# ARCHITECTURAL TECHNICAL DEBT IN MICROSERVICES

## A CROSS-COMPANY STUDY

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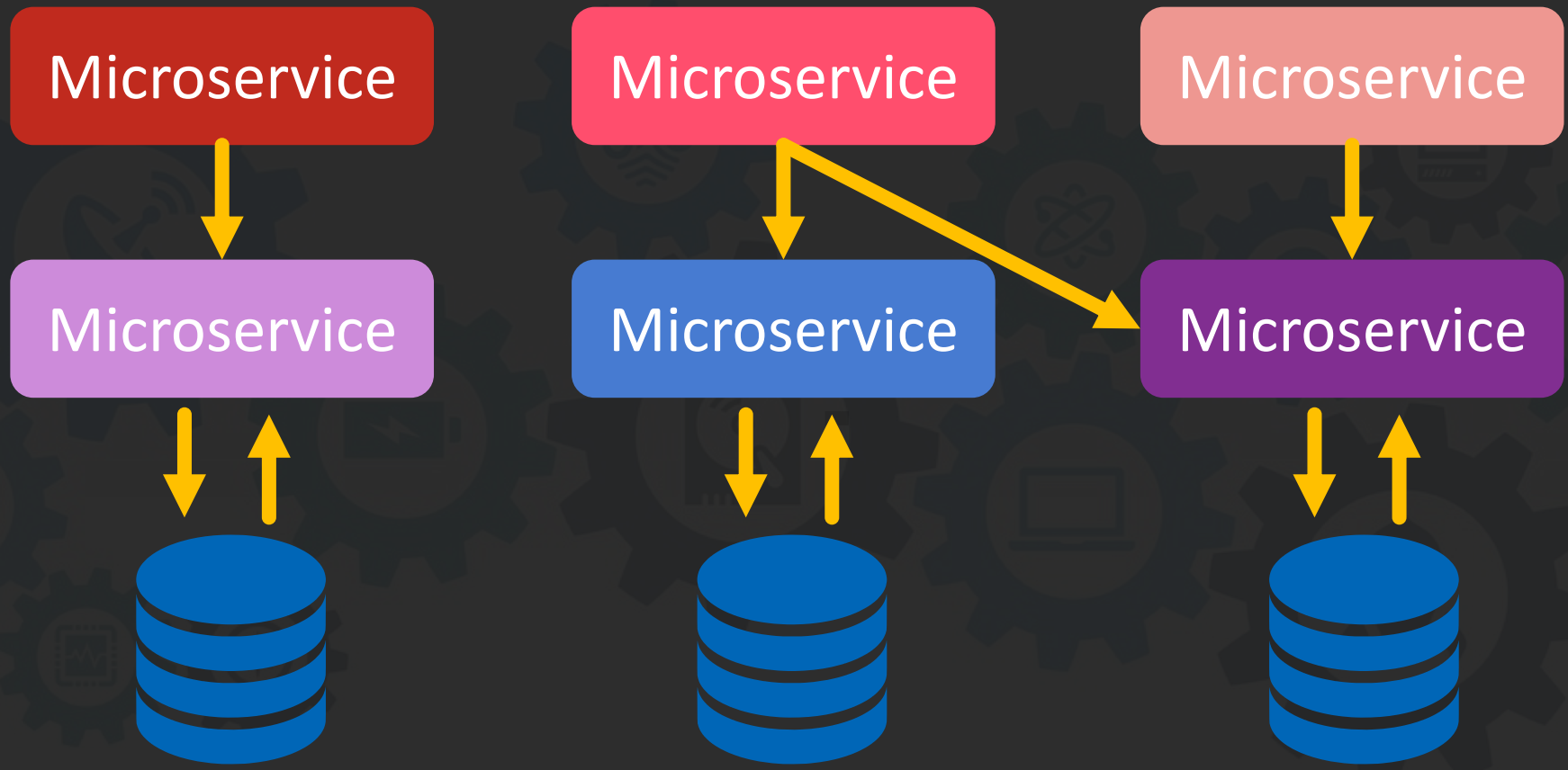
# MICROSERVICES



