

**Decentralized Identity Foundation
Hospitality & Travel Special Interest Group**

**Use Case
On-Demand Profile Element Sharing With Providers and Others**

Final – 8 July 2021

1. Use case name:

On-Demand Profile Element Sharing With Providers and Others

2. Short Description:

Capability to share selected elements of one's profile to providers or other parties one wishes to transact with. Could be things like address change, seating preference, high-floor preference, dietary restrictions, etc., as permissioned by the consumer. A peer-to-peer transaction that could be initiated by consumer using his User Agent ("Push") or by the permissioned H&T providers in the wake of a transaction ("Pull").

3. Base Use Case:

None. This is a foundational use case.

4. Plain Language Description:

Bob lives in suburban Chicago. His adult children no longer live at home and he and his wife are moving to a condo on the lake in a "downsizing" effort. Bob is a member of five airline loyalty programs (elite in two), seven hotel loyalty programs (elite in three) and Amazon Prime. He has profiles and logins with AirBnB, Booking.com and Expedia. He subscribes to two newspapers and the Bacon-of-the-Month Club. He has numerous healthcare, banking, finance, and insurance relationships.

In the week prior to moving day, Bob opens the digital wallet/user agent app on his smartphone and opens the Profile tab. He changes the address listed and the user agent asks "Notify merchants and other trading partners of new address? He selects "Yes", and the User Agent shows him a list of trading partner types: Travel, Subscriptions, Banking, Finance & Insurance, Healthcare and Other. When he selects "Travel" it lists the airline, hotel, and OTA programs he belongs to that are SSI-capable and allows him to select which ones to notify now. Same for the other categories of trading partners. "Other" includes the Postal Service and other government organs. Their systems and processes need to be able to accept these notifications. Since the Bacon-of-the-Month Club is not SSI-capable, maybe his user agent tells him that he needs to change that address manually; or maybe it does not. Note that these are "push" transactions, from the ID holder to the merchants and others they transact with on a permissioned basis. The push may take the form of sending a message to the provider and asking them to query the identity hub and update the specified data elements (address), thus making the actual exchange of data elements the same for a push or a pull.

During the move, a mover drops a box on Bob's toe and breaks it. They are going to Florida next week, staying at the Westin Diplomat, a high-rise hotel overlooking the ocean with very long

corridors. He recalls his hotel profile specifies “High floor, Away from elevator” and realizes that it might be a long walk down the corridor on a broken toe. Bob opens his digital wallet, changes his hotel profile preference to read “High floor, Near elevator” instead and sends the change only to Marriott International.

Two to three paragraphs describing a real-life sequence of events that occur in the use case. Use real-sounding names appropriate for people, places, companies, and other named things. Describe the state changes and outcome for each actor. Give a clear description of each actor, such as “Alice, a corporate travel manager for IBM,” or “Jim, a traveler who recently bought a Tesla.”

Make the chronological order clear, using language to indicate any preconditions, the sequence in which the events occur, and the ending state.

If this is a variation of another (base) use case, state only how the use case differs from the base use case.

5. Relevance:

Customer profiles are most often constructed around H&T/merchant loyalty systems. Profiles in these systems exist to capture information that hotels or others wish to know about their customers for the purposes of customer segmentation, outbound marketing, and points attribution etc. Very little attention is given to who the customer is or what he/she wants or likes (preferences), and where preferences exist, they are defined by the products that the hotel has for sale, and do not describe Bob as a person or a consumer.

Within each hotel company's systems, Bob's customer profile is constructed for, and available to, only that hotel company, and it contains only the narrow subset of information directly relevant to that hotel company. Rich information about Bob, possibly derived from profiles that Bob has created with suppliers outside of H&T, for example – Bob drives a Tesla / Bob is a musician / Bob is a runner / Bob likes to Ski / Bob shops at Walmart, is unavailable to the H&T supplier even though Bob might wish this information to be shared if its provision might result in improved customer service or offers (products / services / pricing) interesting Bob. Note that some of this information is available for purchase from third parties today, but not necessarily accurate and may be costly.

