

Answers to Exercises of Chapter 7

1. Innovation is in our context: any major change that improves the efficiency and safety in one or more Warehouses. Four drivers are identified: (further) harmonization, (increasing) speed of settlement, (improving) user experience and (improving) information security.
2. ISO20022 is a worldwide standard for developing information messages with the aim to harmonize the exchange of information among e.g. payment service providers and FMIs (i.e. the whole Warehouse and between Warehouses). In terms of the Warehouse methodology please have a look at Figure 5.2: ISO 20022 has a major impact on harmonizing the *information processing* (the 'how' of the Warehouse). It can also be compared to a cookbook to which everyone can contribute their own recipes. See also the reference in the bibliography, *ISO 20022 for Dummies*.
3. LEI stands for Legal Entity Identifier and its aim is to provide fast and precise identification of a legal entity (who is who?) but may also provide ownership information (who owns whom?). Lack of swift availability of this kind of information was one of the lessons learned of the Lehman Crisis. The Global Legal Entity Identifier Foundation (GLEIF) can be seen as the guardian of LEI. The LEI of an entity *x* is composed of an alphanumeric string of characters of fixed length (20) with no embedded intelligence except for the four characters on the far left (they indicate the operating unit which keeps the identifiers unique) and the two characters on the far right (they are check digits). The differences between IBAN and LEI in general are that the IBAN length differs between countries and that the IBAN number has a structure usually consisting of the name or acronym of the bank and the account number while the LEI has a fixed length and a random assignment of the 14 characters 'in the middle'. The similarities are that both have check digits and that they are unique identifiers. The LEI of *x* identifies the legal identity of *x* while the IBAN of *x* identifies a bank account with *x* as the owner.
4. SEPA stands for Single Euro Payments Area and is a major step forward in harmonizing retail payments among euro area countries but also some other European countries. The aim of the SEPA Instant Credit Transfer (SCT Inst) is to increase the settlement speed of the credit transfer. Banks could - and did - already offer fast settlement for 'on us' payments in the three-corner model on their own since no coordination or harmonization across the interbank space was needed. However, in the four-corner model harmonization is needed which is provided by the rules of the SEPA Instant Credit Transfer adhered to by participating banks.
5. Target2-Securities (T2S) has been built to harmonize the settlement of securities in Europe. The aim is to overcome the barriers (EPTF) which make settlement in Europe more expensive than elsewhere. T2S is a technical platform to which CSDs respectively central banks have outsourced their securities accounts resp. their RTGS settlement accounts enabling cross-border DvP.
6. T2S appears also in the Danish Warehouse on the middle floor from 2018 onwards as the Danish Krona is now also a settlement currency making T2S multicurrency (euro and Danish Krona).
7. TIPS is the acronym for the instant payment offering of the Eurosystem (Target Instant Payments Settlement). The relation between SCT INST and TIPS is that the former provides the harmonization of instant payments rules in the SEPA while the latter provides central bank money as the settlement asset for instant payments.
8. Strong Customer Authentication in the sense of PSD2 means that for authenticating the customer at least two different factors must be supplied by the customer. There are three categories of authentication: possession, knowledge and inherence (see page 120). This enhances information security of the retail payment as the attacker needs to gain access to two factors instead of one.

9. Exemptions are allowed in general for transactions with low risk in case of compromise. Examples are an individual payment with a low value (< EUR 50) or a series of contactless payments at PoS not exceeding EUR 150 or not exceeding 5 payments. Cases in which you have used Strong Customer Authentication remotely usually involve a one-time password (generated by your bank) or the use of fingerprint on your mobile. For PoS non-contactless payments with your card you have applied SCA when you have inserted the card and supplied the PIN.
10. The most convenient way to pay in different situations is of course highly dependent on your personal preference. For every case you could choose one of the four innovation drivers for improvement.