Money has been allocated to deliver on the Department of Health and Social Care's mandate to have a fully digital health and social care system by 2025, but such targets have come and gone before. Candesic's **Dr Michelle Tempest**, **Buzz Gilks** and **Dr Jye Quan** look at doctors' attitudes towards IT and explore if the holy grail of connectivity and personalised health can finally come to fruition
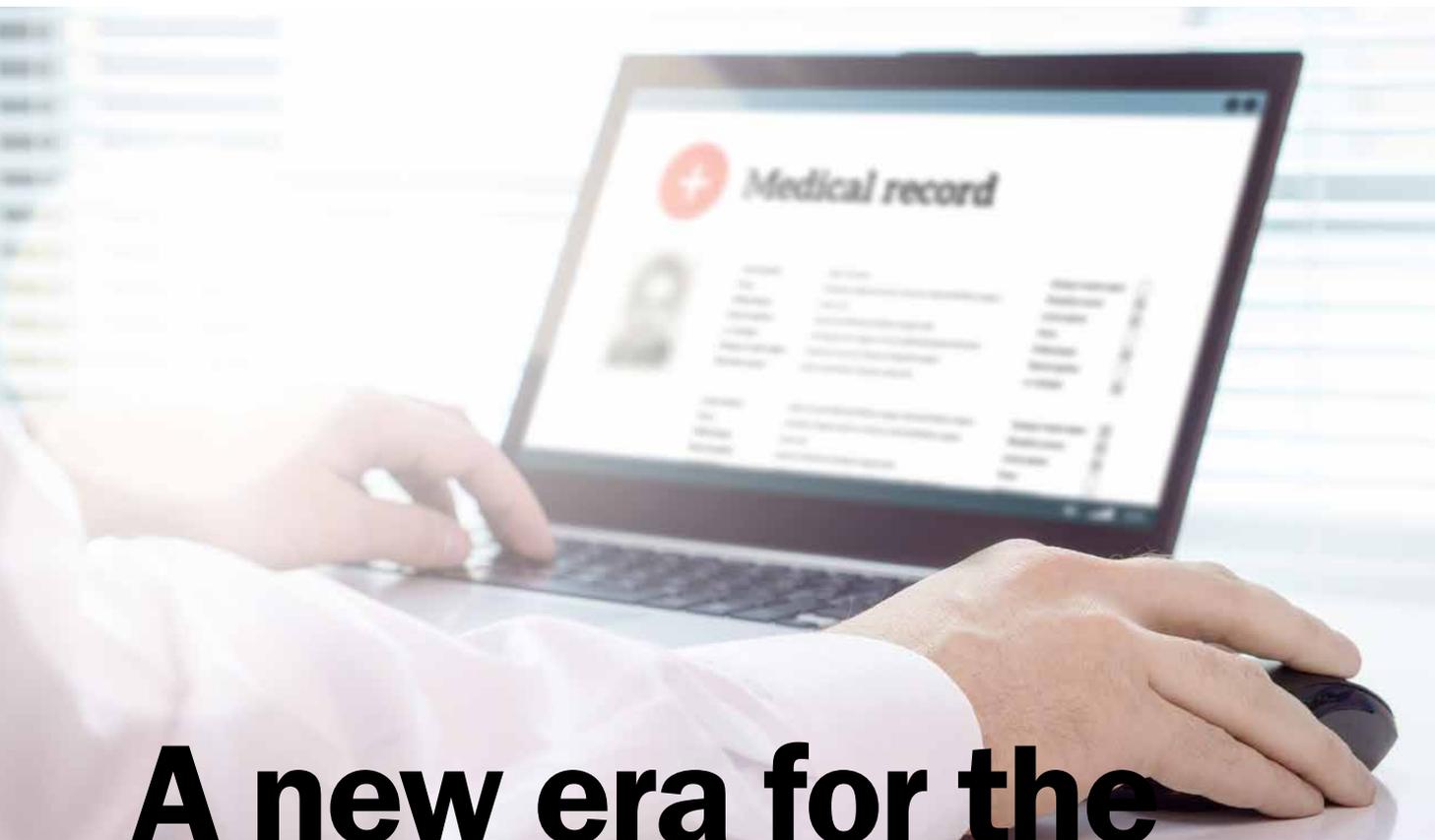
A new era for the
Electronic Patient Record?