Information in Bob's Customer Profile is duplicated many times across Bob's H&T suppliers. To update even simple information such as his address (or any other PII), Bob is required to manually grapple with different access mechanisms, formats and login credentials used by the various H&T suppliers. The significant duplication of effort necessary for even basic profile maintenance tasks disincentivizes Bob from performing necessary profile hygiene and results in low-quality customer information being held by all of Bob's H&T suppliers - a net loss for the suppliers but also for Bob.

The same duplication that results in Bob's multiple customer profiles also removes Bob's ability to aggregate H&T spend and activity across his many H&T suppliers. Over the previous 12 months, Bob has stayed 50 nights with Marriott, but only one night with Hilton. Bob now makes a second reservation with Hilton for 1 night. Hilton values Bob as a low-frequency 2 nights a year customer missing the opportunity to give Bob a frequent-traveler discount that might persuade him to return.

To facilitate the required interactions across travel suppliers during a business trip, Bob is required to present multiple different credentials (passport, boarding pass, visa, health status, hotel reservation, loyalty program number etc.) held in multiple H&T apps and on paper and plastic cards.

Frequently, the same information is required by more than one H&T supplier (passport and health credentials at airport and hotels for example). To save time, and to minimize errors, Bob wishes that he could store all the information required for his trip securely in one place on his phone, and with one action, present just the information required for a specific interaction (airport immigration, plane boarding, hotel check-in).

Planning a future trip to Europe, Bob has learned of a boutique hotel in Paris that he wishes to try out on a free weekend. Bob wants to alert the hotel about allergies and dietary preferences, but as he has never stayed with the hotel brand before, he does not have a customer profile in which to store this information. Bob wishes that he could simply and quickly share the required information while making his room reservation and receive an acknowledgement from the hotel that the allergy/dietary information has been received and actioned.

Bob has recently received offers from travel companies that have made him concerned about identity loss and information leakage. He suspects that the increasingly frequent need to present his driving license and passport to automated systems during travel have resulted in over-sharing information that H&T suppliers have no need or right to know and store.

Why is this a relevant use case for SSI? What aspects cannot be, or have not effectively been, addressed by existing (non-SSI) processes and systems, or can only be addressed suboptimally (such as only by sharing more information than is really needed)?

6. Assumptions:

- User has an app that supports SSI.
- Suppliers have the ability to support SSI interactions
- User has an Identity Hub to store details and preferences
- The app and suppliers (or intermediaries representing them) are conducting peer-to-peer communications so that details are shared securely and only between the user and an agreed party

List any key assumptions that must be true for the use case to be operative. If none, indicate None. Note that for some use cases, it may be difficult to distinguish assumptions (typically items outside the control of this effort) from dependencies (things within its control that are prerequisites); in this case simply combine the two and note in 7 “same as 6”.

“Adoption advocacy,” or the assumption that there is adequate communication and advocacy to spur initial adoption, is an assumption for most use cases and need not be identified separately.

7. Dependencies:

- SSI adoption by at least one customer and one supplier
- “Preference and Details” management capability by customer’s user-agent at the granular level
- **Creation of agreed schemas for the storage and exchange of preferences and details (bi-directional)**
- Schema should be rich and extensible.

Note example of overuse of OTA Extensions in past

List any key dependencies that must be met in order for the use case to be operative. If none, indicate none.

8. Customer & Industry Benefit:

Explain how addressing the use case via SSI solves an industry and/or consumer problem, and key ramifications of doing so. How big/pervasive is the problem? Who does it affect? What (qualitatively or quantitative) would be the impact of solving it?

Consider citing the minimization of shared information as a benefit, reducing the question to “what information needs to be shared to answer the true question,” for example “are you of legal age to buy alcohol” vs. asking to see an ID that has lots of other personal information.

