Adapt to Survive: Practical Examples for NHS Trusts and Other Healthcare Providers

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About Sustainability West Midlands

SWM was established in 2002 as an independent, not-for-profit company and our mission is to make the West Midlands region more sustainable, fairer and greener for all.

Our vision is that the West Midlands is leading in contributing to the national target of net zero greenhouse gas emissions by 2050 whilst addressing health inequality and driving inclusive growth. We monitor the <u>West Midlands Sustainability 2030 Roadmap</u> which acts as a framework that all organisations based or operating in the region can use to help them make changes to their activities in the knowledge that they will contribute to wider regional ambition.

SWM's support our <u>members</u> and other local stakeholders in the public, private and third sectors to implement these changes by enabling them to demonstrate innovation and leadership and provide opportunities to collaborate and celebrate success.

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Introduction

The purpose of this guide

This compendium provides a compendium of case studies that demonstrate practical actions that NHS Trusts and Integrated Care Systems/Boards (ICSs/ICBs) have taken across England and Scotland that focus, at least in part, on delivering adaptation outcomes. This compendium has been produced by Sustainability West Midlands (SWM) for NHS Trusts and ICSs/ICBs in England. However much of the advice will be applicable to healthcare providers throughout the UK and beyond.

This compendium forms one of a series of resources produced through a collaboration between SWM and the Environment Agency, to support NHS Trusts and other healthcare providers to adapt to climate change. The other resources are an Adaptation Plan Health Services Worksheet and supporting guide titled '<u>Adapt to Survive</u>'. For information on climate change, the risks it poses to public health and health services, and guidance on how to produce a plan for adapting to and preparing for these risks, please refer to these other two resources.

The case studies that are included in this compendium have been led by NHS Trusts from across England and Scotland, demonstrating what is possible when it comes to adapting to climate change and providing NHS Trusts and other health services with ideas and inspiration to carry out adaptation projects themselves. For each one, where available, information provided includes:

- A summary of the project and what it has delivered by way of climate change adaptation outcomes.
- What other areas of sustainability the project has also considered; we favour projects that generate cobenefits and multiple outcomes linking to other agendas (such as net zero and enhancing nature), as well as adaptation.
- Partners the NHS Trust has worked with, how the project was funded and what the project's successes and challenges were.

There are examples of adaptation being carried out throughout the NHS, but evidence of this is often not easily accessible or does not in fact identify itself as adaptation. Where adaptation was not the main intention of some of these case studies, it has been explained how some of the qualities within the project do, in fact, improve resilience to severe weather.

SWM hopes this compendium and the other resources can facilitate the start of a wider open dialogue between Trusts and ICSs around adaptation to help drive forward this essential work.

Climate risks addressed							Other areas of sustainability considered						
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Heavy rain / flooding	Storms	Drought	Extreme heat	Strong winds	Sea level rise	Cold spells	Air quality	Nature	Health	Sust. travel	Energy	Carbon reduction	Sust. Growth

Key to symbols included in the case studies:

Specific adaptation examples

SPONGE2020 adaptation and stakeholder engagement

- NHS Trust lead: Basildon and Thurrock University Hospitals
- Location: Basildon, Essex
- **Partners:** Essex County Council, with assistance from Dutch, British and Flemish local governments and water authorities
- Funded by: Interreg 2 Seas (part financed by ERDF)





Other areas of sustainability considered:



Process

Basildon Hospital had a poorly maintained attenuation pond and under-utilised green spaces which were targeted for a project to upgrade their quality for stakeholders, biodiversity, and adaptation. Staff, patients and visitors were consulted over improvements through a stakeholder engagement event. Their feedback resulted in additional features including cafe tables/chairs, fixed seating for staff, canopy style structures, low maintenance planting, and an emphasis on natural materials. One challenge was creating spaces and using materials safe for all stakeholders, which was ensured by working closely with Facilities Management and resulted in features such as taller fencing around the pond. When planning how to add <u>Sustainable Drainage Systems (SuDS)</u> across the site, location was crucial as space was limited, particularly considering construction could not impact emergency access to the site. To address this, the existing attenuation pond and green spaces were used as efficiently as possible, for example feeding one of the two new drainage channels into the existing pond, requiring less new drainage infrastructure.

