Visualizing Tally Sticks: Transparency in Action

The Goal: Trustworthy Government Spending

Tally Sticks aims to bring unprecedented transparency and accountability to how public funds (like taxes) are allocated and spent. It replaces opaque processes with a clear, verifiable digital record, inspired by the historical tally stick system used for centuries to prevent fraud. At its core is the **Ethically-Aware Validation Engine**, ensuring every step aligns with constitutional principles.

What is a Digital Tally Stick? (The "Government Pot")

Instead of one giant ledger, Tally Sticks uses individual "digital tally sticks" for each specific fund, grant, or budget allocation. Think of it like this:

- **Physical Tally Stick:** Represented a *single* debt or agreement between two parties. Notches marked transactions. Splitting it created two identical, tamper-proof records (stock and foil).
- **Digital Tally Stick:** Represents a *single pot* of public money (e.g., Derby City Council's road repair budget for 2024).
 - **The Stick:** A unique digital record (TallyStick in the database) defining the pot's purpose, total amount, funder, recipient, and status.
 - **The Notches:** Digital Transaction records linked to that specific Tally Stick, detailing each allocation or disbursement (amount, payee, purpose, timestamp, authorizing officer).
 - Stock & Foil (Analogy): The "split" is achieved through cryptography and potentially blockchain anchoring. Signatures ensure authenticity, and the shared (permissioned) ledger ensures multiple parties see the same verified record, making tampering detectable.

The Lifecycle of a Tally Stick (Example: Road Repair Fund)

This shows the journey of public money within the Tally Sticks system, governed by the Validation Engine at key points.

sequenceDiagram participant Treasury participant Council as Derby City Council (Recipient) participant Engine as Ethically-Aware Validation Engine participant Ledger as Tally Sticks Ledger (Database + Blockchain Anchor) participant Contractor participant Public

Treasury->>+Council: 1. Allocate Funds (£1M for Road Repairs) - Create Tally Stick

(Draft)

Council->>+Engine: 2. Submit Tally Stick for Activation (Requires Signatures) Engine->>Engine: 3. Validate Creation (Principles: Fiscal Accountability,

Transparency, etc.)

alt Validation Fails

Engine-->>Council: Rejection (Reason: e.g., Missing Basis)

else Validation Passes

Engine->>+Ledger: 4. Record Activated Tally Stick (Status: ACTIVE) Ledger-->>-Engine: Confirmation

Engine-->>-Council: Activation Confirmed

Council->>+Contractor: 5. Issue Work Order (e.g., Repair Main St)

Contractor->>+Council: 6. Submit Invoice (£50k for Main St Repair)

Council->>+Engine: 7. Request Disbursement from Tally Stick #123

Engine->>Engine: 8. Validate Disbursement (Principles: Accountability, Purpose Alignment, Funds Check, etc.)

alt Validation Fails

Engine-->>Council: Rejection (Reason: e.g., Exceeds Balance)

else Validation Passes

Engine->>+Ledger: 9. Record Disbursement "Notch" (Link to Invoice Hash, Signatures)

Ledger-->>-Engine: Confirmation (Balance Updated)

Engine-->>-Council: Disbursement Approved (Funds Released via separate payment system)

Council-->>-Contractor: Payment Issued

end

end

Public->>Ledger: 10. View Tally Stick #123 (Purpose, Balance, Transactions - "Why?")

Explanation:

- 1. Allocation: Treasury allocates funds, creating a *draft* digital Tally Stick record.
- 2. Activation Request: The Council submits the draft stick, likely after internal approvals/signatures.
- 3. **Engine Validates Creation:** The Ethically-Aware Validation Engine checks if the Tally Stick's creation complies with constitutional principles (Is the purpose clear? Is the amount reasonable? Is the constitutional basis valid?).
- 4. Recording: If valid, the Tally Stick is marked "ACTIVE" and recorded on the secure

ledger.

- 5. Work Order: The Council proceeds with the work.
- 6. Invoice: The Contractor submits an invoice for completed work.
- 7. **Disbursement Request:** The Council requests to pay the invoice *from* the specific Tally Stick fund.
- 8. **Engine Validates Disbursement:** The Engine checks again: Are funds available? Is this spending aligned with the Tally Stick's purpose? Are the necessary approvals/signatures attached? Does it meet transparency and accountability rules?
- 9. **Recording "Notch":** If valid, the disbursement is recorded as a transaction ("notch") linked to the Tally Stick on the ledger, updating the balance.
- 10. **Public View:** Citizens can view the Tally Stick's details, its transaction history, and the validation status ("Why?") for each step (subject to appropriate access levels).

Public Transparency Portal (Conceptual Mockup)