Integrated Care Systems (ICSs) have been allocated £2bn to spend on delivering digital health records and interoperability across all NHS Trusts[1] – linking secondary, primary, community and social care settings.

Similar targets introduced in the past have proved elusive, but if there were any silver lining to the Covid-19 pandemic it would be the rapid acceleration of digital capabilities within the NHS.

To maintain momentum in digital solutions, the ICS's will need to rapidly deploy the £2bn across hardware, software, electronic prescribing systems, electronic referral systems and interoperability. Currently, 86% of UK NHS Trusts use EHRs; the remaining 14% remain on paper health records.[4] However, results pub-

lished 30 June 2022 show only 23% of NHS trusts are using EHRs that meet the required standard – the government's plan sets out to increase this number to 100% in less than three years.[3]

The Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM) score is an international quality standard which measures the adoption and maturity of a health facility's inpatient EHR capabilities from stage 0 (least digitally mature) to 7 (most digitally mature). While the plan's target is for all NHS hospitals to reach at least EMRAM stage 5 by 2025, currently a third of NHS Trusts are rated stage 0–4, with only eight NHS Trusts rated as either HIMSS EMRAM stage 6 or 7.[5,6]

Hardware, software and WiFi – all needed for interoperability

Across the NHS, there are over 20 different EHR suppliers with Cerner, SystemC and Dedalus making up almost 50% (see Figure Four). IT infrastructure within any organisation comprises of multiple components including hardware, software, networks, servers, data storage capability and Wi-Fi. However, unlike other organisations, the IT infrastructure within the NHS is highly heterogeneous, inconsistent, and outdated.

There is no database systematically detailing all hardware and software in use meaning the NHS does not even know what it has, let alone have the

capability to protect it or upgrade it.

As of 2020, 57% of NHS computers were running an outdated version of Windows – Windows 7 (released in 2009) or older – which was no longer supported by Microsoft.[9] For context, Windows 8 was released in 2012 and Windows 10 was released in 2015. These figures suggest that 57% of NHS computers are at least ten years old. University Hospitals Birmingham, a Global Digital Exemplar (GDE) hospital, spent just 10% of its £10m GDE funding on hardware.[10]

Additionally, there are concerns around cyber-security. Patient data can be 10–15 times more valuable to hackers than credit card data (a fact that many in health care are unaware of) and the NHS is vulnerable to cyber-attack.[11, 12] A review by William Smart, chief information officer for Health and Social Care in England, stated that 'most trusts needed to upgrade firewalls, improve network resilience and segmentation, improve device security through device replacement and automation of patch management, and improve anti-virus protection.[13] In 2018, 100% of the 200 NHS Trusts (out of a total of 219 NHS Trusts) tested failed their on-site cyber-security assessments using the Cyber Essentials Plus standard and other relevant information.[14,15,16] This was just ten months after the May 2017 WannaCry cyber-attack, which affected 80 NHS Trusts and which cost the NHS £92m, and after the government invested £60m in 2017/2018 to improve NHS cyber-security.[17]

All WannaCry-affected organisations, including the 80 NHS Trusts, shared the same specific Microsoft Windows vulnerability. None of these 80 NHS organisations had followed IT security best practice – which could have protected them from the attack– and applied the Microsoft update patch advised by NHS Digital's Care CERT bulletin in April 2017 following the receipt of intelligence of a specific threat from BT.[13,18]

Although 97% of NHS hospitals have Wi-Fi, speeds, reliability and coverage vary significantly.

Almost 40% of NHS organisations rely on slower and less reliable copper-based infrastructure (not the faster and more reliable fibre optic-based infrastructure). This restricts the ability to offer digital health care, including fast and consistent EHR solutions.[20] So, although EHR's get a lot of blame from frontline staff it's worth remembering the impact of inadequate hardware, WiFi and cyber-security.

ICS must make the digital mandate work

Previous governments have been scarred by trying to digitalise hospitals. One example was the infamous National Programme for IT which aimed to top-down implement digitisation across the NHS. In 2002, the Department of Health paid four suppliers (Computer Sciences Corporation, BT, Accenture and Fujitsu) to provide EHRs. However, the programme was dismantled in 2011 after escalating costs of £12.7bn.

