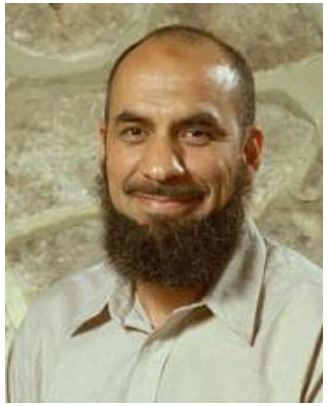
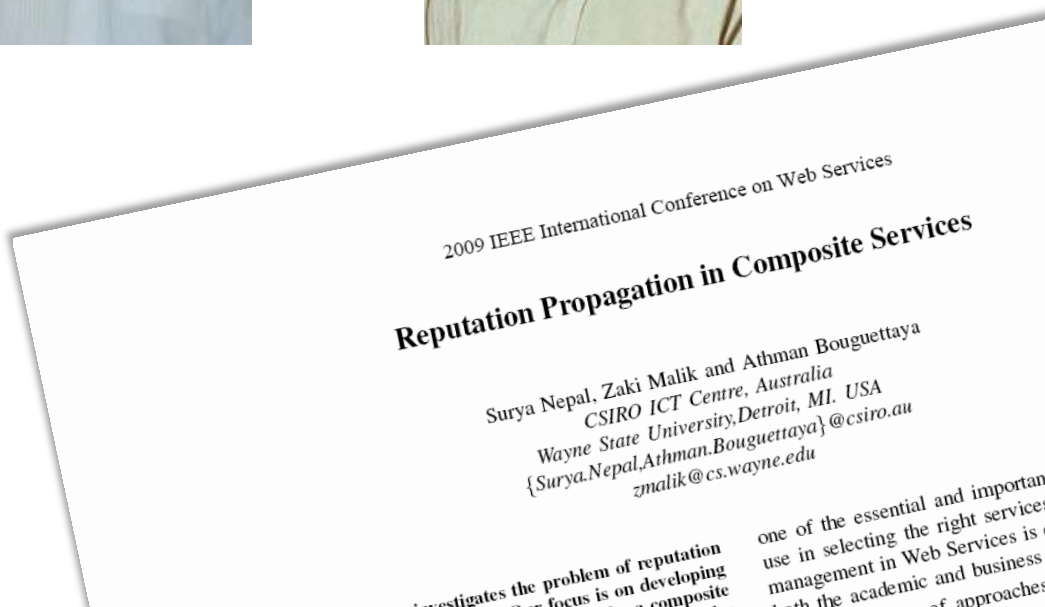
Fabian Lindenberg

Reputation Propagation In Composite Services

Emerging Web Services Technologies
Hasso Plattner Institute
University of Potsdam

The Paper





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Reputation Propagation in Composite Services

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one of the essential and importan
use in selecting the right services
management in Web Services is
th the academic and business
of approaches

Outline

1. Why is reputation important?

Outline

2. What‘s so special about composite services?

Outline

3. How does one propagate reputation fairly?

Service Web

Numerous services
provide similar functionalities
varying in quality

Trust

Trust in the provider‘s ability to meet the expectations

Trust Establishment

rules & regulations, ☒

third party certificates, ☒

reputation ☑

Reputation

Former consumers‘ collective perception

Ebay Sellers

Recent Feedback Ratings (last 12 months)

	1 month	6 months	12 months
Positive	270	882	883
Neutral	1	7	7
Negative	1	2	2

Detailed Seller Ratings (last 12 months)

Criteria	Average rating	Number of ratings
Item as described	★★★★★	661
Communication	★★★★★	660
Shipping time	★★★★½	659
Shipping and handling charges	★★★★★	662

