THE ACADEMY

REDUCING MEDICAL ERRORS

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The Academy
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INTRODUCTION

BACKGROUND

In 1999, the Institute of Medicine published a landmark report, To Err is Human, that shed light on the prevalence of medical errors in the United States, finding between 44,000 and 98,000 deaths annually may be attributed to medical errors.[1] However recent research, containing updated estimates of medical errors rates, has attributed approximately 220,000 – 400,000 deaths to medical errors annually in the United States, resulting in medical errors amounting to the third leading cause of death, behind heart disease and cancer.[2;3] Though exact rates are not known, medical errors are prevalent throughout health care delivery systems across the United States and around the world.

A possible strategy to reduce medical errors is through the use of predictive analytics. Predictive analytics refers to using "big data" and statistical processes to identify patterns or generate predictions. In healthcare, predictive analytics are used to predict or determine patient risks and outcomes.[4] This technology is currently in use, from early to advanced stages, across the healthcare spectrum. Additionally, health systems, hospitals, and providers are using predictive analytics to reduce medical errors. The University of Chicago, for example, is using machine learning methods with an early warning score to improve the lead times for cardiac arrest predictions from minutes to hours – even days.[5] This report seeks to explore current perceptions and efforts among health systems administrators to reduce medical errors, as well as to examine the current and future role of predictive analytics in the reduction of medical errors in health systems throughout the country.

KEY FINDINGS

- Medical errors are high priority for health systems with a majority (65%) of executives ranking the significance of the issue as a 4 or 5 on a 5-point scale
    - Almost all (91%) executives rank reducing medical errors as a high or very-high priority compared to other clinical initiatives at their health system.
- Over half of responding health systems are most concerned about medical errors including failure of communication (70%), error or avoidable delay in diagnosis (61%), inadequate monitoring to reduce risk of serious medical error (52%), failure to act on monitoring or testing results (52%), and error or avoidable delay in administering treatment (52%).
- Most health systems utilize strategies including checklists (91%), alerts in the EMR (91%), standardizing clinical practice (91%), and education and training (83%) to reduce medical errors.
- Among responding health systems, the most common barriers to error reduction initiatives include standardizing clinical practice (61%), culture (57%), and physicians' time (52%).

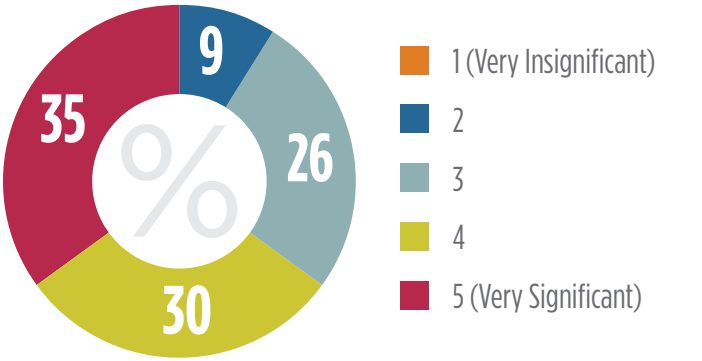
SURVEY RESULTS

MEDICAL ERRORS AT LEADING HEALTH SYSTEMS

SIGNIFICANCE OF MEDICAL ERRORS

Leading Health Systems recognize the importance of medical errors at their facilities, with a majority (65%) of executives rating significance of medical errors to be a 4 or 5 on a 5-point scale, where 1 is very insignificant and 5 is very significant (Figure 1). Executives who rated significance at 3 or below commented that while medical errors are significant, they have seen improvements in error rates due to new initiatives aimed at error reduction.

FIGURE 1. HOW SIGNIFICANT OF AN ISSUE DO YOU BELIEVE MEDICAL ERRORS TO BE IN YOUR HEALTH SYSTEM?



> "We have our fair share [of medical errors], but they aren't highly significant and we have done a lot recently to improve" (CNO).

All executives agreed that their health systems are committed to reducing medical errors. Reflective of this commitment, almost all (91%) executives rank reducing medical errors as a high or very-high priority compared to other clinical initiatives at their health system.

Nearly 100% of respondents stated that medical error reduction initiatives are part of a larger effort, usually categorized as part of quality and safety programming. In fact, numerous executives echoed that medical error reduction is bundled into "high reliability" initiatives.