Results

The improved attenuation pond, new rain gardens, a surface water drainage channel from the car park and other improvements increased the site's water retention capacity by 2,900m³. This project also helped to reduce water pollution, improved water run-off quality, provided green spaces and habitats to enhance the biodiversity of the local area, and created a more pleasant place for patients and staff to visit.

Partnerships

This project was part of SPONGE, an 'Interreg 2 Seas' programme on engaging local stakeholders in adaptation projects, to produce <u>resources free to use for anyone</u>, including a toolbox for stakeholder engagement around climate adaptation. This was carried out in partnership with Essex County Council and discussions also took place with Anglian Water to consider converting some disused Anglian Water-owned land next to the site into a washland to maximise the volume of water retained on site.

NHS Forest example at Southmead

- NHS Trust Lead: North Bristol NHS Trust
- Location: Southmead Hospital
- Partners: <u>NHS Forest</u> (Centre for Sustainable Healthcare)
- Funding: Various sources

Climate risks addressed:



Other areas of sustainability considered:



Summary

Southmead Hospital has 19 acres of land that has been converted into a range of green spaces with the support of NHS Forest, including a rooftop garden, roadside meadows, an allotment and a range of other green and sustainable features and infrastructure. <u>A map is</u> available to everyone, highlighting all the green spaces and there are information boards across the site, alongside activities for staff and the local community which are held to help make walking and spending time in nature as accessible as possible.

Adaptation techniques and outcomes

Multiple areas of sustainable drainage were created on and off-site, including plant-friendly permeable paving to reduce surface water flooding, and 4,900m² of <u>attenuation ponds</u>, which collect run-off from areas of the site such as the car park and release it in a controlled manner into the local watercourse through a natural filtration system. Trees were also planted along a riverbank near the hospital to help reduce the risk of erosion during periods of rainfall and higher river levels. In areas where plants had been failing due to hotter, drier summers, the team trialled using more drought-tolerant species, so plants can still be used on those areas of the site. They also used the opportunity to raise awareness of the increasing temperatures and how certain plants can still survive in these environments with interpretation boards and leaflets.

Partnerships and other fundraising methods

An NHS Forest Nature Recovery Ranger coordinates this project and its many collaborations. Staff and local community volunteers are encouraged to help manage the green spaces and allotments on an informal basis with no expectations of commitment. Local organisations support the work through donating trees, sponsoring events or funding activities, including the National Trust, the Great Outdoor Gym Company, Plastic Pollution Awareness & Actions Projects, One Tree Per Child, the Woodland Trust, and Ecosia.

Other uses and outcomes

A focus on staff wellbeing can be seen through organised lunchtime walks, wellbeing sessions, the outdoor green gym, and workshops including a chef demonstration using the kitchen garden. There was also an increase in bees, butterflies and birds including goldfinches and wagtails. There has also been a strong focus on patient wellbeing, with the Head Injury Therapy Unit using some of the greenspace as a therapy garden for rehabilitation activities.

An inner-city project with minimal space

- NHS Trust Lead: NHS Scotland
- Location: Gyle Square, Edinburgh
- **Funding:** NHS National Services Scotland, Healthcare Improvement Scotland and NHS Health Scotland, match funding from the Green Exercise Partnership (GEP).

Climate risks addressed:



Other areas of sustainability considered:

Process

NHS offices at Gyle Square in Edinburgh included a small courtyard that was unused. A project was carried out to improve the space by a cross-departmental team including individuals from Senior Management, Strategy and Governance, Finance, Customer Engagement, and the Healthy Working Lives and the Building User Group.

Staff were consulted through short surveys about the courtyard which showed the space was unappealing, difficult to access and rarely used. A business case was developed which included a <u>Place Standard</u> <u>Assessment</u> which is a free resource to help identify the ways a space could better benefit the people using it and tackle health inequalities.

Adaptation techniques and outcomes

The business case was approved and the resulting upgrade included a new accessible path linking either side of the courtyard, large planters around the perimeter with a variety of native trees and shrubs, a wildflower meadow to add colour and increase biodiversity value, a grassed area for staff to sit in warmer weather, benches, and a large raised deck area with additional seating.