Customer Benefits:

- The traveler / customer is the principal subject of this use case through a focus on Bob’s needs (e.g., broken toe drives customized room location) and Bob’s wants (e.g., his base case profile of a preference for a room far away from the elevator).
- Bob’s journey illustrates the flexibility of SSI: some tasks are delegated to an agent to interface with travel providers who have embraced SSI and DDID, as well as other tasks Bob handles manually / personally with providers less equipped in SSI / DDID practices.
- Note that Bob’s “needs” and “wants” are served by his taking direct action with travel providers (and other non-travel providers) through use of push notifications initiated by the customer or rather, his agent

Provider Benefits:

- Individual travel providers (in this case, the Westin Diplomat Hotel) contacted by Bob not only have his loyalty profile in their loyalty system under business rules and government regulations but they benefit by fine-tuning those rules with specific, situational and real-time enhancements to his profile based on Bob’s revised wants or needs (i.e., a room location change due to his broken toe).
- Addressing accurately Bob’s customized wants and needs is a travel industry benefit because it defines, in large measure, the meaning of “personalized” travel and a means to deliver enhanced services to the guest.
- Bob’s profile is always current, accurate and curated because under SSI, the profile utilized by the H&T provider (Diplomat) gets refreshed with each interaction.
- H&T Providers may determine that they no longer need to maintain centralized profiles because under SSI, the profile utilized can be refreshed as needed, initiated by either party guest or provider; push vs. pull).
 - Alternatively, the provider can store a “skinny” profile instead of a full profile rich with content and preferences, retrieving permissioned profile data when needed
- DDID significantly reduces risk/cost of data breaches and PII regulatory compliance
 - These strategies allow the H&T provider to protect less PII and related data and not need to protect every transaction system, thus reducing direct costs, as well as risk exposure

9. DIF Components Used:

Note: 'Push' of details could be instigated by user directly or by the User Agent based on predefined criteria. Each party verifies their identity to the other prior to the user passing granular data access permissions.

Bob has:

- A valid W3C Decentralized Identifier (DID)
- A DIF Identity Hub, a place to store information that is referenced from the DID that contains:
 - profile elements, (including name and address) used when booking travel.
 - verifiable credentials issued by the SSI/DDID capable H&T companies proving loyalty program membership.
 - messaging capability through which to exchange information with H&T suppliers (amongst others)
- A DIF User-Agent (Identity Wallet) to construct a profile and manage identity.

H&T suppliers where Bob is a loyalty member have:

- A valid W3C Decentralized Identifier (DID)
- A DIF Identity Hub

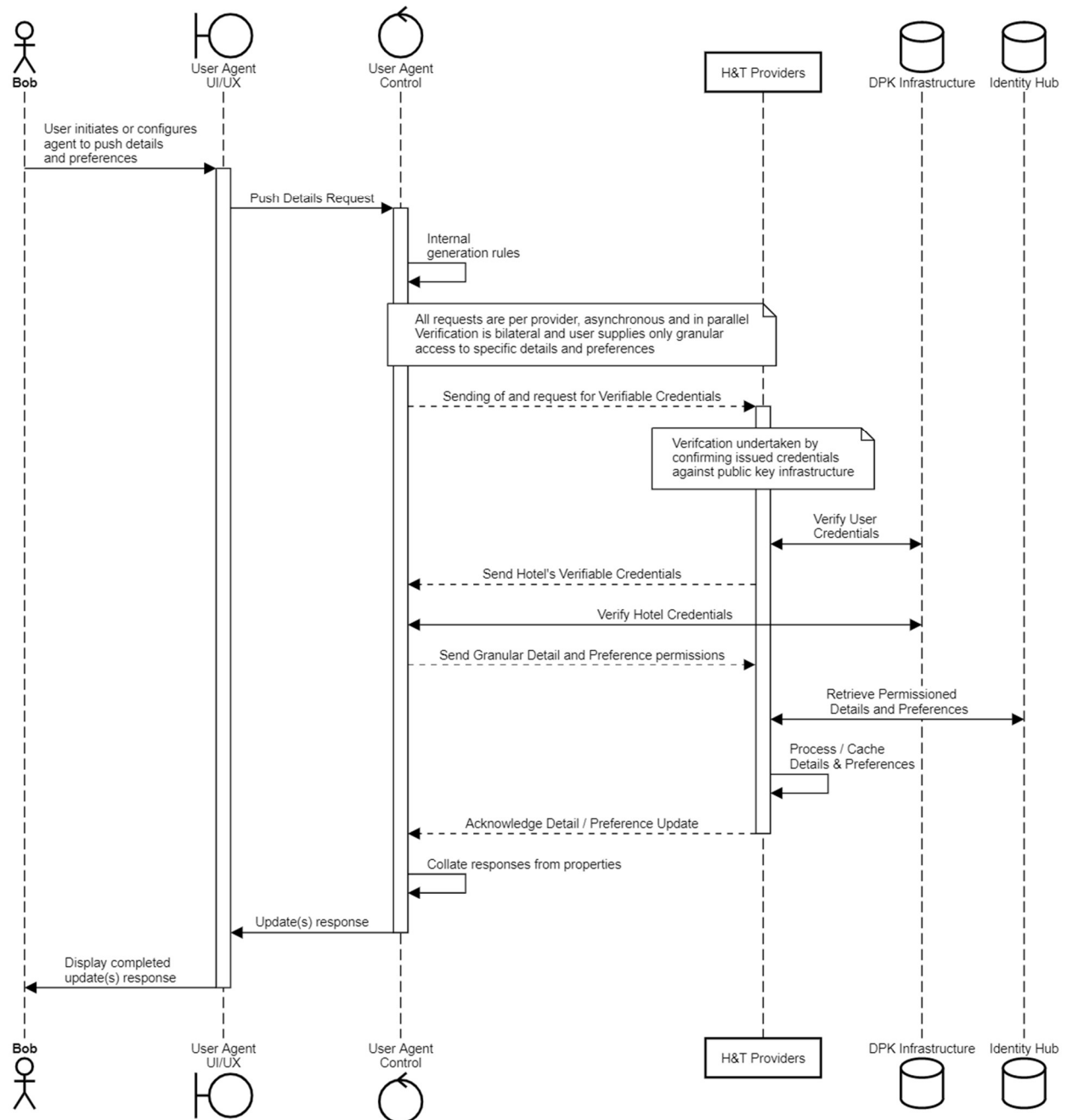
Note: The following sequence diagrams only depict a "push" transaction for the purpose of easier visualization.

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sequenceDiagram
    actor User
    participant UA as User Agent UI/UX
    participant UC as User Agent Control
    participant P as Property 1..n
    participant DPK as DPK Infrastructure
    participant IH as Identity Hub

    User->>UA: User initiates or configures agent to push details and preferences
    UA->>UC: Push Details Request
    UC->>UC: Internal generation rules
    UC->>P: Sending of and request for Verifiable Credentials
    Note over P: Verification undertaken by confirming issued credentials against public key infrastructure
    P->>DPK: Verify User Credentials
    P->>IH: Verify Hotel Credentials
    P-->>UC: Send Hotel's Verifiable Credentials
    UC->>P: Send Granular Detail and Preference permissions
    P->>IH: Retrieve Permitted Details and Preferences
    P->>P: Process / Cache Details & Preferences
    P-->>UC: Acknowledge Detail / Preference Update
    UC->>UC: Collate responses from properties
    UC->>UA: Update(s) response
    UA->>User: Display completed update(s) response
  
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Profiles : Push Elements to H&T Providers



List each element of the DIF architecture that would be used in the solution, with a summary of its role and any requirements that might be unusual; extensions or changes that may be needed to address hospitality and travel requirements; and where use-case specific data and processes would be accommodated (including APIs and schemas). Include a sequence diagram.