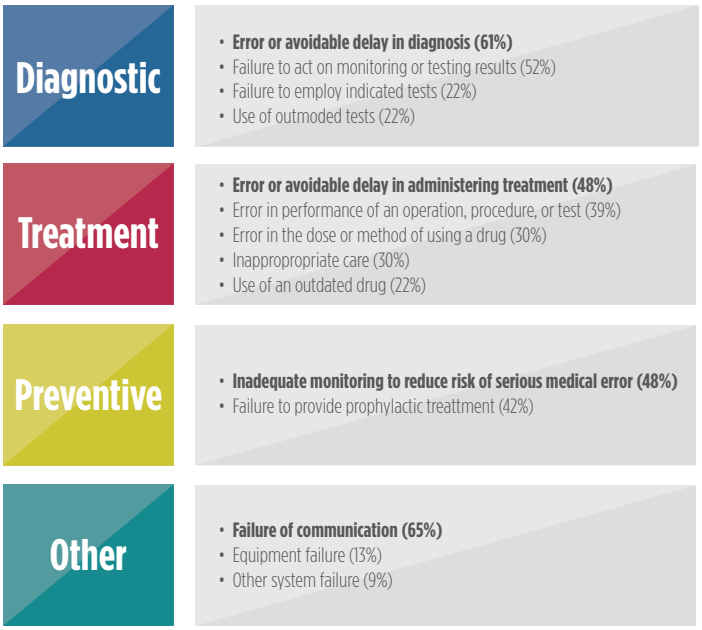
MOST CONCERNING TYPES OF MEDICAL ERRORS

The types of errors most commonly reported by health systems include diagnostic, treatment, and preventive errors, as well as other system failures. Figure 2 illustrates the types of medical errors executives at Leading Health Systems are most concerned about. The most common error reported as primary concern across health systems was failure of communication (65%). Numerous health executives identified communication as a core issue and recognized the necessity of improved communication.

> "Failure of communication is overarching above everything else. We are aware, but it's not communicated." (CMIO)

Over half of health systems reported diagnostic errors related to error or avoidable delay in diagnosis (61%) and failure to act on monitoring or testing results (52%), with one executive commenting, **"Delays and diagnosis are most relevant" (CMO).**

FIGURE 2. WHAT TYPES OF MEDICAL ERRORS ARE YOU MOST CONCERNED ABOUT ACROSS YOUR HEALTH SYSTEM?

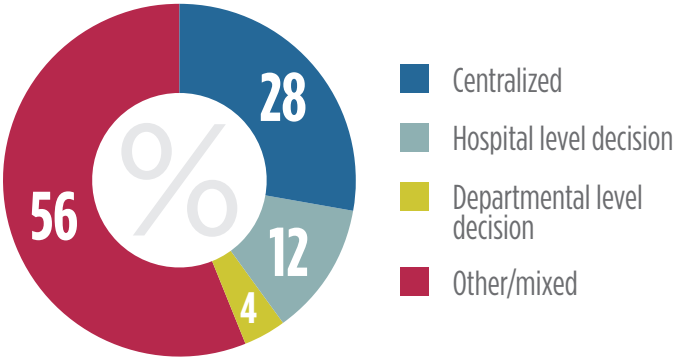


Treatment is also an area identified by health systems executives as source of error, with almost half (48%) of respondents reporting error or avoidable delay in administering treatment as a top concern. Another area of concern relates to preventive care, specifically, the inadequate monitoring to reduce risk of serious medical error (48%). Several executives noted that their health systems focus on these areas over other areas, not only because failure to address these types of errors put patients at risk, but also can also significantly drive up costs.

ORGANIZATIONAL STRUCTURE & DECISION MAKING

Most health system executives reported a mixed approach to decision making in medical error reduction efforts (Figure 3). In total, 56% of executives described decision making in their organizations as a combination of centralized and decentralized. A common theme that emerged was that these health systems use centralized decision making to steer medical error reduction strategy, and local decision making to implement the strategy.

FIGURE 3. HOW CENTRALIZED ARE DECISIONS REGARDING INITIATIVES TO REDUCE MEDICAL ERRORS?