PATIENT DATA CAN BE 10–15 TIMES MORE VALUABLE TO HACKERS THAN CREDIT CARD DATA AND THE NHS IS VULNERABLE TO CYBER ATTACK

In 2014, the *NHS Five Year Forward View*, outlined another plan to digitalise NHS health care.[23] By 2015, the Health Secretary at the time, Jeremy Hunt, outlined the government's target to introduce a comprehensive system of interoperable EHRs in England to achieve a 'paperless' NHS by 2020.[24,25] Neither of these targets were met.

Hopefully, by 2025, ICS's will rejoice in their success to digitalise health and social care. When Candesic spoke with key people on Integrated Care Boards, there seemed to be some optimism around digital care getting delivered. Board members see digital as vital for any functioning modern care setting and discussed three broad implementation approaches:

- Mandate a single enterprise-wide EHR system across all hospitals, delivering ICS wide hospital integration. They were also planning to mandate all other systems to interoperate with the chosen EHR or to exit

- Encourage the use of several 'best of breed' EHR systems across hospitals and departments and mandate interoperability

- Invest and develop in-house systems built by the NHS and encourage these to spread from hospital into community settings

Overall, workforce shortages are the most pressing issue for frontline care, but this can only be solved alongside solutions for digital care.

Healthcare IT companies can deliver on all the wonders of AI and automating the more laborious human tasks after ICSs have delivered on their digital mandate. Hopefully, one day soon frontline staff will be able to reap the rewards of interoperability and EHR's will be lauded for clinical decision support tools and improving clinical outcomes.

As the UK government spends on delivering interoperability, operators and investors have the opportunity to prepare EHR's to lead the way in the digital marketplace.