There was a reported improved courtyard microclimate and better rainwater management. Previously, it was likely that the courtyard retained a lot of heat due to the predominant presence of concrete, making it uncomfortable to be in and increasing the surrounding temperature. A courtyard can also exacerbate high winds if there is no greenery to buffer them. The courtyard was subsequently used more often by patients and staff, demonstrating that improving the quality of even a small space can generate many benefits. The contract was awarded to a local unnamed social enterprise, which itself benefits to the local economy.

Adaptation Assessments and Planning

Carrying out a Climate Change Risk Assessment

- NHS Trust Lead: NHS Lanarkshire
- Location: Lanarkshire, Scotland
- Partners: Adaptation Scotland



Context

Severe winter weather caused disruption to NHS Lanarkshire's sites a few years ago, preventing staff and supplies getting to them safely. This resulted in a decision to carry out site-based risk assessments to better understand the Trust's vulnerability and put a process in place to record the frequency of events and, where possible, the costs that NHS Lanarkshire incurs as a result to build up a database of climate impacts.



4x4 driving on snowy roads, surrounded by forest, during a blizzard.

Adaptation and Outcomes

Using the risk assessments and database, these sites can now draw on this information to understand their vulnerabilities to future climate change, inform climate ready decisions and planning, and justify investment in adaptation actions.

Examples of actions that have come out of this project include investing in electric/hybrid fourwheel drive vehicles to ensure sites can receive deliveries and have specimens uplifted, and providing emergency planning and response training for staff.

Scoping out opportunities for adaptation on an existing site

- NHS Trust Lead: NHS Greater Glasgow & Clyde
- Location: Queen Elizabeth University Hospital Scotland
- **Partners:** Sustainability Action, NHS Scotland, ERZ Landscape Architecture Studio, Green Exercise Partnership

Climate risks addressed:



Other areas of sustainability considered:

Context

NHS Greater Glasgow & Clyde's Head of Sustainability commissioned a landscape opportunities study to be carried out by the Landscape Architect's ERZ, published in 2021. The purpose of the study was to look at the existing land around the hospital and the surrounding community to identify potential sustainability-related projects that could improve climate resilience, biodiversity, active travel, human comfort, outdoor clinical spaces and integrated green infrastructure. Many of these projects also include details on the benefits to biodiversity, wellbeing, and potential cost savings through more efficient land management.

Adaptation techniques and outcomes

Analysis that was carried out included simple actions such as identifying localised wet areas where water built up after rain and areas that were particularly affected by windy days.

Quick wins were identified including offering tree-planting as a volunteering opportunity, improving drainage maintenance and planting small shelter belts with mixes of trees and shrubs to prevent high winds causing danger to people or buildings.

Longer-term, an updated attenuation tank was suggested with more nature-based solutions surrounding it to improve its efficacy and safety. It was demonstrated how existing water management systems could support green infrastructure around them, which in turn would support surface water drainage and reduce the demand on these systems by slowing run-off during heavy rain. Despite the site being small, converting grass patches into 'pocket' parks and gardens was recommended, highlighting that "making no change is not free, with amenity grass one of the most labour intensive and expensive ground coverings to maintain." The car parks on site required repairs, so there was a clear opportunity to address issues of potential surface water flooding. They were recognised as areas with little to no spare land for attenuation tanks or ponds, so instead <u>permeable paving</u> and surface water infiltration using wet woodlands, <u>rain gardens</u> and <u>swales</u> was recommended, helping hold, filter and slowly release water into the ground.

Other activities and how they can relate to adaptation

NHS Forest examples of Nature Based Solutions

- NHS Trust Leads: Multiple
- Location: Multiple
- Partners: NHS Forest: Centre for Sustainable Healthcare
- Funding: NHS Forest: Centre for Sustainable Healthcare



Context

NHS Forest is an alliance of NHS sites that use green spaces to improve health and wellbeing, biodiversity, and encouraging engagement in nature. Run by the <u>Centre for Sustainable Healthcare</u>, the alliance provides support to healthcare sites across the UK that register with them, including providing the resources needed to plant trees, meadows, allotments, blue spaces and more. Support comes in many forms, from free trees to guidance and advice on how to 'green' your own sites, to establishing a dedicated Nature Recovery Ranger.