> "We have a system-wide strategic plan for patient safety. It's something we are trying to operationalize. This occurs at the hospital level and then moves down to the unit level. It's mixed." (CQO)

Health system executives who reported centralized decision-making (28%) described themes similar to the above, in that prioritization, expectations, and culture are set by the system as a whole.

Most executives reported that their health systems have distinct Quality and Safety Departments, or similar. These departments exist at the system-level, as well as at hospital and/or departmental levels. In the health systems surveyed, it was common for lower level departments to report up to a single, centralized department. In health systems without a centralized Quality and Safety Department, responsibilities related to medical error and patient safety fell under the purview of Chief Medical Officer and Chief Nursing Officer.

Other key executives involved in medical error initiatives include Chief Safety Officers (CSOs), Patient Safety Directors (PSDs) (including physicians and nurses), Chief Quality Officers (CQOs), Chief Transformational Officers (CTOs), Chief Health Information Officers (CHIOs), and others. Numerous health systems described utilizing a "dyad" system, where two or more different branches work together to address quality and safety, for instance, CMOs and CNOs or CMOs and CSOs.

> "At the system level, it's dyad ownership with the CMO and CNO. The CMO has safety and medical error reduction efforts in the job description." (CNO)

Almost universally, health systems reported that medical error reduction is part of a larger initiative, such as quality and safety or high reliability strategy. Some participants described programs specifically geared towards the reduction of medical errors, while others shared that error reduction often stems from efforts to reduce hospital acquired conditions or similar quality-oriented objectives.

This grouping creates some challenges, however. One executive noted that it can be hard to find capital funding for medical error reduction initiatives, specifically, as they are often grouped under a larger department or cost center. Another executive elaborated that while quality improvement is included in many payment models, **"[medical error reduction] is not getting emphasized in some payment models. Our approach is more that [medical error reduction] is consumed inside broader quality improvement, but not called out as a unique initiative." (CQO)**

MEASURING IMPROVEMENTS IN PATIENT SAFETY

Health systems executives reported a broad array of methods to measure improvements, ranging from voluntary reporting of medical errors to hospital acquired infection (HAI) rates. One key method that appeared across many health systems was the goal to achieve "zero harm." In all, 58% of health systems executives reported that zero harm was their primary goal with regard to medical error measurement and improvement efforts.

> "We value zero harm highly. We don't just use stats – we look at raw numbers, and our ultimate goal is zero" (CNO).

Other health systems executives, however, shared the challenge of achieving zero harm status. One CQO acknowledged, **"Not all of our hospitals are accepting the zero harm premise, but they're trying to get there."**

GOVERNANCE AND OVERSIGHT OF MEDICAL ERRORS AND REDUCTION INITIATIVES

In their responses, health systems executives identified many different ways that health systems address medical errors. Primarily, the processes described involve committee review and escalation as needed, depending on the severity of the medical error. For over half (57%) of health systems, an overarching quality/safety council or similar committee conducts the review. In nearly 44% of health systems, executives reported that there was c-suite or executive team involvement in the review, with key executives including CEO, CMO, CNO and others. Approximately one-quarter (26%) of health systems have medical error review processes that take place at the Board level. Similarly, 26% of executives reported error review processes that take place solely at the local, or hospital level.

> "Dealing with errors is local, but it is important to aggregate up to the executive and board quality and safety committee to see if the problem is more systemic than local." (CNIO)

In health systems that had Board involvement, several executives described having board quality and safety subcommittees specifically created for error review. In addition to reviewing medical errors, executives described Board involvement as having a steering role.