Customers of the future will not only be NHS commissioners but will include every digitally connected person at home – a truly global market.
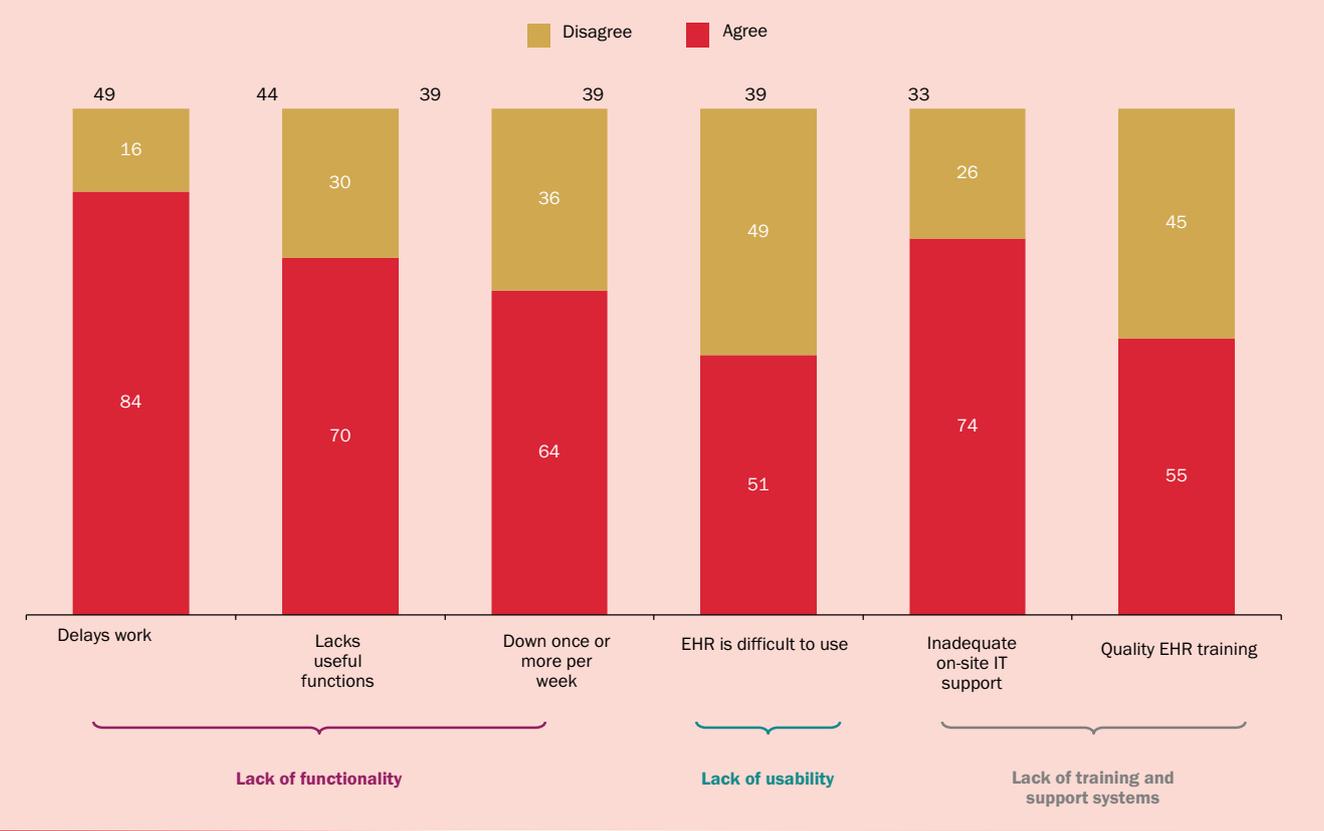
See the results of Candesic's NHS doctors and digital experiences survey on the following pages.
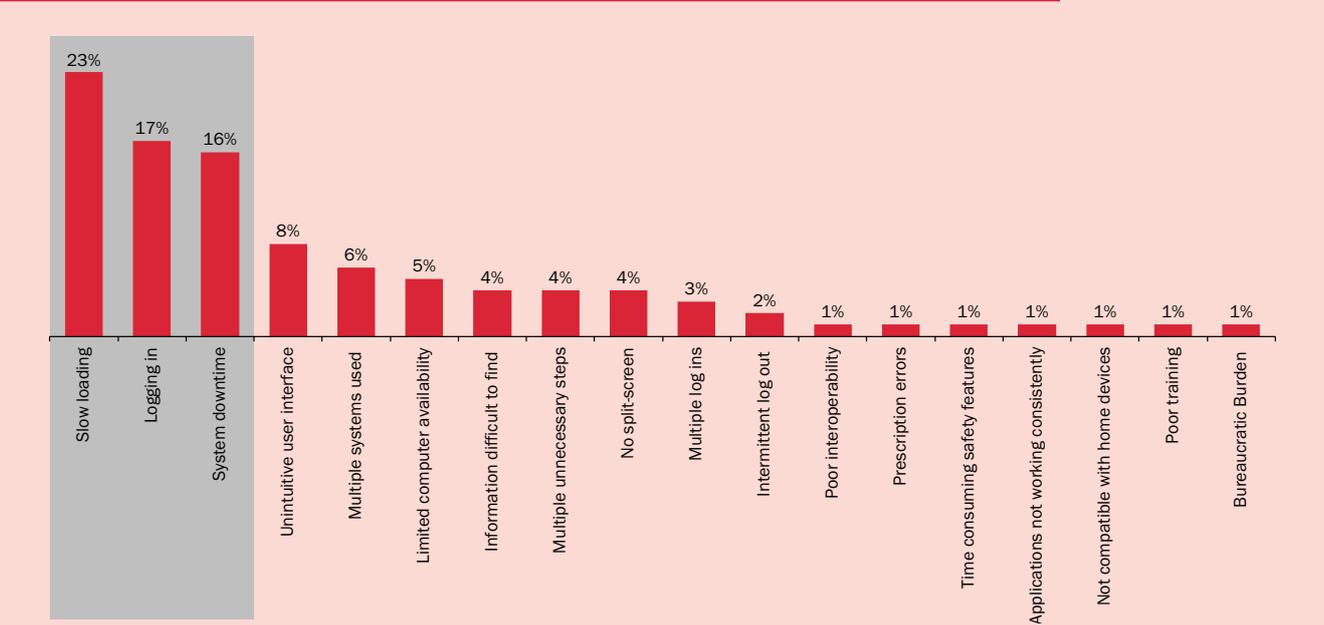
CANDESIC SURVEY