TECHNICAL
DEBT

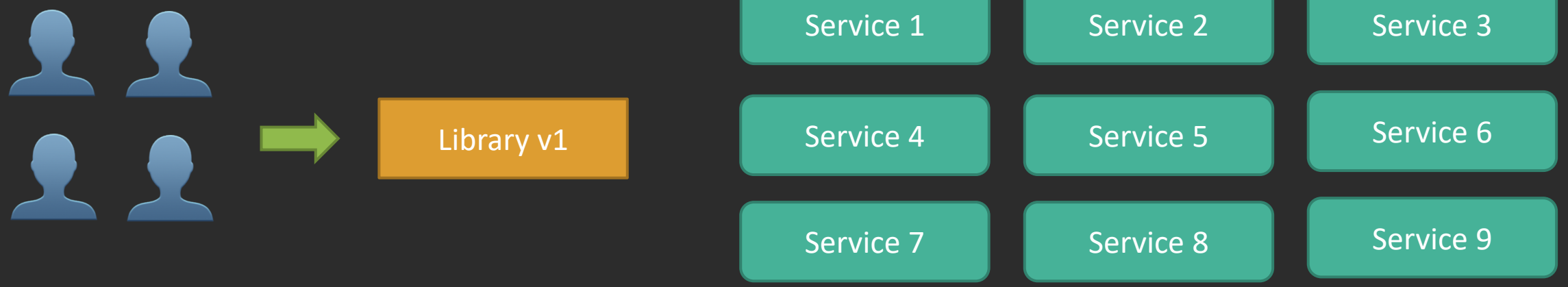
# WE KNOW THAT...

- Microservices is a recent technology
  - Essential for Continuous Delivery
  - Loosely coupled services
  - Independent deployment and teams
- Companies face new challenges regarding microservices architecture
  - No well-known best practices
  - Negative impact of some solutions are not known

# THE STUDY

- We currently investigated 7 cases
  - Different contexts
  - Some TD is the same, some not
- We are sharing issues and solutions
  - Companies may avoid costs of technical debt by knowing:
    - solutions tried by others
    - drawbacks of decisions in advance

# EXAMPLE OF FINDINGS: SHARED LIBRARIES



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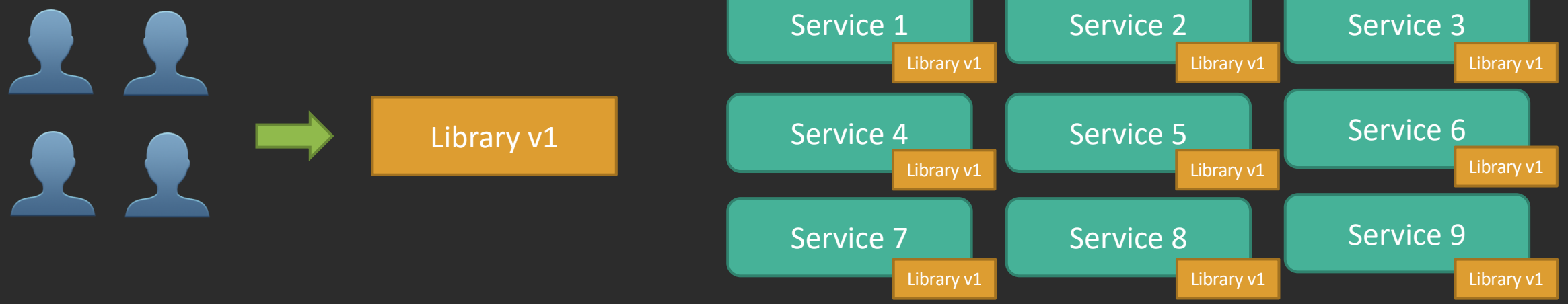

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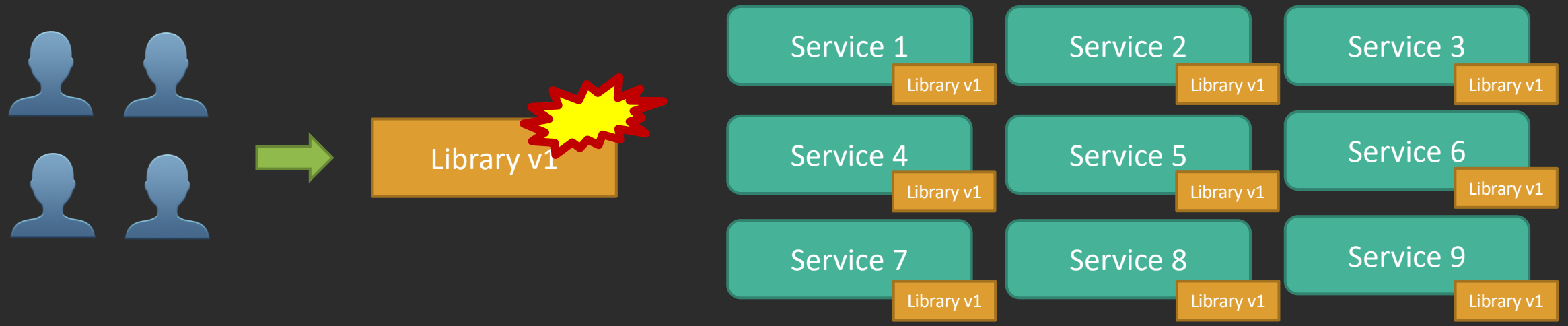