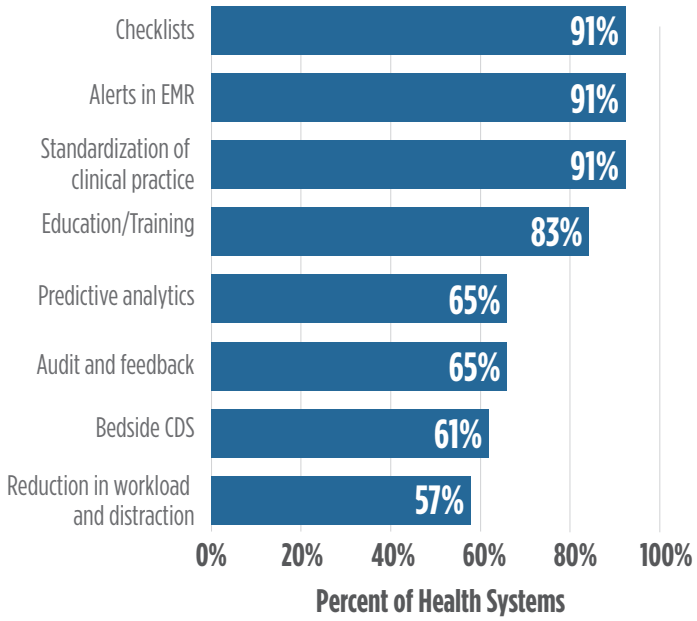
> "The Board is educated in high reliability, and this is the focus for the whole organization. To get the organization behind high reliability, you need support of the Board and CEO." (CMO)

ERROR REDUCTION EFFORTS AT LEADING HEALTH SYSTEMS

CURRENT ERROR REDUCTION STRATEGIES

Executives reported utilizing numerous strategies to reduce medical error rates within health systems. These include checklists (91%), EMR alerts (91%), standardizing practice (91%), education and training (83%), predictive analytics (65%), audit and feedback (65%), bedside clinical decision support (61%), and reduction in workload and distraction (57%) (Figure 4). In addition to the strategies listed, executives identified other strategies utilized in medical error reduction efforts including closed loop medication administration, tele-sitter and remote monitoring technology, and education specifically emphasizing the chain of command.

FIGURE 4. WHICH OF THE FOLLOWING ARE YOU USING TO REDUCE MEDICAL ERRORS?

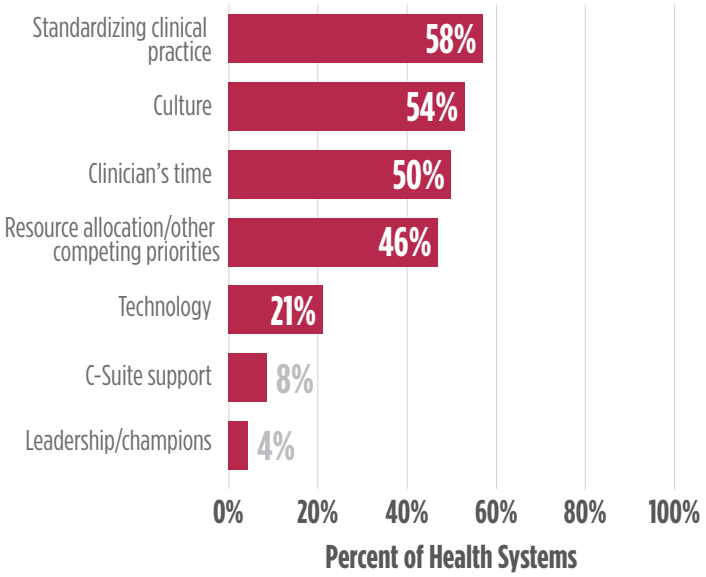


Of the strategies identified, many executives recognized standardization of clinical practice and reduction in workload and distraction as pivotal to reduction of medical errors.

> "We have always had a strong foundation in education and training, but it's not enough. We need to build in system processes and structures to help individuals remember – and can do so through alerts and standard orders. It's really promoting standard work." (PSO)

Executives also noted challenges and inefficiencies regarding these error reduction strategies, with one executive stating, "**I am not a fan of checklists – people just check off boxes to check off boxes. They are effective reminders, but do they drive behavior?" (CSO)** Additionally, many executives identified alert fatigue as a key concern. In fact, several executives reported that their health systems have worked to reduce alerts in EMRs in order to address this concern.

FIGURE 5. WHAT ARE THE TOP 3 BARRIERS THAT EXIST TO GAINING SUPPORT FOR PROGRAMS TO REDUCE MEDICAL ERRORS?



BARRIERS TO ERROR REDUCTION EFFORTS

The top barriers to gaining support for medical error reduction programs as reported by respondents include standardizing clinical practice (58%), culture (54%), and clinician's time (50%) (Figure 5).

> "Changing culture is difficult. Our health system's number one focus is on error reduction and trying to change culture." (CEO)

Health system executives also reported that a rapidly changing healthcare environment has impacted culture and led to change fatigue, making it difficult to implement and prioritize new initiatives across the health system.