Imagine a public website where taxpayers can explore this data:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Tally Sticks - Public Spending Explorer</title>
  <script src="https://unpkg.com/@tailwindcss/browser@4"></script>
  k rel="preconnect" href="https://fonts.googleapis.com">
  k rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
  <link
href="https://fonts.googleapis.com/css2?family=Inter:wght@400;500;600;700&displa
y=swap" rel="stylesheet">
  <style>
    body { font-family: 'Inter', sans-serif; }
    .status-active { background-color: #dcfce7; color: #166534; }
    .status-pending { background-color: #fef9c3; color: #854d0e; }
    .status-closed { background-color: #f3f4f6; color: #4b5563; }
    .validation-passed { color: #16a34a; }
    .validation-failed { color: #dc2626; }
    .validation-warning { color: #f59eOb; }
    /* Basic Accordion */
```

.accordion-content { max-height: 0; overflow: hidden; transition: max-height 0.3s ease-out; }

.accordion-button.active + .accordion-content { max-height: 500px; /* Adjust as needed */ }

</style>

</head>

<body class="bg-gray-100 p-4 md:p-8">

<div class="max-w-4xl mx-auto bg-white p-6 rounded-lg shadow-md">

<h1 class="text-2xl font-bold text-gray-800 mb-6">Tally Sticks: Public Spending Explorer</h1>

<div class="mb-6">

<label for="search" class="block text-sm font-medium text-gray-700
mb-1">Search Funds (Department, Purpose, Postcode, etc.)</label>

<input type="text" id="search" class="w-full p-2 border border-gray-300
rounded-md focus:ring-blue-500 focus:border-blue-500" placeholder="e.g., Derby
Road Repairs, NHS Grant DEF-456...">

</div>

<h2 class="text-lg font-semibold text-gray-700 mb-4">Matching Funds / Tally Sticks</h2>

<div class="space-y-4">

<div class="border border-gray-200 rounded-lg p-4 bg-white hover:shadow-sm transition-shadow">

```
<div class="flex justify-between items-center mb-2">
```

<h3 class="text-md font-semibold text-blue-700">Derby City Council Road Maintenance 2024 (ID: TS-DE2-RM24)</h3>

ad Maintenance 2024 (ID. 13-DE2-RM24)</113>

```
<span class="text-xs font-medium px-2 py-0.5 rounded-full
```

status-active">ACTIVE

</div>

<span

class="font-medium">Purpose: Resurfacing and pothole repairs on major routes within DE2 postcode.

```
<span
class="font-medium">Constitutional Basis:</span> Highways Act 1980, Local Gov
Finance Act
```

```
<div class="flex justify-between text-sm mb-3">
```

Allocated: <strong</pre>

class="font-medium">£1,000,000

```
<span class="text-green-700 font-semibold">Remaining: <strong</pre>
class="font-medium">£950,000</strong></span>
                     </div>
                     <button class="accordion-button w-full text-left text-sm font-medium"</pre>
text-blue-600 hover:text-blue-800 py-2 focus:outline-none">
                          Show Transactions (1) •
                     </button>
                     <div class="accordion-content border-t border-gray-200 pt-3 mt-2">
                          <div class="text-xs p-3 bg-gray-50 rounded mb-2">
                               <strong>Date:</strong> 2025-04-01 | <strong>Amount:</strong>
£50,000 | <strong>Payee:</strong> Acme Roadworks Ltd.
                               <strong>Purpose:</strong> Resurfacing Main St (Phase 1)
                               <strong>Reference:</strong> Invoice #INV-789
                               <div class="mt-1">
                                    <strong>Validation Status:</strong>
                                    <span class="font-medium validation-passed">\/ Passed</span>
                                    <br/>

focus:outline-none" onclick="toggleDetails('details-tx1')">(Why?)</button>
                                    <div id="details-tx1" class="text-xs text-gray-500 mt-1 hidden pl-2</pre>
border-I-2 border-gray-300">
                                          <checked against: TRANSPARENCY, ACCOUNTABILITY,</p>
FISCAL ACCOUNTABILITY, SERVICE OVER POWER
                                          Result: No violations found.
                                          </div>
                               </div>
                          </div>
                           </div>
                </div>
                </div>
     </div>
     <script>
          // Basic Accordion & Details Toggle Logic
          document.guerySelectorAll('.accordion-button').forEach(button => {
                button.addEventListener('click', () => {
                    button.classList.toggle('active');
                    // Simple toggle for next sibling content
                     const content = button.nextElementSibling;
```

```
if (content && content.classList.contains('accordion-content')) {
           if (content.style.maxHeight && content.style.maxHeight !== 'Opx') {
              content.style.maxHeight = 'Opx';
           } else {
              content.style.maxHeight = content.scrollHeight + "px";
           }
         }
      });
    });
    function toggleDetails(id) {
      const detailsDiv = document.getElementById(id);
      if (detailsDiv) {
         detailsDiv.classList.toggle('hidden');
      }
    }
  </script>
</body>
</html>
```

How the Mockup Demonstrates Tangibility:

- **Searchability:** Citizens can actively search for information relevant to them (e.g., by department, location, or project name).
- **Clear Fund Overview:** Each "Tally Stick" provides a high-level summary: its purpose, total allocation, and current remaining balance.
- **Transaction History ("Notches"):** Users can drill down to see the individual transactions (disbursements) made from a specific fund, including the date, amount, payee, and specific purpose.
- Validation Status: A clear status (Passed, Failed, Warning) is shown for each transaction's constitutional validation check.
- **The "Why?" Function:** This is the most crucial element for transparency. Clicking "(Why?)" reveals the detailed output (ValidationResult) from the Ethically-Aware Validation Engine. This shows:
 - Which constitutional principles were checked.
 - Whether the check passed or failed.
 - If it failed, *precisely which rules* were violated (the errors list, including severity, message, principle, details).
 - Any potential issues or recommendations (the warnings list).

• Benefit for Taxpayers: This interface allows taxpayers to see exactly how specific pots of public money are being spent, verify that spending aligns with stated purposes, and understand *why* transactions were approved (or potentially flagged/rejected) based on the codified constitutional principles. It transforms abstract governance into concrete, explorable data, fostering trust and enabling informed accountability.

This combination of process visualization, analogy, and a tangible user interface mockup should make the Tally Sticks system and its core validation engine much more understandable and trustworthy for all stakeholders.

04/04/2025

Version 1.0

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