Taking the temperature of **hospital IT**

FIGURE ONE
CANDESIC SURVEY – ATTITUDES OF DOCTORS TOWARDS EHRs

Disagree ■   Agree ■

	Disagree	Agree
Delays work	16	84
Lacks useful functions	30	70
Down once or more per week	36	64
EHR is difficult to use	49	51
Inadequate on-site IT support	26	74
Quality EHR training	45	55

Totals above bars: 49, 44, 39, 39, 39, 33, —

Lack of functionality — Delays work, Lacks useful functions, Down once or more per week

Lack of usability — EHR is difficult to use

Lack of training and support systems — Inadequate on-site IT support, Quality EHR training

SOURCE CANDESIC RESEARCH AND ANALYSIS

FIGURE TWO
USER REVIEW SUMMARY – REASONS FOR DELAYED WORK WHEN USING EHR SYSTEMS, %

Reason	%
Slow loading	23%
Logging in	17%
System downtime	16%
Unintuitive user interface	8%
Multiple systems used	6%
Limited computer availability	5%
Information difficult to find	4%
Multiple unnecessary steps	4%
No split-screen	4%
Multiple log ins	3%
Intermittent log out	2%
Poor interoperability	1%
Prescription errors	1%
Time consuming safety features	1%
Applications not working consistently	1%
Not compatible with home devices	1%
Poor training	1%
Bureaucratic Burden	1%

SOURCE CANDESIC RESEARCH AND ANALYSIS

Candesic surveyed over one hundred front line NHS doctors to understand their digital experiences. Predictably, there was disappointment, as digitally native young doctors who grew up with iPads are forced to interact with legacy hospital IT systems. Yet, more surprisingly was the growing dissatisfaction around basic functionality, usability and training (see Figure One).

Functionality

All clinicians want digital systems to benefit their patients and reduce workload. Yet 84% of respondents felt EHRs delayed their work.

The three most common reasons cited were: being slow to load, delayed log in and frequent system downtime (crashes/freezes/updates happening more than once per week) (see Figure Two).

Usability

Young doctors wanted more intuitive usability. 70% reported their EHR lacked useful capabilities such as: no access to medications, poor prescribing interfaces and no ability to split the screen to view diagnostic results and notes together.

Training and support

While 85% of respondents received EHR training, only 55% rated the training as good. Almost a third of doctors reported no dedicated on-site IT support team to call if they experienced problems and instead resorted to asking friends (see Figure Three).
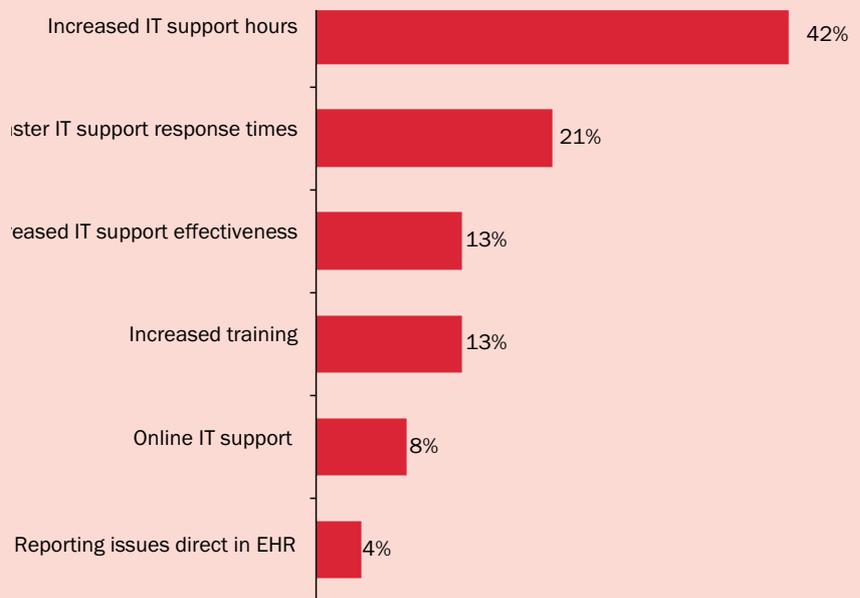
Although there is potential for sampling bias in any survey, these findings reflect other studies.