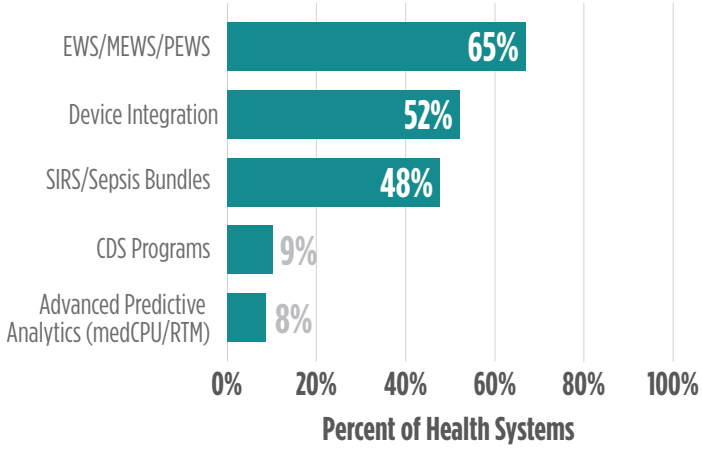
> "There's been a lot of change. Mergers, census, and volume fluctuations have increased drastically. Safety is not always at the top. Our goal is to get more people to focus on safety and error reduction, but our challenge is different cultures across units and throughout the organization" (CTO).

While technology was identified as a method to promote standardization, many health systems reported challenges around implementing multiple new initiatives with competing priorities at the same time.

> "It's difficult to maintain focus – there are lots of competing priorities. We pick one focus area every year to try to target specific things and put resources towards those things." (CNIO)

Reflective of this theme, two health systems identified change management as a key barrier to medical error reduction efforts. An executive noted, **"Change management, not only for medical errors but in other practice initiatives, is our biggest hurdle" (CMIO).**

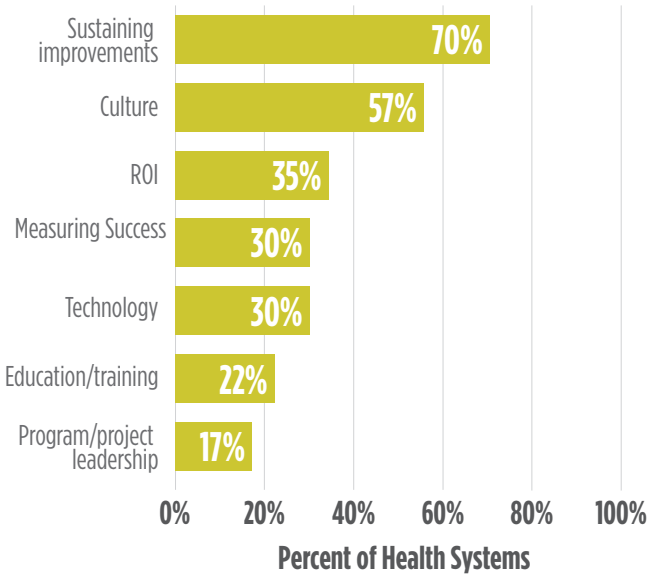
FIGURE 6. WHAT EFFORTS HAVE YOU INITIATED TO MITIGATE THE RISK FOR SERIOUS ADVERSE EVENTS IN YOUR GENERAL WARDS?



TECHNOLOGIES USED IN REDUCTION EFFORTS

There are various tools and technologies currently being used across health systems to help in medical error reduction (Figure 6). The most commonly reported technology in use is the early warning score (EWS) system – 65% of health systems reported using EWS, including pediatric early warning score (PEWS) and modified early warning score (MEWS). Additionally, 52% of health systems stated that they used device integration in at least one clinical area. Many executives recognized sepsis as a primary concern, and 48% reported using SIRS or sepsis bundles in care delivery. Nearly 9% of health systems currently utilize clinical decision support technology. Only one health system described using advanced predictive analytics, though several executives shared that there were plans to pilot more advanced technologies.

FIGURE 7. PLEASE RANK THE TOP 3 CHALLENGES CURRENT MEDICAL ERROR REDUCTION INITATIVES FACE.