Working with NHS Forest provides opportunities to strengthen resilience to climate change. Some of the examples given above demonstrate that by improving green and blue infrastructure, this can often lead to (e.g.) flood alleviation, reducing the temperature of an area, to slowing down wind speeds. Other examples of NHS Forest projects that may in part enhance climate change adaptation action are below.

Examples

<u>Royal Stoke University Hospital</u> (University Hospital of North Staffordshire NHS Trust): Planted over 12,000 trees, which is an effective method of adaptation, reducing overall temperatures in an area and increasing shading. Tree planting and green space creation happened alongside the development of new buildings, so is an example of incorporating the nature-based solutions into new building plans.

<u>University Hospital Coventry</u> (University Hospitals Coventry and Warwickshire NHS Trust): Planted over 3,000 trees and created a natural Surface Water Drainage System as part of a swales wetland area.

<u>Acute District General Hospital</u>, East Anglia (James Paget University Hospitals NHS Foundation Trust): This site has courtyard gardens, a protected forested area, and a green boundary line encircling the hospital, with particular significance in protecting the buildings and patients from the impact of high winds, heavy rain and storm surges as a <u>seafront site</u>.

Retrofitting Birmingham's Women's and Children's Hospital

- **NHS Trust lead:** Birmingham Women's and Children's Foundation Trust
- Location: Birmingham
- Funded by: Public Sector Decarbonisation Scheme

Climate risks addressed:



Other areas of sustainability considered:



Context

Birmingham Women's and Children's Foundation Trust are in the midst of carrying out a £70 million three-year project, £63 million of which was grant funded by the Public Sector Decarbonisation Scheme (PSDS). This project is focusing decarbonising heat for the hospitals, resulting in a reduction of building energy demand and carbon footprint from buildings, which initially accounted for 17% of the Trust's total footprint.

Adaptation techniques and outcomes

Plans included installing ground source heat pumps and building upgrades including changing to more efficient lighting, windows and insulation. Before the project, it was too hot in the summer and too cold in the winter, resulting in a poor patient experience and slower recovery as well as a suboptimal working environment for staff. Some operations were cancelled because theatres were not at a comfortable temperature. As a result of the project, the infrastructure will be significantly more energy efficient and regulate temperature more effectively, creating a comfortable space for staff and patients and benefit other aspects including improving the shelf life of medications.

Funding

PSDS provides grants for public sector bodies to fund heat decarbonisation and energy efficiency measures. Dialogue takes place between the funders and public sector body, meaning that bids can be refined over a number of stages. Although PSDS mostly focuses on decarbonisation, it is recommended that Trusts consider how overheating risk and thermal comfort can be integrated into PSDS-funded building works wherever possible. <u>Birmingham Women's and Children's Trust</u> are happy to share their experience and advice on this project (please email <u>daniel.saxton1@nhs.net</u>).

Other outcomes

Other improvements included improving the air quality for the wider community and significant reduction in greenhouse gas emissions, predicted at 8,000 tonnes CO₂ per year.

London Hospital Retrofitting Project

- NHS Trust Lead: Barts Health NHS Trust
- Location: Newham University Hospital, London

Climate risks addressed:



Other areas of sustainability considered:

Adaptation techniques and outcomes

The Barts Health NHS Trust includes Newham University Hospital, a 379-bed hospital in east London which carried out a large retrofitting project starting in 2011. Simple upgrades such as replacing old Victorian windows with double glazing eliminated heat loss and reduced energy consumption, which also improves the environment within the buildings, preventing overheating and negative impacts from severe weather occurring. A combined cooling, heat and power (CCHP) plant which generates onsite energy was also installed, increasing the site's energy resilience so it is not solely dependent on one source of energy in case of disruptions and power cuts.

Although not directly focusing on climate change adaptation, making the buildings more energy efficient undoubtedly created a more comfortable environment within the buildings, keeping warmer in the winter and cooler in the summer, preventing the need for active cooling measures and reducing the likelihood that high temperatures would have a negative impact on people or services. This can be used as a demonstration of how carbon reduction and energy savings can also be considered as adaptation and how, when carrying out adaptation planning, there are alternative ways to fund this through existing or new decarbonisation/energy efficiency projects.

The Trust also shares best practice on sustainability through a network called the <u>Green@bartshealth</u> network and lays out its commitment to adaptation in their <u>Green Plan</u>.