Representation

detailed description,
single value,
multiple values, …

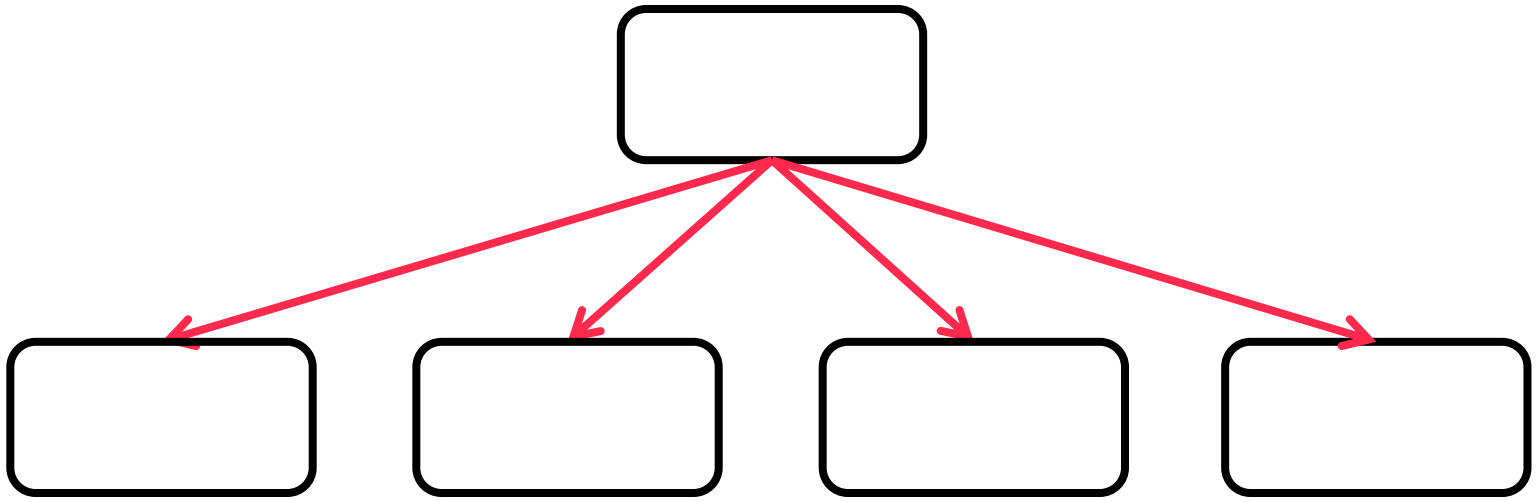
Outline

2. What‘s so special about composite services?

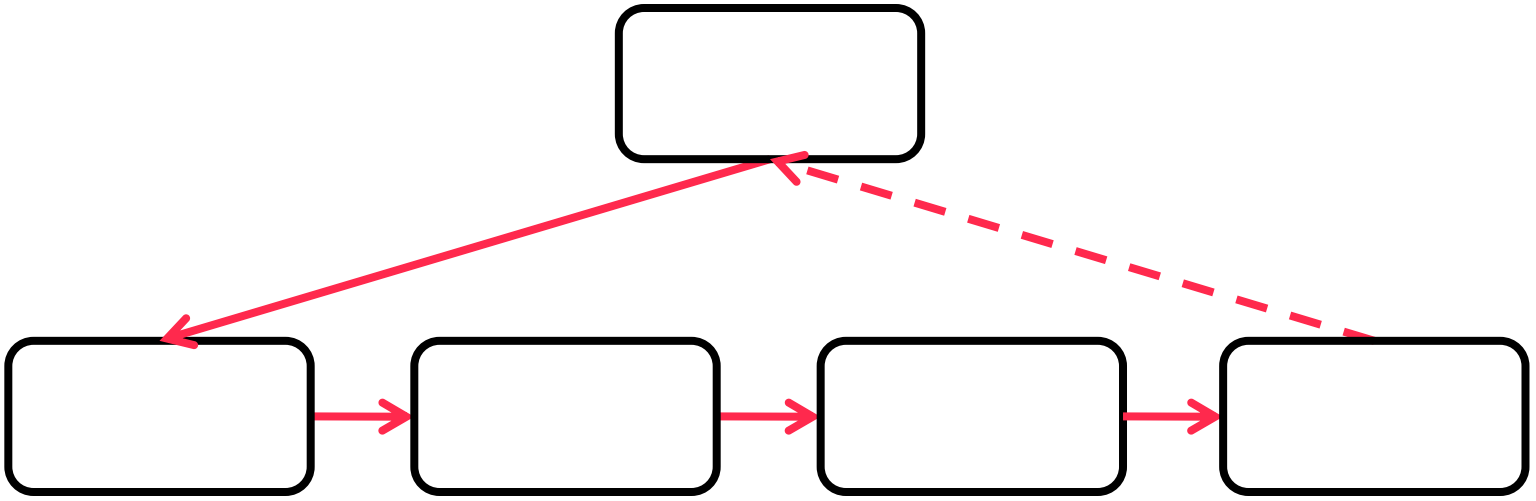
Composition

Creation of new services by combining existing ones

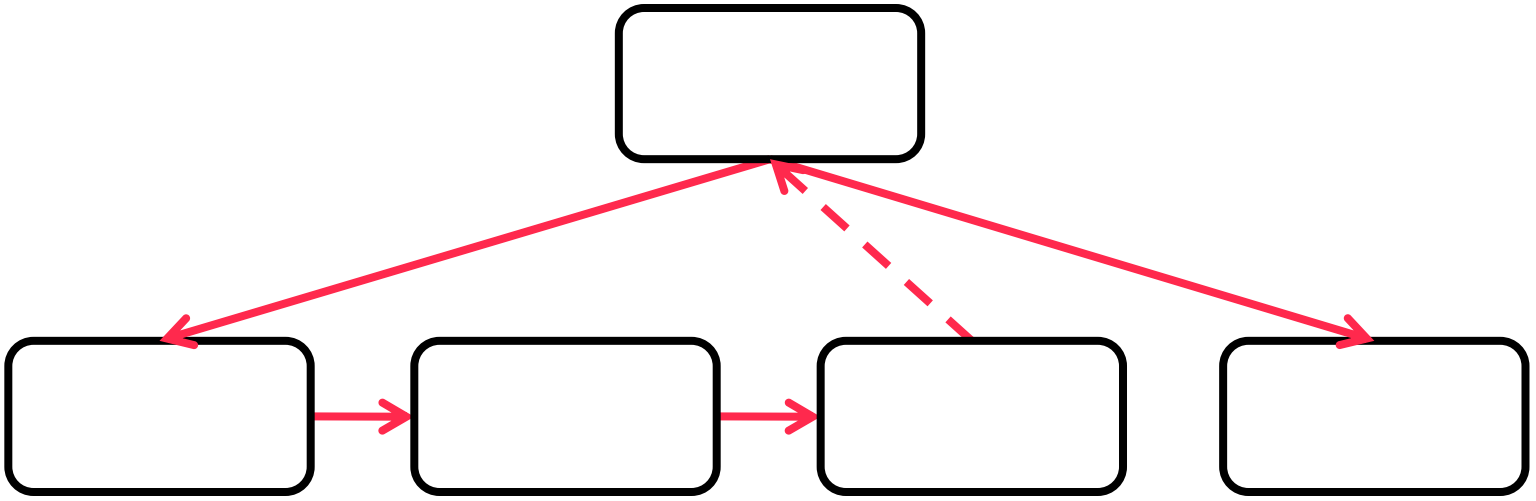
Vertical