Architectural elements may include W3C Decentralized Identifiers (DID), Decentralized Data Stores (e.g. blockchains and ledgers), DID User Agents (aka Wallets), DIF Universal Resolver, DIF Identity Hubs (currently in formulation), DID Attestations, Apps and Services using SSI Data, W3C Verifiable Credentials, W3C Verifiable Presentations, W3C Resolver. For definitions see pages 9-10 of [this document](#). This list may not be exhaustive.

10. Trust Considerations

Where is trust required (and by implication not currently present) for a presented identity or credential to work in the real-world travel domain? Who or what might realistically provide the necessary level of trust?

Bob claims he now lives at a new home address and his work address has changed. His address may be verified through a government agency (DOT?) or a trusted supplier (with a DID) such as a credit card company.

Bob trusts that the information he is sending is to the verified supplier (hotel, loyalty program or OTA) as they have a certified DID.

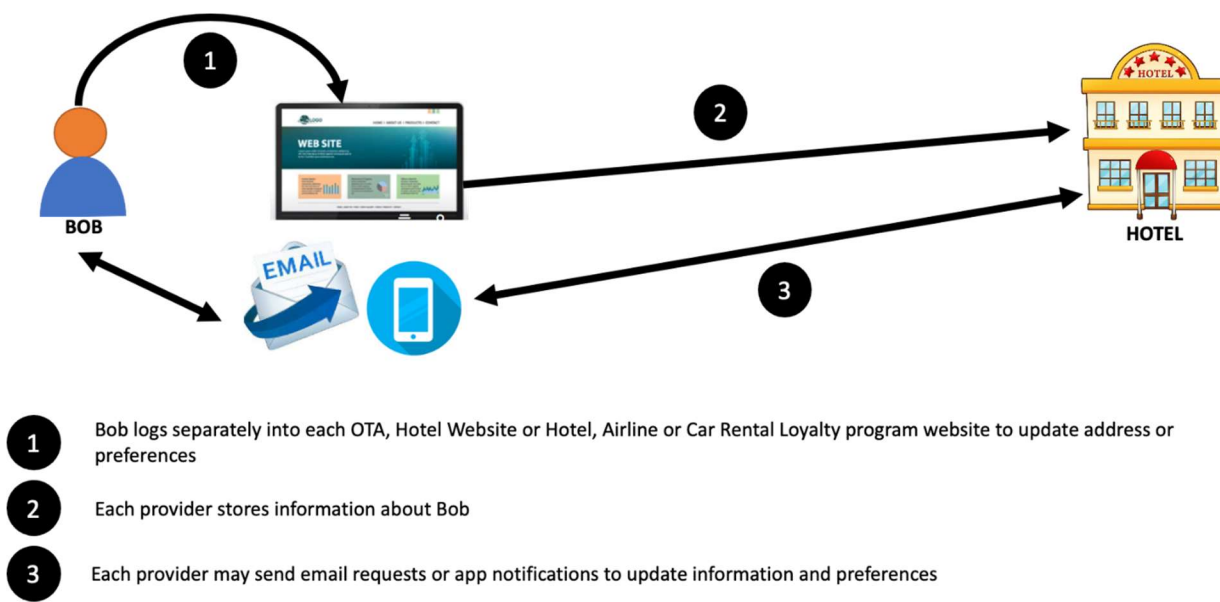
Bob can easily revoke address and other PII from a single or multiple suppliers at one time (the right to be forgotten). He will have much more control over his information and a chain of custody can be established.

11. Current vs. Proposed System Topology

Describe (visually if possible) the flow of information and parties involved (e.g., suppliers, B2B tech vendors, consumer apps) as the problem is handled in the current environment, highlighting any anomalies or challenges; also contrast the proposed environment.

