Broader personal, social and economic impacts

Impact is a change with a stakeholder

An impact response should identify who experiences a change, how the solution causes it and why it matters.

Perspective	Focus	Possible example
Personal	An individual's privacy, autonomy, safety, access, time or opportunity	A false record prevents one person receiving a service
Social	Groups, relationships, participation, fairness, trust and community practices	Digital-only access excludes people without reliable connectivity
Economic	Costs, income, jobs, productivity, competition and distribution of resources	Automation reduces processing cost but changes staff roles

> **Categories overlap:** one data breach may personally expose identity, socially reduce trust and economically create recovery costs.

Classify without oversimplifying

A route app reduces commuting time, but its live-location requirement prevents people with limited mobile data from participating. **Determine** one personal, social and economic impact.

View a sample solution

- Personal: participating commuters save time.
- Social: a connectivity requirement may widen unequal access.
- Economic: time savings may improve productivity, while mobile-data use shifts a cost to users.

Map stakeholders before judging

Stakeholders may experience different outcomes.

- Primary users and people represented in the data
- Staff who operate, review or maintain the solution
- The organisation and service partners
- People indirectly affected by automated or data-informed decisions
- Communities, governments and future users

Ask who gains, who carries cost or risk, who has decision power and who may be missing from the design process.

Stakeholder contrast

A council replaces staffed booking counters with an app. **Analyse** one benefit and one cost for two different stakeholders.

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The council may reduce routine processing cost and gain consistent records, but must fund development, security and support. Confident app users may book at any time, while people without suitable devices, connectivity or digital confidence may lose practical access unless an alternative channel remains.

Data exchange changes reach and risk

Exchanging data can remove duplicated entry, speed coordination and enable new services. It can also spread inaccurate or sensitive information beyond its original setting.

- **Benefit:** emergency teams receive timely, consistent status data.
- **Risk:** more systems and recipients increase exposure and dependence.
- **Question:** Is each field necessary for the receiving purpose?
- **Control:** minimise fields, authenticate parties, encrypt transmission and document responsibilities.

Interoperability can create public value, but an exchange should not be assumed ethical merely because it is technically possible.

Storage creates long-term consequences

Stored data can support history, accountability, personalisation and research. Retention also extends the time during which data may be misused, breached, misunderstood or applied to a new purpose.

Decision	Impact question
What is stored?	Does each field have a defined need, especially sensitive data?
How long?	What benefit requires retention, and when is disposal appropriate?
Who can access it?	Are permissions necessary, attributable and reviewed?
Where?	Which provider, location, contract and legal obligations apply?

Accuracy affects decisions

Data can be syntactically valid but inaccurate, incomplete, outdated or misleading. When a system scales, one error can be copied into many decisions.

Consider:

- who can correct a record
- whether source and update time are visible
- how conflicting values are resolved
- whether uncertainty is communicated
- what happens before a high-consequence decision.

> **Automation can amplify, not remove, error:** consistent processing of inaccurate input produces consistent but still harmful output.

Trace an accuracy impact

A relief database incorrectly records that a household has received supplies. The automated system blocks a second request.

Explain a personal, social and economic consequence.

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Personally, the household may miss essential supplies. Socially, repeated unexplained errors can reduce community trust and affect already vulnerable groups unevenly. Economically, staff spend time investigating and correcting the record while emergency resources may be allocated inefficiently.

Ownership, control and responsibility

“Who owns the data?” may hide several different questions:

- Who is the information about?
- Who collected, created or inferred it?
- Who controls storage, access and disclosure?
- Who holds intellectual-property or contractual rights?
- Who is accountable for accuracy, security and correction?
- Can a person access, move, correct or delete it in the circumstances?

A platform possessing a copy does not mean it can ethically use that data for any purpose. Analyse legal obligations, notices, expectations, contracts and power relationships separately.

Access and the digital divide

Digital solutions can extend services across distance and time. They can also exclude through:

- device and data cost
- unreliable connectivity
- language and literacy barriers
- disability access barriers
- limited digital confidence
- identity-document or authentication requirements.

Providing an app is not the same as providing equitable access. Alternatives, assisted channels and accessible design may be required.

Recommend inclusion

A health appointment system moves to smartphone-only booking with mandatory biometric authentication. **Recommend** two inclusion refinements.

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Keep an assisted phone or in-person channel, and provide a secure non-biometric authentication alternative. These refinements support people without suitable devices, connectivity or usable biometrics while retaining access controls.

Work, cost and productivity

Automation may reduce repetitive work, increase consistency and allow a service to scale. Economic impacts can also include:

- development, infrastructure, energy, licensing and security costs
- training, role redesign or displacement
- new specialist and support work

- dependence on a provider or proprietary format
- costs of outages, errors and breaches
- unequal benefits between organisations and communities.

A serious evaluation avoids “technology creates jobs” versus “technology removes jobs”. Identify which tasks change, what new capabilities are required and who bears transition costs.

Environmental impacts

Digital services use devices, networks, data centres and storage. Impacts include energy use, cooling, hardware manufacture, electronic waste and replacement cycles.

Possible refinements include efficient data retention, appropriately sized models and media, renewable-energy procurement, repairable devices and avoiding unnecessary computation. An environmental claim should use evidence rather than assume that paperless always means impact-free.

Evaluate rather than list

> **Stakeholder:** who is affected? **Mechanism:** what feature or data practice causes change? **Impact:** what benefit or harm occurs? **Extent:** under which conditions and for whom? **Judgment:** how significant or acceptable is it? **Response:** what refinement changes the balance?

> **Weak:** The app has positive and negative impacts.

Evaluated: Real-time availability reduces wasted travel for connected users, but smartphone-only access excludes residents without reliable devices or data. The benefit is therefore unevenly distributed. A public kiosk and assisted booking channel would retain efficiency while reducing exclusion.

Independent practice: smart community transport

A regional service proposes an app that predicts demand and changes bus routes each hour. It collects precise passenger location, payment history and accessibility needs. The model was trained mainly on weekday smartphone users. Cash booking and the staffed phone line will close. The provider promises lower operating cost and shorter average waits.

1. **Analyse** two personal, two social and two economic impacts for different stakeholders.
2. **Evaluate** whether shorter average waiting time is enough to establish success.
3. **Recommend** four refinements covering data, access, model evaluation and accountability.

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- **Personal:** some passengers wait less; location, payment and accessibility data create privacy consequences.
- **Social:** adaptive routes may improve regional participation, but training and smartphone-only access may reduce service for older people, weekend travellers or people without devices.
- **Economic:** the provider may reduce fuel and scheduling costs; passengers excluded from routes may face higher travel costs or reduced employment access, while staff roles change.
- **Evaluation:** an average can hide very long waits for smaller groups and does not test access, privacy, reliability or route coverage.
- **Refinements:** minimise and set retention for precise data; keep phone, cash or assisted access; test waiting time and missed-service rates by region, time and relevant user group; publish decision rules and provide human review and complaint mechanisms.

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