Assessment Score and Scalability) framework** which supports the enterprise to strengthen their portfolio by focusing on the following aspects:

iMASS (Maturity Assessment and Scalability Scoring) Framework:

Patient and Provider Experience

IT Portfolio Rationalization

Project Prioritization

Patient Safety and Continuity of Care
LE Observable

Analytics & Data Visualization capabilities
LE Observable, Sentient

Automation
LE Innovative

Legacy Systems Modernization
LE Alive

Interoperability
LE Connected

Data Security

Scalability and Agility
LE Agile

To assess the existing maturity of the IT portfolio in the areas mentioned above, iMASS adopts the following approach:

- All applications under the IT portfolio are listed with information such as version, vendor name, architecture, criticality, etc.

- These applications are then categorized under our Provider Value Chain (PVC) into 4 categories: Core Clinical, Ancillary Clinical, Corporate and Operations applications.

- Under each of the PVC categories, applications are sub-categorized to create Functional Groups (FGs). For example, EMR applications would be a distinct functional group from Specialty EMR and device-related software (which would be categorized as separate FGs) under the PVC category of Core Clinical Application.

- iMASS comes with a list of capabilities for each of the FGs and scoring of the existing applications is done while assessing these capabilities (presence, partial presence, or absence), concurrently allowing gap-analysis.

Once the assessment is done for all applications across all the created FGs, we would be able to make recommendations on the next steps to optimize the portfolio, aligning with the business strategy of the hospital enterprise. Once we create the applicable FGs for the applications in a Provider IT portfolio, the assessment of the maturity of the applications under each functional group is underscored by the characteristics of the Live Enterprise concept. There are four layers of assessment:

1. Foundation capabilities

The foundational stakes that are mandatorily expected in every application of a provider portfolio. For the applications scoring low in these capabilities, a remediation plan needs to be created.

- **Interoperability:** Interoperability between various applications within a hospital and between other hospitals within the same enterprise in different locations is important to ensure that all the right information is available at the right time to make the right clinical decision for any patient without delay and to ensure continuity of care. Under iMASS, when we assess FGs, we look at the interfaces between applications within and across the FGs for their stability and efficiency. We additionally look for opportunities for the creation of new interfaces to ensure uninterrupted workflows that are recommended for a Live Provider Enterprise.

- **Scalability and Agility:** We study the ability of the applications to scale to higher volumes as well as the ability to adapt to ever-changing business and population health needs. For applications that score low, remediation recommendations can be varied ranging from application re-engineering to replacement with an alternate system.

- **Data Security:** This is one of the most important requirements for provider applications with regulatory implications and for sustaining the trust of the patients they serve. As part of the iMASS framework, a comprehensive data security assessment is done, and recommendations are made for making the data stored impregnable and establishing stringent access control.

- **Legacy Systems Modernization:** The decision whether to modernize a legacy system or sunset the same and migrate its data would depend on multiple factors such as— the maturity score, the version, vendor, and impact on patient care. Based on these factors underscored by the business strategy we recommend different approaches for legacy modernization. They include — **total transformation**, a **duct-tape approach** where small fixes are made with newer technologies, **gradual replacement** where modernization is done component by component or **improving existing applications** by redesigning the areas that need enhancements. If the legacy systems score high on maturity, then the recommendation would be **not to make significant changes** to such applications.

2. Transformation capabilities

These capabilities are not mandatory but are highly desirable. We look for opportunities to enhance automation, data-driven care management and patient safety in this layer of assessment.

- **Automation:** Our approach to automation is rooted in the fundamentals of human-centric experience design – understanding the end-users – the doctors, nurses, support and administrative staff to understand the manual and repetitive work that they do daily and which of these can be automated. This allows us to customize the iMASS provider automation heatmap that demonstrates the workflows that are amenable for automation. Creating an algorithm for triaging – to determine how the patient may be best helped based on his/her/their symptoms and vital signs (ER visit vs. in-person OPD vs. virtual consultation) or an application that can provide preliminary radiology or a pathology report based on the imaging findings are such examples.

- **Analytics and Data Visualization:** In addition to the FG specific to data analytics, all applications across all functional groups provide data which can be analyzed for insights and patterns which contribute to decision-making both in terms of business and patient care itself. Applications across all functional groups are assessed for their ability to provide data and insights that can contribute to analytics and decision-making. We identify opportunities for increasing the sentient quotient of the hospital enterprise by creating intuitive analytical dashboards. Infosys' iLEAP (Live Enterprise Application Maintenance Platform) provides visibility into the health of the IT portfolio and its ability to proactively intervene before any IT issue arises.