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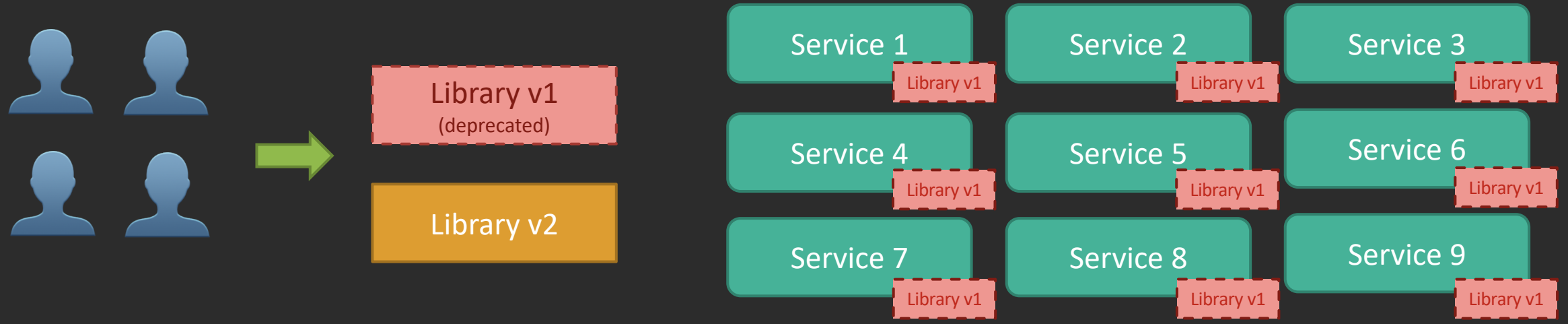

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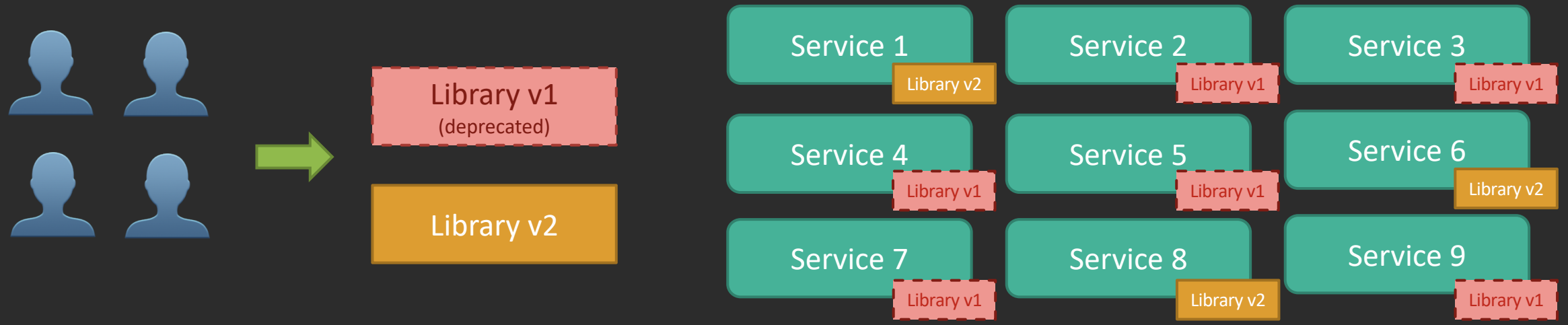