A survey commissioned by NHS England asked 4,852 doctors working in 147 NHS Trusts (ran from December 2021 to May 2022) also found EHR's were not easy to use.[2,3]

In 2018, the British Medical Association (BMA) surveyed its members and reported: 'Almost a quarter (22%) of respondents believe that IT systems at their place of work are not fit for purpose – specifically the electronic medical record (57%) and current operating systems (55%).
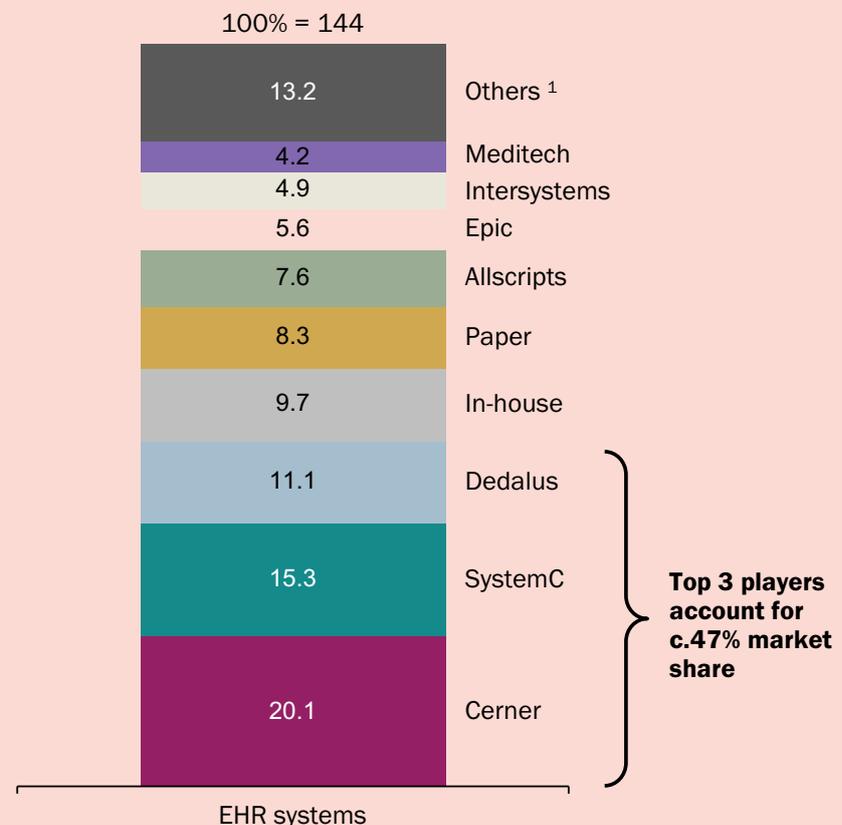
'One third (32%) believe that they

FIGURE THREE
CANDESIC SURVEY - RESPONDENTS ON HOW IT SUPPORT CAN BE IMPROVED, %

Category	%
Increased IT support hours	42%
...ster IT support response times	21%
...eased IT support effectiveness	13%
Increased training	13%
Online IT support	8%
Reporting issues direct in EHR	4%

FIGURE FOUR
EHR SUPPLIERS TO NHS HOSPITALS, %

100% = 144

Value	Supplier
13.2	Others [1]
4.2	Meditech
4.9	Intersystems
5.6	Epic
7.6	Allscripts
8.3	Paper
9.7	In-house
11.1	Dedalus
15.3	SystemC
20.1	Cerner

Top 3 players account for c.47% market share

EHR systems

rarely have all the necessary IT equipment to perform their job to the best of their abilities without disruption. This includes printers, computers/laptops, monitors, smartphones, tablets, Wi-Fi and broadband (with adequate speed and coverage), and scanners.

'Over a quarter (27%) lose more than four hours a week because of inefficient hardware/systems – if this were the case for one in four doctors working across the NHS, including foundation doctors and speciality trainees, which

WHILE 85% OF RESPONDENTS RECEIVED EHR TRAINING, ONLY 55% RATED THE TRAINING AS GOOD

is currently 156,750 doctors, this would amount to at least 156,750 medical hours lost every week or indeed 8,150,000 a year.

This equates to approximately 4,870 full-time equivalent doctors working 37.5 hours a week over a calendar year (including leave and public holidays).'[2]

To put this into context, as of March 2022, 8,016 NHS secondary care doctor posts were vacant.[7,8]

NOTES

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