Other uses and outcomes

For an initial capital investment of £440,000, Newham University Hospital achieved a 9.4 per cent reduction in CO₂ emissions and a 9.8 per cent reduction in energy costs. The reduction of 732 tonnes of CO₂ also reduced their Carbon Reduction Commitment liability by £9,000 a year, giving a combined total saving of £77,000 a year. The hospital's approach also gained recognition at the <u>Building Better Healthcare Awards</u> as one of the best examples of healthcare building design and won them an international <u>Green Apple Award</u> for environmental best practice.

Improving ward conditions whilst installing solar PV

- **NHS Trust Lead:** Milton Keynes University Hospital NHS Foundation Trust
- Location: Milton Keynes University Hospital

Climate risks addressed:



Other areas of sustainability considered:

Summary

Milton Keynes University Hospital took advantage of a solar panel installation project to simultaneously install new roofing and roof insulation totalling £2.75 million. One ward in particular had to be moved for four weeks due to the works, although the Trust also used this to their advantage by carrying out further refurbishments including installing new LED lighting. New building projects at the hospital now include a fully electric heat network, reducing reliance on gas and the main grid.

Benefits and relation to adaptation

Before this project, the site's roofing was old (coming to the end of its manufacture life), energy inefficient, and had leaks through which water often seeped into the hospital. Staff and patients often reported being uncomfortable, with areas experiencing severe fluctuations in temperature, being too hot on some days and too cold on others. This low energy efficiency also resulted in costs and emissions being unnecessarily high, and staff and patients were reported as being uncomfortable. The upgrades were reported to make an incredibly positive difference to the comfort and health of staff and patients as a result of a significantly reduced fluctuation temperature range.

In addition, renewable, self-produced energy is often more resilient. Where essential or energy intensive equipment is powered by solar, if severe weather or other issues meant connection to the main grid was lost, activities including MRI scans and surgeries in air controlled/ventilated rooms could continue.

As of August 2021, 2,586 solar panels had been installed saving at least 181 tonnes of CO₂ in that year. The total project includes at least 900 more panels, overall meeting around 15% of the Trust's total electricity requirement and saving at least £225,000 a year in energy bills, based on August 2021 electricity prices.

Collaboration to fund multiple sustainable projects

- NHS Trust Lead: University Hospitals of North Midlands NHS Trust
- Location: Royal Stoke University Hospital and County Hospital Stafford
- Partners: <u>Staffordshire Community Energy</u> (SCE), <u>Beat the</u> <u>Cold, Ethex</u>
- **Funding:** Community investment and the Feed-in-Tariff scheme



Summary

University Hospitals of North Midlands NHS Trust has leased their roof space to Staffordshire Community Energy (SCE), who raised £335,600 of investment to fund the installation of 1,089 solar panels across two sites. The hospital purchases back the electricity generated, using extra income from any energy they do not use through a <u>Feed in Tariff</u> to pay back investors (over 20 years at 4.5% IRR) and provide funds for charity Beat the Cold.

Beat the Cold employs specialists who support vulnerable people to make simple, low-cost and longer-term interventions to ensure their homes are safer and warmer, such as fuel vouchers, energy and behaviour change advice, and checking eligibility for grants for improvements such as new boilers and insulation. This partnership means that the Trust can refer patients who have been admitted to hospital for issues that they believe may be attributable to cold, damp, or unsafe conditions in their homes, reducing the number of return patients and improving the health and wellbeing of the community they cover.

Benefits and relation to adaptation

The solar panels reduce emissions, but also improve the Trusts' energy security by removing reliance on the grid. The project not only helps communities live healthier lives through improving comfort in their homes, but by doing this they are also preventing health issues and injuries that were resulting in admission to the hospital in the first place, in particular for vulnerable groups in the population who are more likely to have unsafe or unfit living conditions. The Trust has seen a reduction in hospital admissions, taking pressure off of their services as a result. The interventions and behaviour changes are predicted to save the Trust £800,000 over 20 years from the inception of the project.