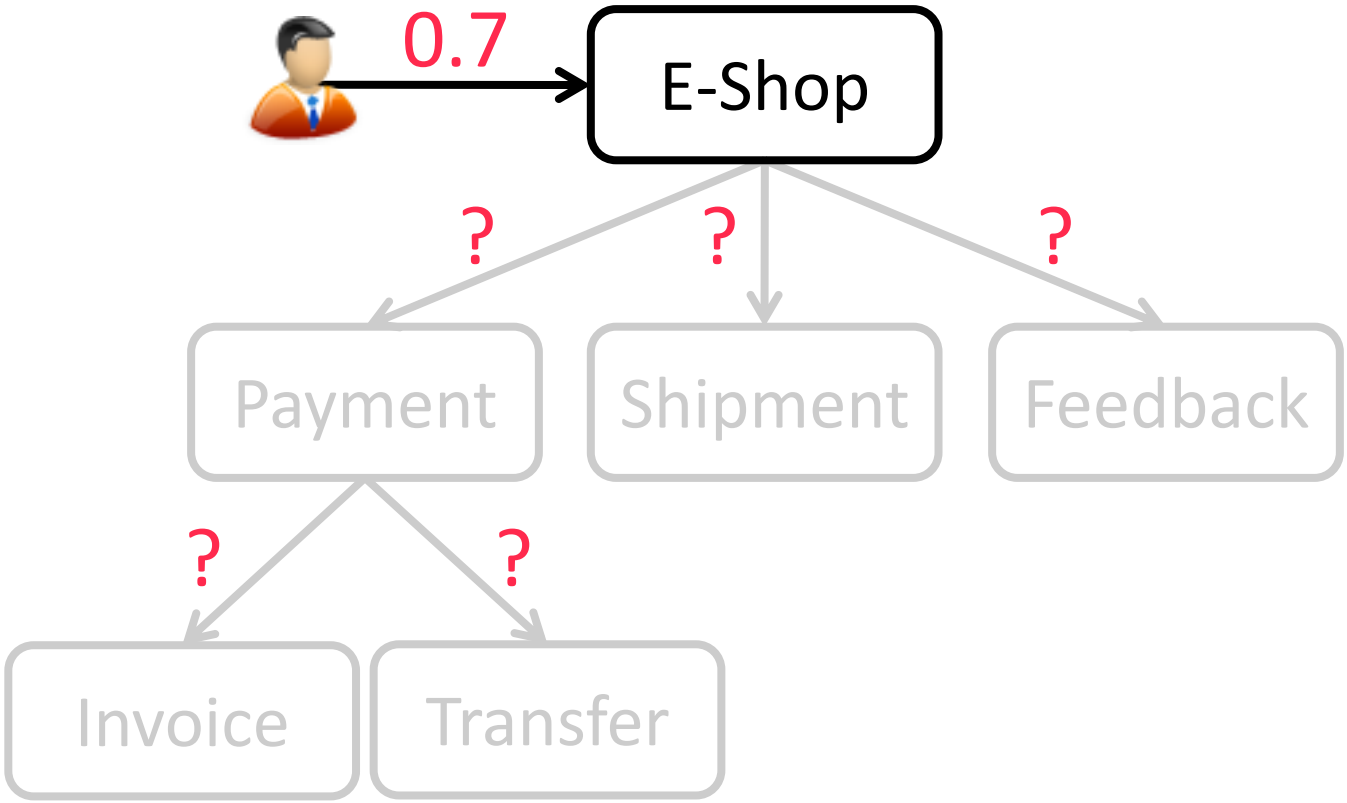
Horizontal



Hybrid

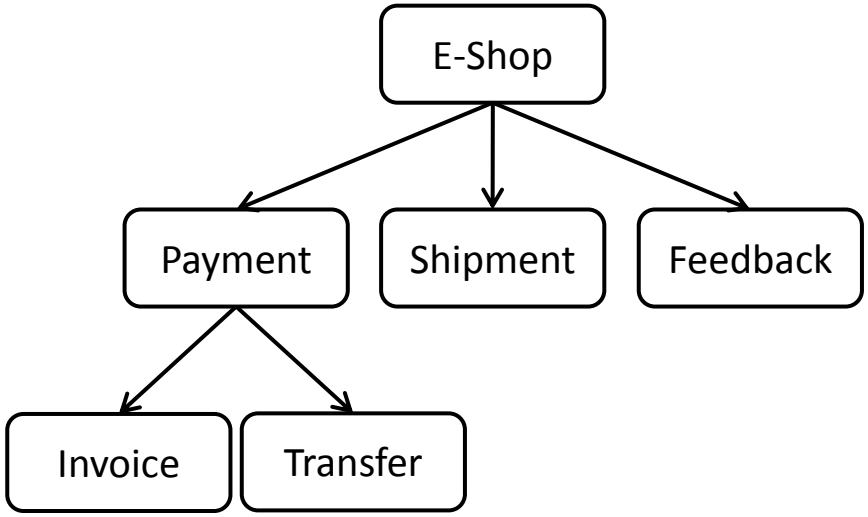


Example



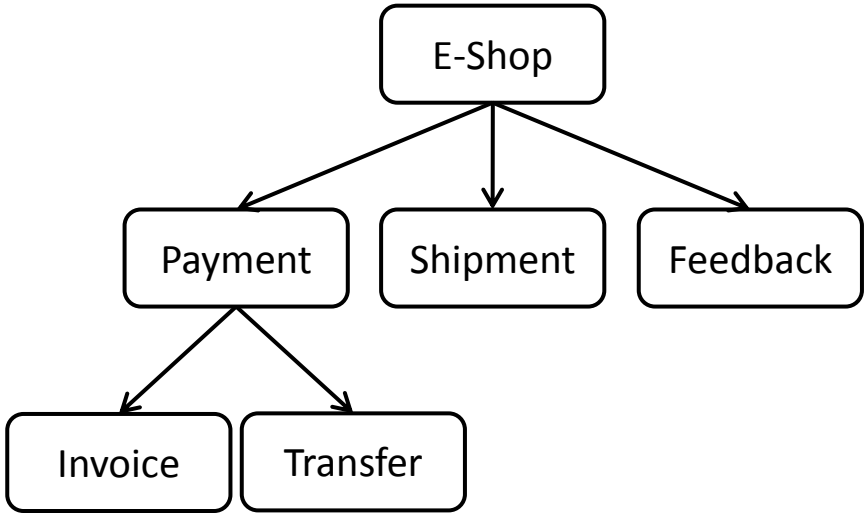
Criteria

1. Different levels of contribution



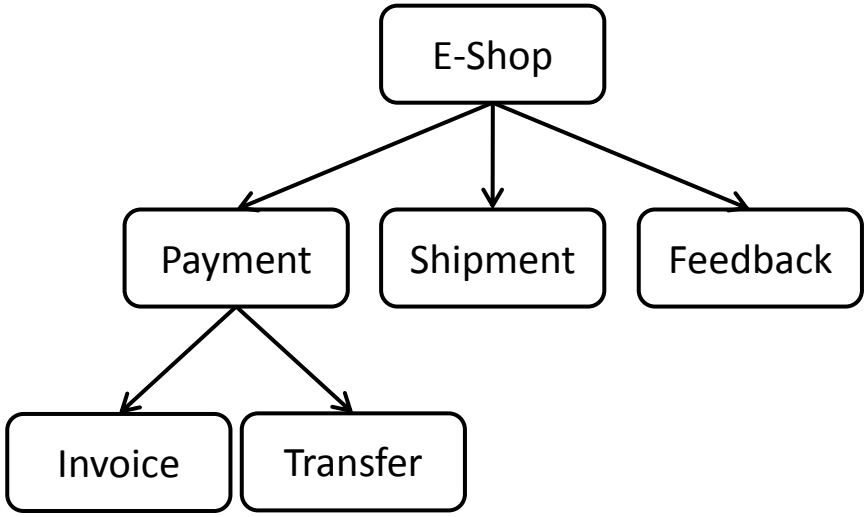
Criteria

2. No penalty for the poor performances of others

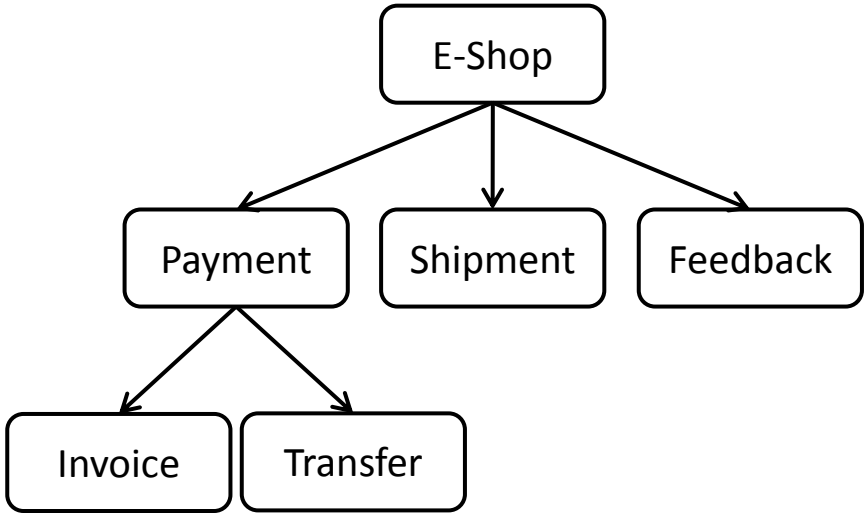