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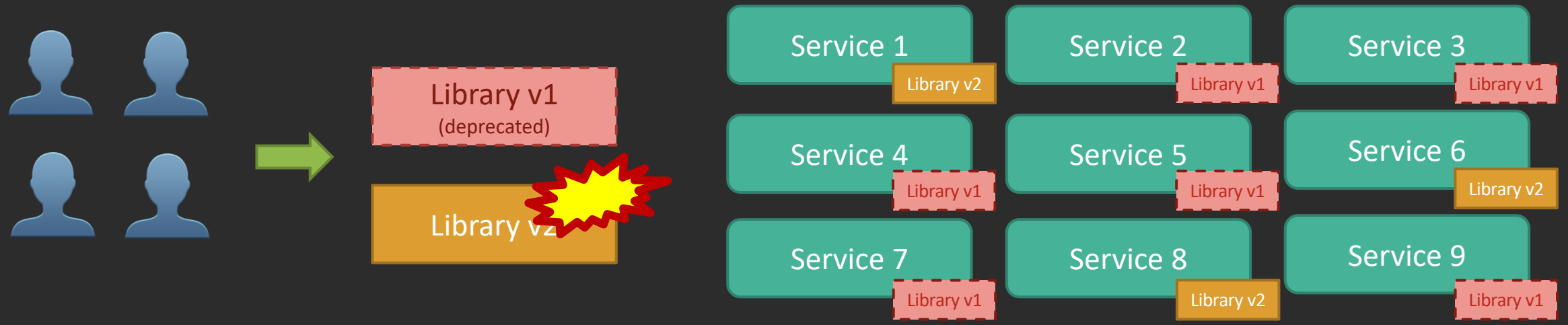

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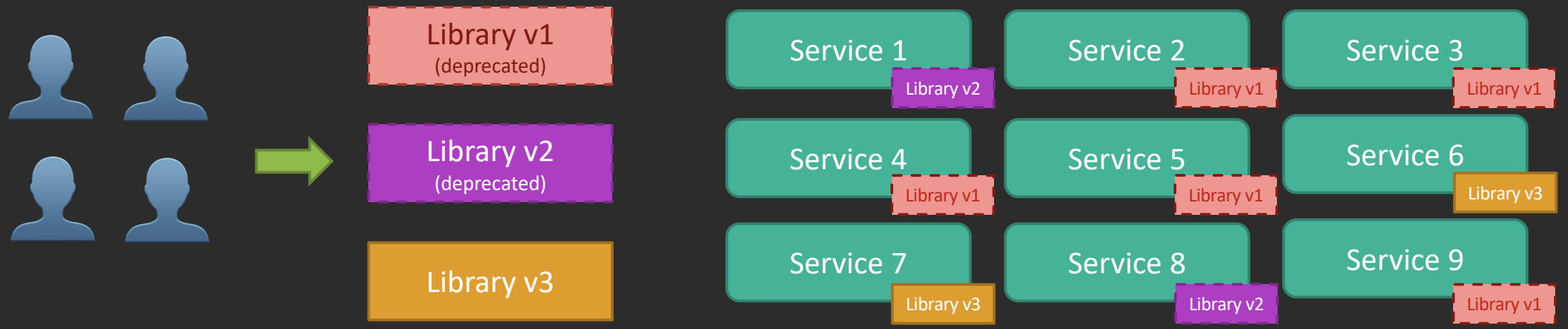
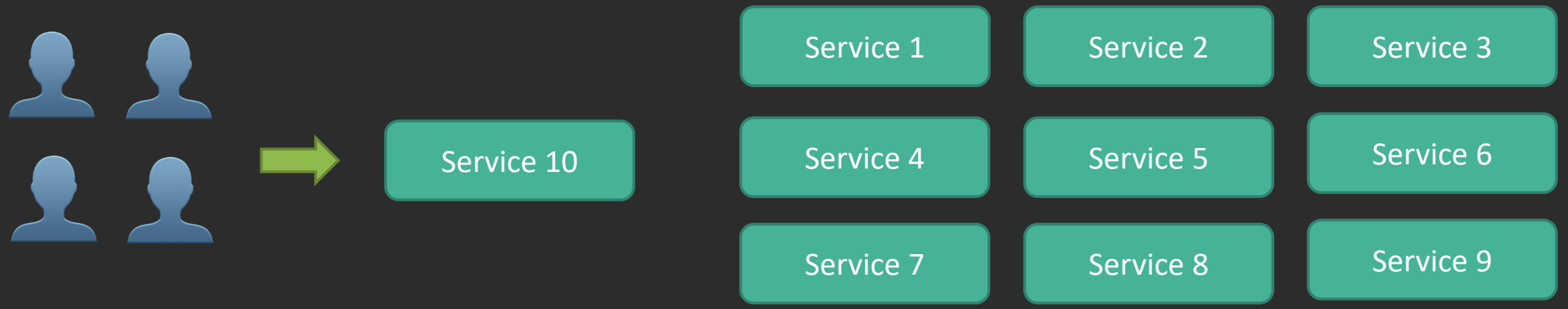