Using drones to transport medicine to hard-to-reach areas

- NHS Trust Lead: Isle of Wight NHS Trust
- Location: Isle of Wight
- **Partners:** University of Southampton, Solent Transport, and Apian (medical drone company)

Climate risks addressed:



Other areas of sustainability considered:



Patients on the Isle of Wight requiring chemotherapy are often dependent on mainland providers for medication. Often medication is transported from Portsmouth Hospitals University NHS Trust to St Mary's Hospital in Newport, taking up to four hours with multiple transport handovers. Due to the short shelf life of some chemotherapy, administering the medication has to be made as close to treatment as possible, but due to the distant travelled with the medication it has to be manufactured before the patient has been confirmed as ready for treatment, which can result in the treatment being wasted.

Process

Research was carried out in partnership with a cross-industry team into the feasibility of flying drones between mainland England and the Isle of Wight. The impact on the medication from aspects such as vibrations and temperature during transit were measured to ensure this was a feasible activity.

Adaptation techniques and outcomes

Having drones and lightweight aircraft available for transporting medicine to hard-to-reach areas could be an effective method of adaptation as it may open the door to transportation to areas that are otherwise inaccessible due to severe weather impacts such snow or floods.

In this example, the drone trip replaces at least two car journeys and a ferry and requires no handovers, meaning it is less likely to face interruptions and disruptions from aspects such as moving across different modes of transport, or delays caused by a multitude of factors impacting any or all of the other transport methods.

Partnerships

The Isle of Wight NHS Trust worked with the University of Southampton, Solent Transport and a medical drone company called Apian in a research exercise finding the potential benefits to healthcare by using drones for transporting urgent clinical items. Coordination was also required from the civil aviation authority who had to grant permission for flights.

Other uses and benefits

Cutting the trip time from four hours to 30 minutes helped minimise wastage and treatment delays, freeing up staff time that can be used for direct patient care instead. The dramatic reduction in transport has also reduced the carbon footprint of the process.

Recommendations for NHS Trusts

These case studies give an overview of what climate change adaptation looks like and how NHS Trusts can be leaders in the field of adaptation activity despite minimal resources. We recognise that this list is unlikely to be exhaustive and that there will be many other excellent examples of adaptation happening in Trusts across England and beyond. If you are from an NHS Trust covering England, please send your examples to <u>enquiries@swm.org.uk</u> and we can keep track of other good practice. In the meantime, if your Trust or ICS/ICB is interested in accelerating its climate adaptation activity, but you are unsure where to start, these following recommendations may be helpful.

- Lay the groundwork: First, conduct a risk assessment for your Trust and, following this, develop an adaptation plan. <u>Our new Worksheet</u> will help you to do both of these. These resources will allow you to identify the most urgent areas to address and to prioritise where that resource goes.
- **Gain support and knowledge:** Engage with key partners including NHS England, Greener NHS, Defra, the Environment Agency and SWM, who can provide guidance and support.
- **Partner with local organisations:** An increasing number of local authorities are in the process of developing climate change adaptation plans for their areas, and it is likely to be prudent to engage with them to ascertain what they are doing and whether health aspects are covered in their plan. This will ensure alignment, and it will also be in their interests to help you develop your own plan too. This may also open the door to engagement with other key partners across the area, such as the fire service or university, who you may also be able to work with to ensure the plan is as effective and collaborative as possible.
- Integrate with other priorities: As indicated by the 'other areas of sustainability considered' box in the case studies, the vast majority of projects included in this publication have been activated not just with climate change adaptation in mind, but hand-in-hand with other priorities too, such as upgrading building quality, improving nature and reducing carbon emissions. Adaptation activity can be integrated into activities that would be happening anyway, even if their primary objective is *not* climate change adaptation.
- **Identify the quick wins:** We understand that resourcing adaptation activity is a challenge in the absence of national legislation. However, included in the case study projects are examples that do not require significant resourcing. Trusts should prioritise similar activities for implementation first.
- **Identify your funding options:** Some of the examples in this project are made possible by European funding such as the European Regional Development Fund and Interreg, which the UK now no longer has access to following Brexit. SWM and partners have carried out some research on other options, and some of the case studies here are funded via other public and private funds. This, along with engagement with partners above, is a good place to start in identifying options.
- **Borrow and apply ideas:** You may read the case studies enclosed in this publication and believe that replicating something similar in your area would be a perfect fit. There is no shame in taking inspiration from an idea that has worked well elsewhere; in fact, we would commend this approach as it could help to save resources and time.

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