CHALLENGES FACING CURRENT STRATEGIES

When asked to rank the top three challenges that current medical error reduction initiatives face, most (70%) executives identified sustaining improvements as the primary challenge to current medical error reduction initiatives (Figure 7). Behind sustaining improvements, culture was the second most significant challenge reported (57%).

> "It is difficult to sustain improvements. The change doesn't always remain if focus is removed, unless the process is hardwired." (CNIO)

Other top challenges include return on investment (35%), measuring success (30%), technology (26%), education/training (22%), and leadership (17%).

FUTURE APPROACHES TO REDUCING MEDICAL ERRORS

TOOLS/TECHNOLOGIES FOR FUTURE EFFORTS

Health system executives articulated interest in implementing new tools and technologies to reduce medical errors. These tools and technologies included sepsis bundling, surgical technologies such as a wand that detects retained foreign objects, medication administration barcode systems, and others.

The most common technologies identified for future implementation were robust clinical decision support technology and advanced predictive analytics.

> "Predictive modeling around pressure injuries, readmissions... will be cornerstone of what we do. How we can support that critical thinking, looking for patterns in data sooner rather than later, can enhance situational awareness and support what we do" (CQO).

PREDICTIVE ANALYTICS IN HEALTHCARE

Many executives agreed that a significant barrier to utilization of predictive analytics across health systems is the lack of reliability and precision in generating meaningful predictions.

> “One of the biggest issues is relevance and sensitivity of predictive analytics at the point of care. The predictive capability varies based on where you are and what you document” (CQO).

Another executive echoed, **“We don’t want to be held liable for wrong predictions or predictions that don’t come true” (CMO).**

Alert fatigue is another common concern. **“Alerts are not very specific, and this contributes to over alert and alert fatigue. It needs to be truly meaningful - right now there’s a 50% chance it’s getting it right.” (CMIO)**

Despite these concerns, the large majority of executives believe that predictive analytics will play a crucial role in care delivery in the future. To be widely implemented, executives reported that predictive analytics must be specific and discerning. In addition to early sepsis detection and readmission risk, predictive analytics could be used to predict trends in patient populations over time, identify preventable medical errors before they occur, and expand beyond the acute care setting into the primary care community.

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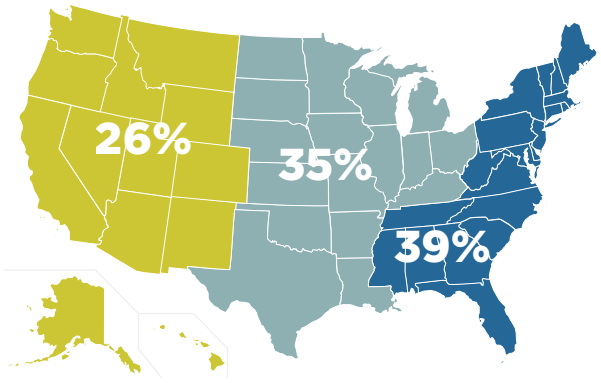
PROFILE OF PARTICIPATING HEALTH SYSTEMS

Representative of the various regions of the U.S.

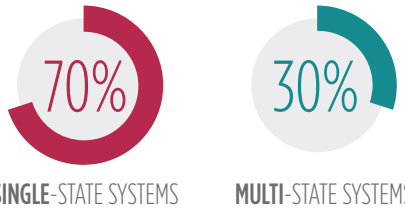


AVERAGE NET PATIENT REVENUE

$6.1 BILLION

OWN OR OPERATE **482 HOSPITALS** WITH **94,797 BEDS**

APPROXIMATELY **4.6 MILLION** ADMISSIONS ANNUALLY



SINGLE-STATE SYSTEMS

MULTI-STATE SYSTEMS

PARTICIPATING HEALTH SYSTEMS

METHODOLOGY

From January 2017 through April 2017, The Academy conducted interviews with 24 senior executives from Leading Health Systems. Participants included Chief Medical Officers (CMOs), Chief Nursing Officers (CNOs), Chief Medical Informatics Officers (CMIOs), Chief Nursing Informatics Officers (CNIOs), Quality and Safety executives, Chief Information Officers (CIOs), Chief Technology Officers (CTOs), and others. This report presents current perspectives on medical error reduction, strategies and technologies being used today, and approaches to be implemented in the future.

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