# CONSEQUENCES OF HAVING SHARED LIBRARIES

- New releases of the libraries require updates on every service using them
  - A roadmap mustbe established to handle such changes
  - Early adopters may refuse to move to new versions
- Several versions of the libraries must be maintained until deprecation
- Library use cases are frequently unknown, leading to breaking changes
- Explicit dependency on the library developer team

# WHAT TO DO WITH SHARED LIBRARIES



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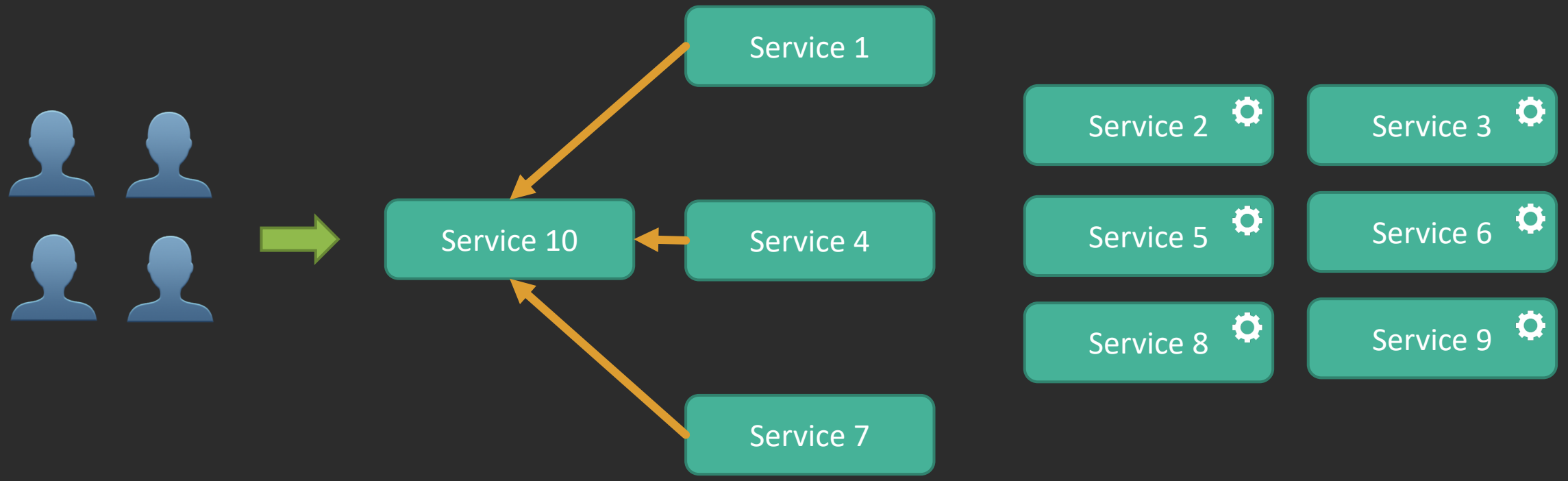

# BENEFITS OF THE SOLUTION

- Small changes can be done by the teams themselves
- Changes in the shared service do not affect the dependent services if its API is not changed

| Debt | Company | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G |
| TD 1 | ✓ | | | | ✓ | | |
| TD 2 | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| TD 3 | | | | | | | |
| TD 4 | | ✓ | ✓ | ✓ | | | |
| TD 5 | ✓ | | ✓ | | | | |
| TD 6 | ✓ | | | | ✓ | ✓ | |
| TD 7 | | ✓ | ✓ | | | | |
| TD 8 | | | ✓ | ✓ | | | |
| TD 9 | ✓ | | | | | | |
| TD 10 | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| TD 11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TD 12 | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| TD 13 | | ✓ | | | ✓ | | |
| TD 14 | | | | | | | ✓ |

# NEXT STEPS

- Additional cases
  - Do you want to participate? Let us know!
- Investigate metrics to measure/quantify debt, principal and interest
  - In-depth case studies

THANK YOU