Criteria

3. No reward for the good performances of others



4. Level of composition



Fairness

Respect all four criteria

Outline

3. How does one propagate reputation fairly?

Key Idea

Contribution based on the past behaviour

Assumption

high reputation

high contribution

Propagation

c a composite service

v_c an assigned reputation value

S a set of n component services

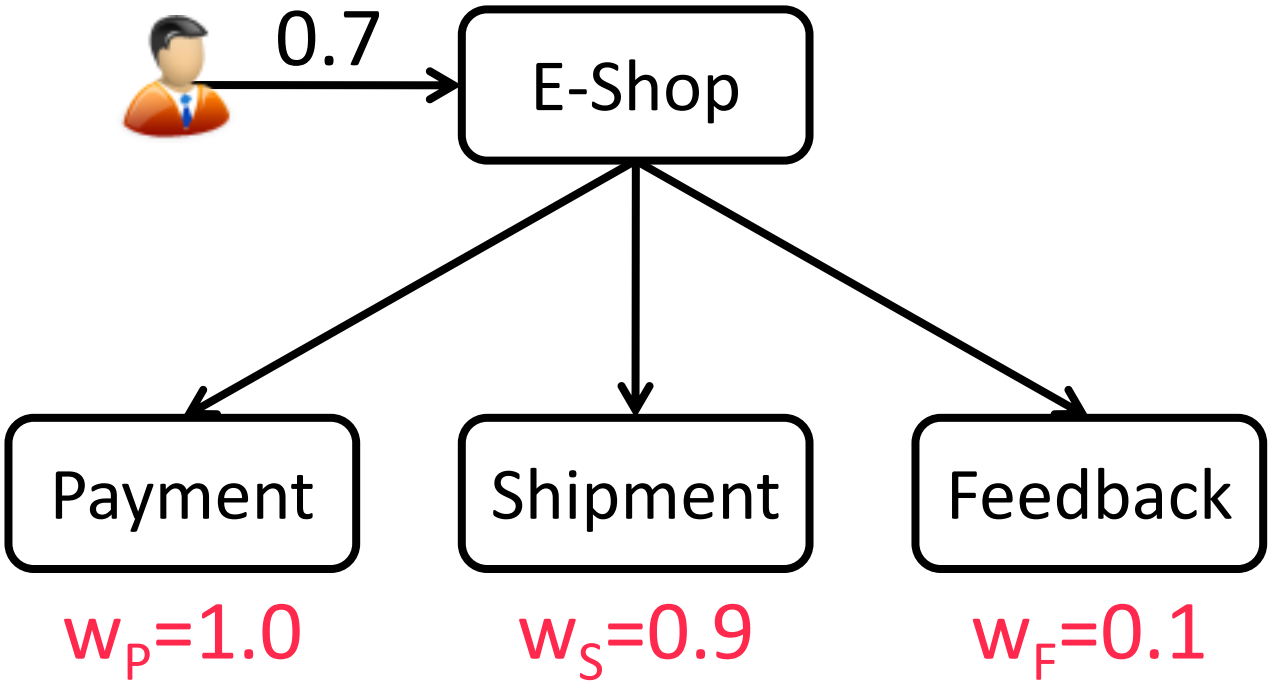
Propagation

Assignment of weights:

$$w_c = (w_{s_1}, w_{s_2}, \ldots, w_{s_n})$$

$$s_i \in S \qquad w_{s_i} \in [0, 1]$$

Example



Propagation

Reputation of a single service s over a period of time k:

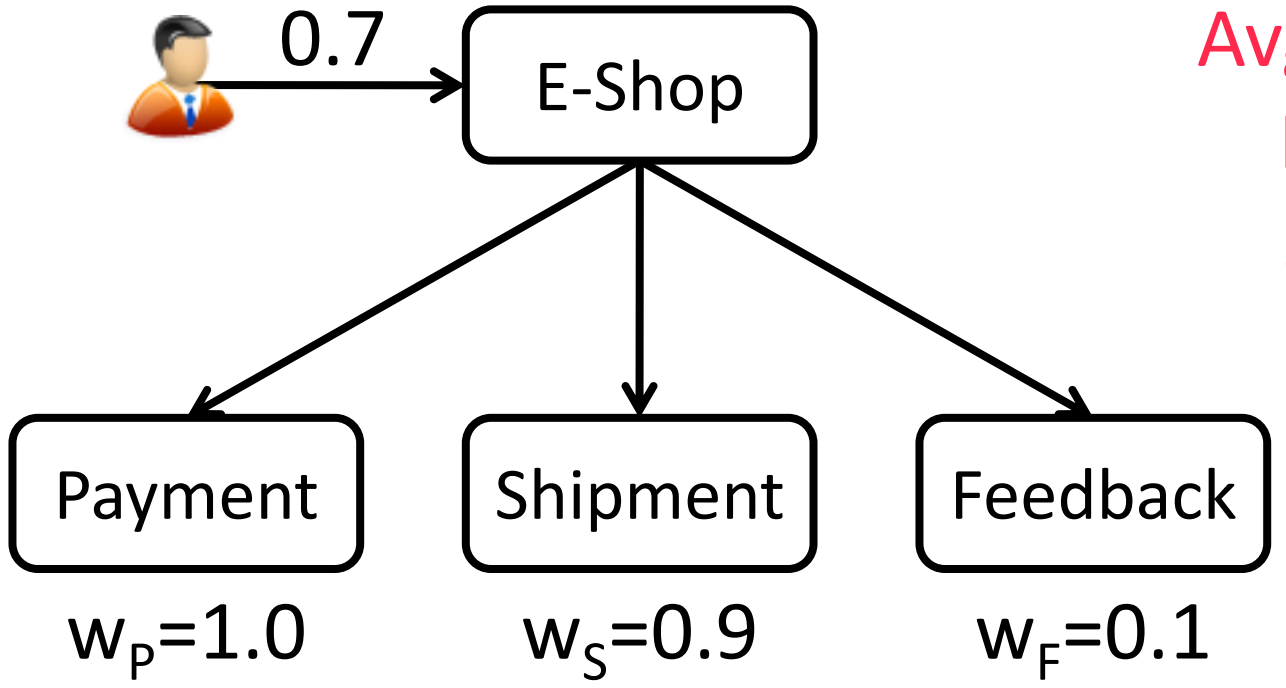
$$r_k^{(s,c)} \in [0, 1]$$

Propagation

Average reputation:

$$r_k^{(S,c)} = \frac{\sum_{s \in S} r_k^{(s,c)}}{n}$$

Example



Avg = 0.75

P = 0.85

S = 0.70

F = 0.70

Propagation

Rate of change:

$$\Delta r_k^{(s,c)} = \frac{r_k^{(s,c)} - r_k^{(S,c)}}{r_k^{(S,c)}}$$

Propagation

Difference new vs. average:

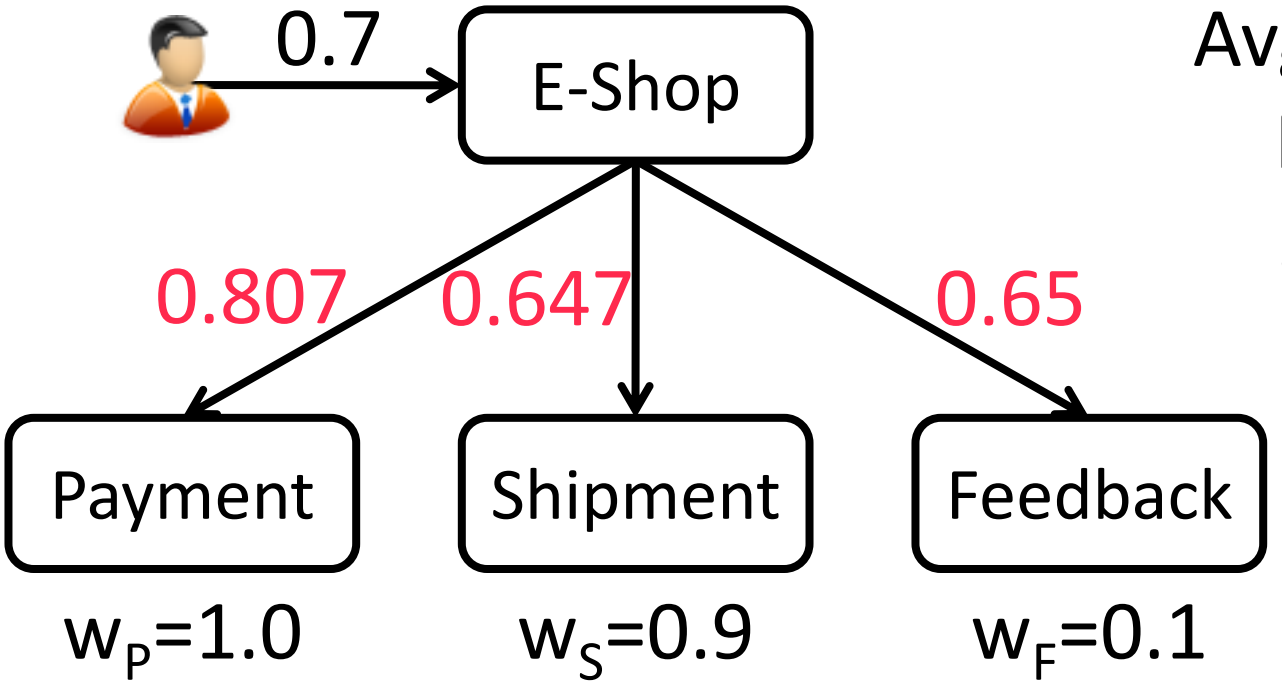
$$\Delta v = v_c - r_k^{(S,c)}$$

Propagation

Propagated value:

$$v_s = r_k^{(s,c)} + w_s \cdot \Delta r_k^{(s,c)} \cdot |\Delta v| + \Delta v$$

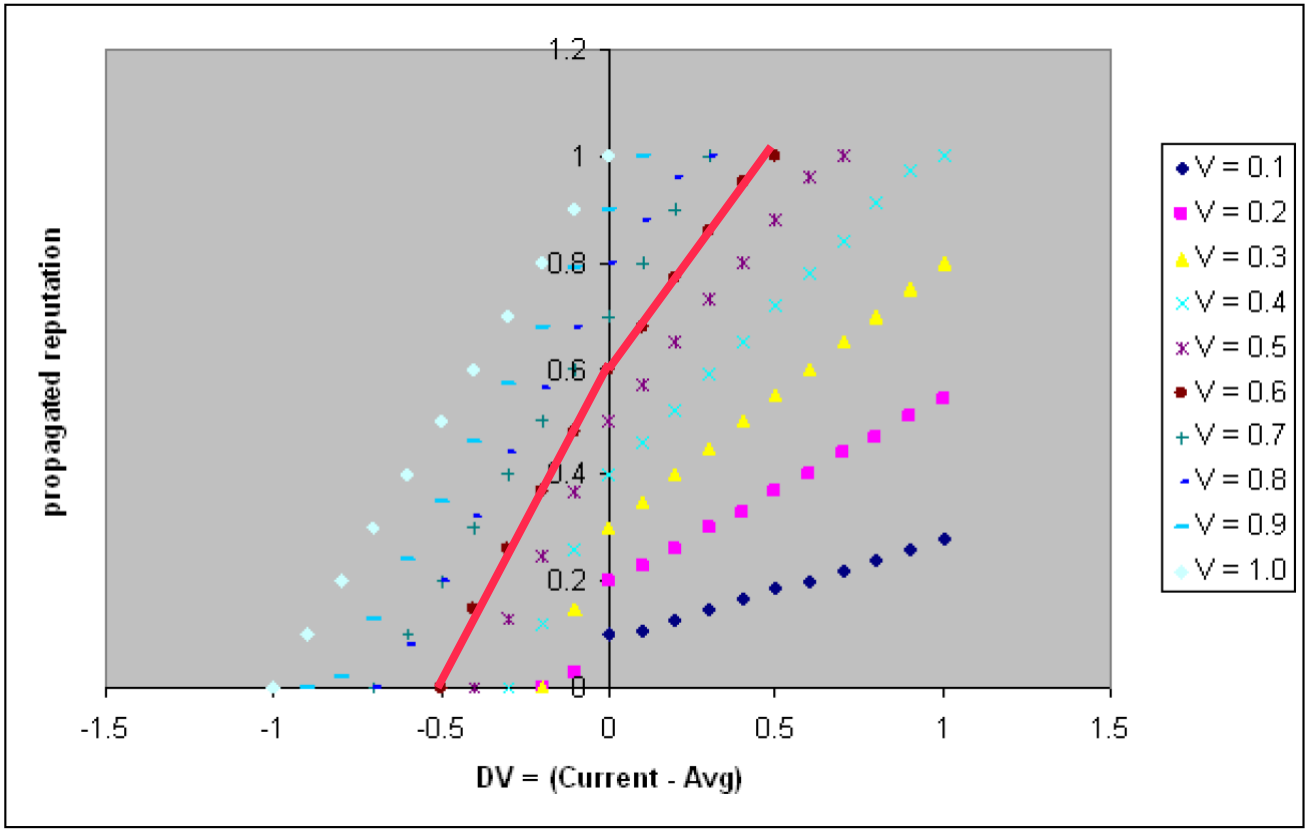
Example


0.7
E-Shop
Avg = 0.75
P = 0.85
S = 0.70
F = 0.70
0.807
0.647
0.65
Payment
Shipment
Feedback
w_P=1.0
w_S=0.9
w_F=0.1

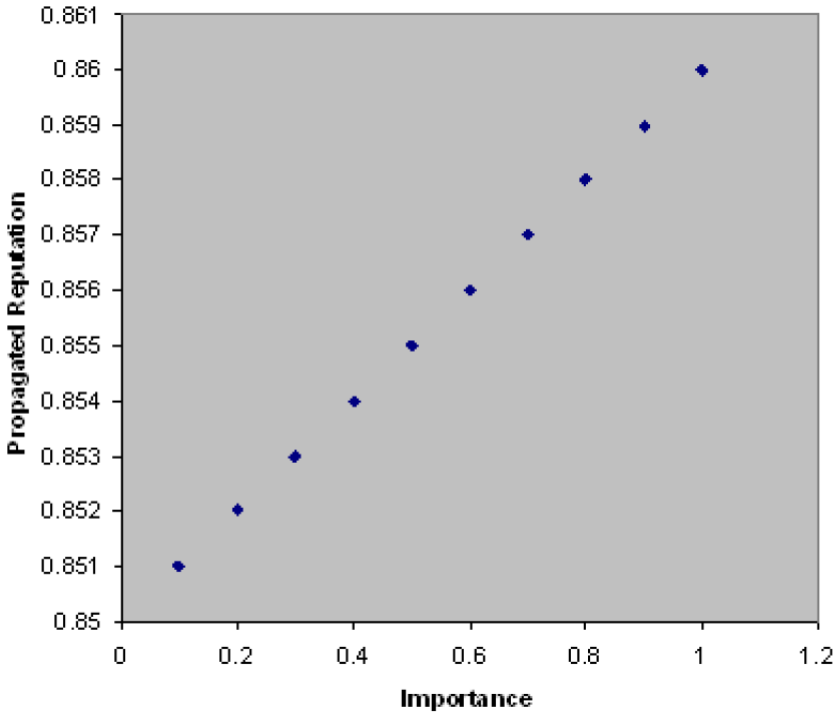
Outline

Evaluation & Discussion

Evaluation


propagated reputation
DV = (Current - Avg)
1.2
1
0.8
0.6
0.4
0.2
0
-1.5
-1
-0.5
0
0.5
1
1.5
V = 0.1
V = 0.2
V = 0.3
V = 0.4
V = 0.5
V = 0.6
V = 0.7
V = 0.8
V = 0.9
V = 1.0

Evaluation



$$v_c = 0.7$$
$$r_k^{s,c} = 0.9$$
$$r_k^{S,c} = 0.75$$

Discussion

reputation concept,
underlying assumptions,
records of past behaviour, …

References

Surya Nepal, Zaki Malik, Athman Bouguettaya
“Reputation Propagation in Composite Services”

Images

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