- **Patient safety and continuity of care:** All applications across all functional groups affect or impact a patient or their caregivers directly or indirectly. iMASS assesses all the applications, their impact on patient safety and identifies gaps that impact continuity of care. Leveraging the iMASS framework, recommendations are given to bridge this gap - either by creating new interfaces or with a new application/ enhancement to existing applications – based on the root cause of the gap that has been identified and assessed.
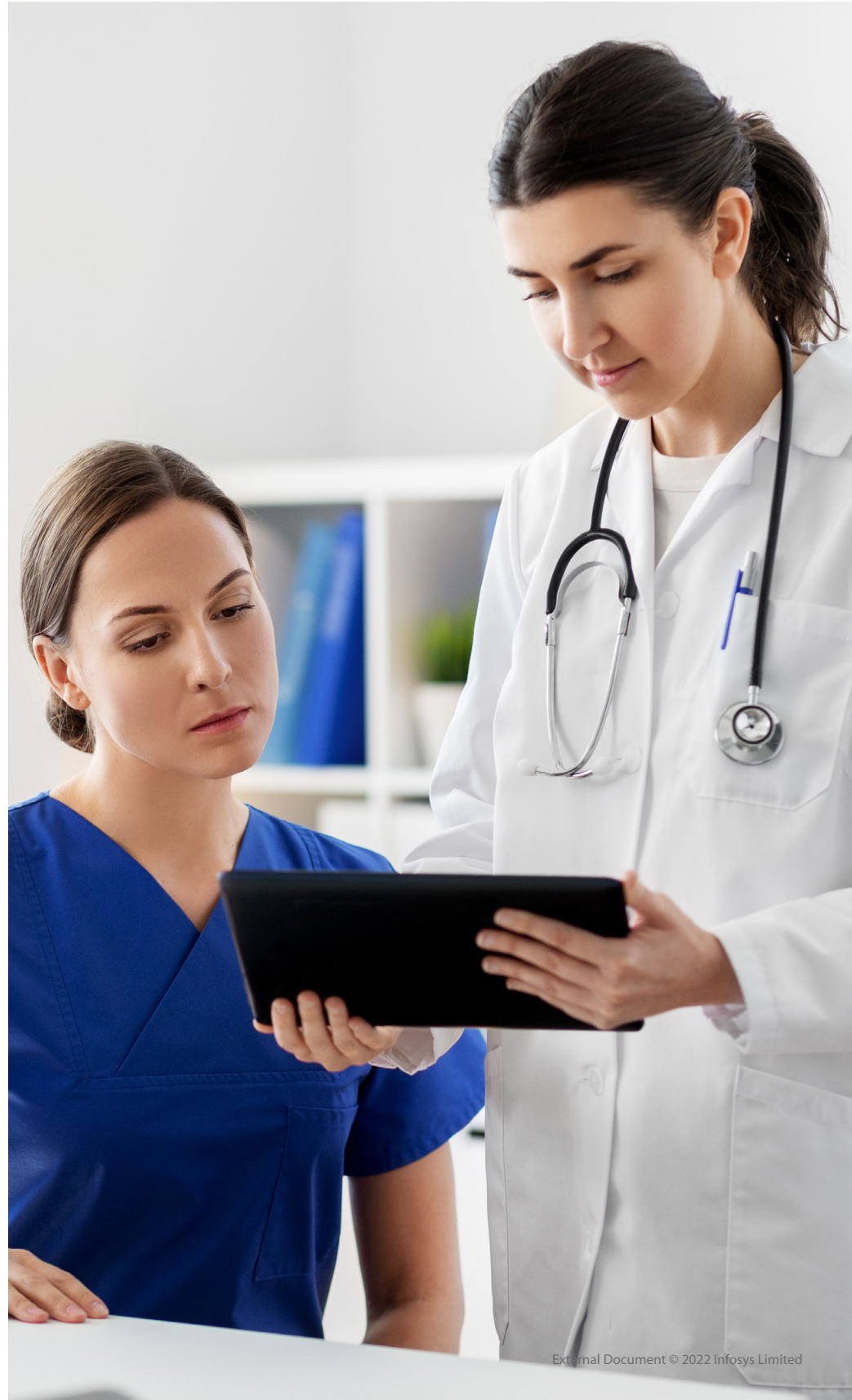
3. Decision making:

Based on the business priorities, this layer of assessment prioritizes certain IT initiatives over others. We also make recommendations regarding streamlining the portfolio through sunsetting certain applications, bringing in new COTS products, or implementing custom platforms that may potentially cover the functions of multiple applications.

- **IT Portfolio Rationalization:** Hospitals and their IT departments face the issue of handling a large number of applications and multiple vendors. The FGs created under iMASS, and the maturity score the applications get assigned allow decision making for individual applications. Applications may be retained as-is, upgraded or eliminated. iMASS framework looks for opportunities to migrate applications to the cloud and for reducing redundancies wherein potentially a single new application can perform the functions of 3 or 4 older ones. The end objective of IT portfolio rationalization is to reduce the overall expenditure on IT portfolio and its maintenance by making it more efficient.

- **Project Prioritization:** iMASS framework's recommendations would include a roadmap towards reaching the goals having assessed the maturity of all applications in the portfolio across the FGs, aligning with the Hospital enterprise's goals and business strategy. The endeavor of the roadmap is to create a self-sustaining model that brings early savings from initial projects which can fund the subsequent projects in the queue.

4. Experience

The ultimate goal of IT systems is to serve internal and external stakeholders with ease of functioning, intuitive information visualization and reduced turnaround time. Applications in functional groups are assessed for the level of experience they are delivering and the opportunities for improvement.

- **Provider and Patient experience** Any application in an IT portfolio of a hospital enterprise is unique as compared to any other enterprise when we think of the end-user experience since it has implications on morbidity and mortality of the 'customers' of the enterprise. Applications which have a responsive UI, assist in clinical decision-making, and do not consume the time of the end-user (healthcare professional) are more likely to be adopted as they do not take time away that can be used to diagnose or treat a patient. When assessing functional groups, capabilities contributing to the above along with enabling patient safety and continuity of care are looked for and impact the maturity score given. Opportunities for improvement are looked for with the goal of enhancing provider and patient experience.

A major chunk of the hospital expenditure goes towards creating and maintaining its IT portfolio. As with any other enterprise, the ultimate goal of such a necessary and heavy investment is appropriate utilization and return on investment – both qualitative and quantitative. iMASS Framework is designed to help the provider utilize the technology they have invested to its fullest potential with optimal cost investment. Taking a lean approach, iMASS framework assesses the current portfolio, identifies gaps, and provides recommendations to fill the same. This would help the provider not only in terms of cost savings but also an IT portfolio which is streamlined, stable and devoid of redundancies. iMASS framework enables the hospital to become a Live Enterprise by transforming their technology to support a Live Enterprise vision.

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