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A Cardless Authorization and Charge System

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With the availability of so many financial and social services, a citizen of today is obligated to carry a bunch of cards in one's wallet. Loss or robbery of wallet carries the risk of, not only, the denial of services, but also, the misuse of information; the most dangerous outcome is access of personal information to criminal and subversive elements. Further, loss of identity card, no matter how intelligent the card becomes, places a person in an awkward position trying to prove one's identity to a law-enforcement agency or own place of work, standing outside in the sweltering heat, bitter cold or rain in torrents, waiting to be recognized. Fingerprinting is *neither* so efficient (time consuming — very-old people, very-young children, people with arthritis of hand and fingers would take more time and may experience difficulty in placing fingers on the pad, additionally, only one person can be scanned on one machine) *nor* so effective (cuts, swellings or abrasions in fingers or thumb render this identification system inapplicable). Iris-scanning system, also, carries the risk of damage to eyeball in case of malfunction of equipment. In addition, only one system of identification carries the risk of statistically significant number of false positives or missed cases. There is a need for a multi-level identification and authorization system, the top level with a pre-defined level of sensitivity and the bottom level with an agreed-upon level of specificity (reducing the number of missed cases and false positives, respectively). Another aspect regarding the current credit systems is their dealing in interest. There is a need to devise a charge system not a credit system (the entire outstanding balance is due for payment at the end of a billing cycle), which conforms to *Islamic Shariah*, at the same time robust enough to add services on demand and, based on the needs of consumer organization, set varied levels of security authorization for persons with different types of clearances taking into account space, time and financial constraints. There is a dire need for a system to be efficient (time should be saved by removing need to sort and take out card from wallet, to scan, to process and to request authorization from a central server) and effective (to reduce chances of fraudulent or forced misuse) with enhanced security features in terms of one-time-usable PIN (Personal Identification Number) for all transactions, generated through mathematical codes utilized in cipher technologies. A cardless authorization and charge system is proposed, to integrate all services into one system, adding additional services as the need arises. This system is expected to be sufficient for all services, *e. g.*, travel (ticketing, car rental — client's preferences stored in database), banking transactions, cash advances, LIFENET — one phone call connects to family doctor, police, immediate relative/close friend, making available the patient database (containing history, current illnesses, medications, allergies and reactions-to-medicines) to the physician (computer system, automatically, tracing the number from where the call is made), message service (call forwarding, fax service on-the-go, express and priority mail forwarding service, courier service), bill-payment service in the absence of client from the hometown (telephone, utility, house rent), telephone card, (optional) photo-identification card (front having organization name, insignia, photograph, last name and designation; back having scanned signatures, bar code, verification code through website — CITI Visa included photograph and scanned signatures following the speaker's (first author) suggestion to the country manager), child registration (which may help locate the law-enforcing agencies in case of abduction, accidental separation and medical emergencies) and security service for home (while the client is traveling). All the above services are accessible through one, easy, toll-free number and there are options to obtain on-screen information using laptop or blackberry. Combined with the photogrammetric-identification system (employing edge-based moiré-fringe topography and edge-based rasterstereography), presented earlier by the speaker in 2008, the cardless system could be used for identification, transaction, travel, security and health services. Mathematical techniques needed to implement this system include graph theory, logic and queuing theory.

Keywords: Identification • Security • Services on demand • Travel • Universal card

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