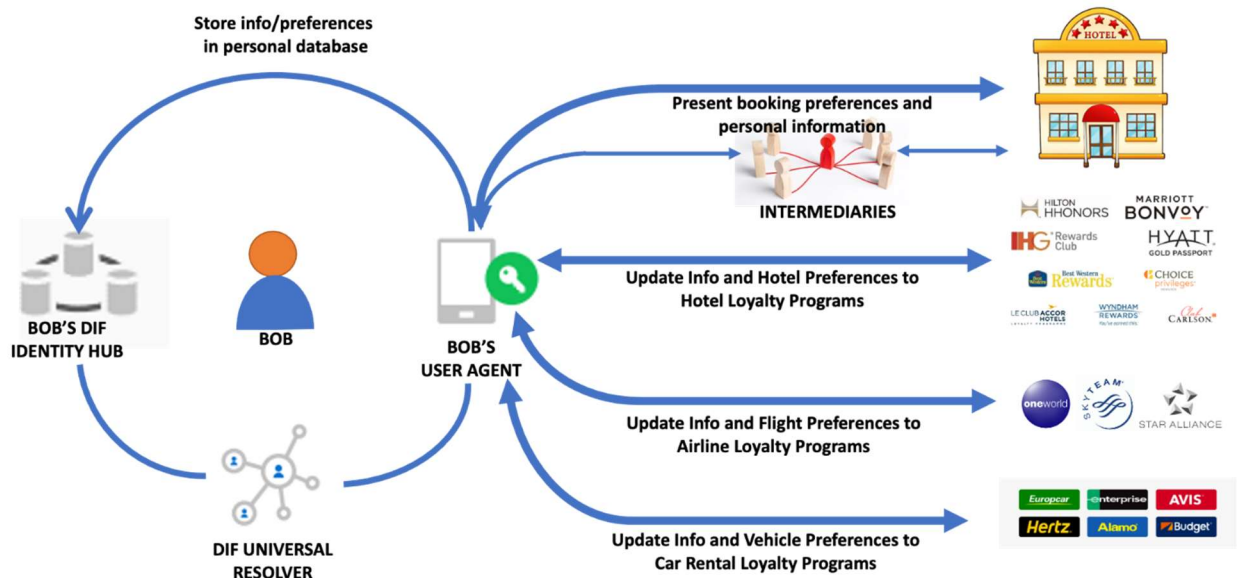
The typical current process is depicted in Figure 1. Bob must log into every OTA, Hotel, or every Loyalty program he belongs to (Hotel, Airline, Car Rental etc.) to update personal information, such as an address change or new cell number and to make sure they have his relevant preferences. Bob has a frustrating experience because it is difficult to know what information they have about him and how he can ensure everything is up to date. Typically, he needs to verify his information and preferences as he deals with each provider on an ongoing basis.

Figure 1: Typical Current Process



Describe (visually if possible) the flow of information and parties involved (e.g., suppliers, B2B tech vendors, consumer apps) as the problem is handled in the current environment, highlighting any anomalies or challenges; also contrast the proposed environment.

Figure 2: Process with DIF



12. Blockers and Enablers:

- Blockers
 - Development and adoption of applications supporting these use cases will take time
- Enablers
 - Banking & Finance and Healthcare need this too, so a generic requirement for SSI
 - This is an easy, obvious, and high-value use case for SSI so should be one of the first things developed

What are the barriers to implementing SSI for this use case? What work is already being done elsewhere that can be leveraged? For example, does a network of trust need to be formed so verifiers do not need to create an unmanageably large list of known issuers? If so, are industry groups or governmental agencies or B2B tech vendors already working on the problem, or would it need to be a ground-up effort? Would key players likely support or resist the new approach? Note that barriers and enablers may have no impact on the validity of the use case but might be useful in prioritizing efforts that face fewer barriers to implementation.