«Core Banking»	ISO/TC 68/SC 7
Date: **2016-04-04**	Doc. Number: **N 668**

Assistant:
Filomena VIEIRA
Direct Line : + 33 141 62 84 65
mariafilomena.araujovieira@afnor.org

Your contact:
Clément CHEVAUCHÉ
Direct line: + 33 141 62 82 79
clement.chevauche@afnor.org

Report from SG 1 on digital currencies

DOCUMENT TYPE	Report
DOCUMENT SOURCE	SG 1 Convenor
COMMENTARIES	-
FOLLOW UP	For information and consideration at the upcoming SC 7 meeting
BACKWARD POINTER	-

	Working Group, Technical Group **Date of Report:** March 22, 2016 **Date received by Secretariat:**
	ISO/TC 68/SC 7 **N**

Group Name:	**Chair/Convenor and Secretariat:**
TC 68/SC7 Study Group on Digital Currency	Claudia Swendseid

Issues presented for decision to ISO/TC 68/SC 7

1. Accommodate any digital currencies with a monetary authority (i.e., fiat digital currency) under the existing ISO 4217 Standard and process, without change, as the need arises.

2. Request a work group to look specifically at a "second tier" standardized registry for digital currencies without a monetary authority, building on the work of this Study Group. The Study Group recommends this work take place within the next six to twelve months.

3. Request that SC2 establish a Study Group and/or new work item for the security aspect of digital currency in financial services, in coordination with SC7. The Study Group recommends this work take place within the next six months.

4. Request that ISO TC 68 establish a Study Group on the broader implications to standards that arise from distributed ledger, blockchain, and other emerging technology with representation from several or all of the ISO TC 68 subcommittees where the new technology is likely to have influence. As part of establishing the Study Group, ISO TC 68 should coordinate with and reach out to other relevant ISO technical committees. The Study Group recommends initiating this work within the next three months.

Issues presented for discussion to ISO/TC 68/SC 7

1. Refer to the attached report of the Study Group on Digital Currency

Background

Digital currencies, such as Bitcoin, Ethereum, Ripple, Litecoin, and others are used by consumer and businesses for different purposes including payments for purchase of real world goods and services[1]. Platforms have been set up to allow cash in and/or cash out for such currencies. These digital currencies may be used as a replacement of "real" currencies in financial transactions. Several stakeholders are interested in re-using existing infrastructures and related standards (e.g., ISO 20022) for clearing and settlement of transactions in such currencies. Theoretically, this could be feasible, as ISO 4217 Codes for Representation of Currencies and its Maintenance Agency currently allow the creation of new currency codes (upon approval of monetary authorities and The World Bank).

The legal status of digital currencies differs from country to country. Dedicated currency codes may be used by regulators to track the financial transactions where they are used. In order to take a proactive approach to the rise in use of digital currencies, ISO TC 68/SC7 chartered this Study Group to assess the business needs, the feasibility and the impacts and eventually to propose a New Work Item for the revision of ISO 4217, if needed. The participants of the Study Group include experts from SC7 members and liaisons as well as the ISO 4217 Maintenance Agency (see Appendix 1: Study Group roster).

Study Group Scope of Work and Approach

Digital currencies are an emerging topic with wide-ranging impact and interest across disciplines and tend to raise questions about computer science, cryptography and applied mathematics, banking and money, and financial technology. To ensure a targeted and productive effort, the Study Group limited its scope to addressing the specific issues that it was tasked to review by TC 68/SC7.

The Study Group agreed that ISO Standard 4217 is well-established and referenced and that any standardization for digital currency should prioritize maintenance of the current standard as a goal. The Study Group reviewed the potential need to incorporate digital currency within the standard and assessed the international demand for such currencies.

As a general approach the Study Group noted that its review of ISO 4217 would need to explore the accommodation of a description of: 1) real currencies with a responsible authority and determined geographical location (as currently addressed in the standard), as well as; 2) digital currencies that have such fiat authority, and; 3) digital currencies without a recognized or geographically located authority. The study additionally explored the importance of the two established three-character codes within the standard and the potential limits to applying such codes to digital currencies (ISO 4217 specifies the structure for a three-letter alphabetic code,

[1] Of the three principle uses for money: as a medium of exchange, a store of value, and a unit of account, the Study Group observed that these virtual currencies have not thus far become widely referenced as a unit of account and are self-contained as stores of value; they principally interact with standards through exchange.

commonly referred to as "CCY," and an equivalent three-digit numeric code for the representation of currencies and funds).

The Study Group also resolved to assess some related issues, including how security concerns related to digital currencies should be addressed and possibly to offer comment on the SC2 framework, though revision and recommendations to SC2 are not within the scope of this group. Members of the Study Group observed that other aspects of digital currency such as the underlying technology (e.g., blockchain) may benefit from ISO standards and could be considered by relevant committees within TC 68 or even other ISO technical committees. The Study Group may refer these questions to a separate body, recognizing that ISO 4217 does not address all associated issues.

The Study Group convened by recurring conference call from late 2015 through early 2016. To accomplish its work, the group began by affirming its scope of work and working definition of terms. The group also solicited input, particularly through a web-hosted survey, from other experts through outreach to industry participants and members of other standards groups and committees (e.g., W3C, TC68).

Definition of Digital Currency

The current ISO 4217 Standard references, in its scope, the applicability of its specified three character codes to *currencies* and *funds.* The standard includes definitions of a *currency* as a "medium of exchange of value, defined by reference to the geographical location of the authorities responsible for it" and funds as "monetary resources associated with a currency."

The Study Group has been tasked with assessing the need, feasibility, and impact of a possible revision to include mediums that utilize replacements for *currency* without a corresponding monetary authority with a geographical location, as is possible in today's digital world. Initial discussions brought to light the difficulty of settling on a standard term for such replacements for *currency*, and the potential implications of the term used. For example, "virtual currency" has been widely used in discussions of the topic, though others have recognized some limitations in the term. "Cryptocurrency" similarly, may be interpreted to refer only to currencies that employ a specific method (cryptography) of issuing and tracking the currency. Thus the Study Group defined a term that can appropriately address the emerging currencies that are relevant to ISO 4217.

For its purposes, the Study Group considers that the definition of the term *currency* may be amended to exclude reference to geographical location and responsible authority in order to address emerging currencies that do not rely on such authorities. The definition of *currency* as a "medium of exchange of value" broadly encompasses conventional currencies as well as decentralized, virtual, and digital mediums of exchange for inclusion in the Standard.

Additionally, the Study Group recognizes that there are fundamental differences between currencies that have a geographically-located central bank or institutional sponsor (i.e., fiat currency), and the recent examples of "currency" produced in decentralized or virtual

communities. The Standard today is written to include only the former. Therefore the group uses a definition of terms to preserve the current process, where applicable, and delineate a separate process for alternate scenarios. The Study Group defines *monetary authority* as a central bank or institution that issues currency and is recognized and verifiable by the World Bank. In this way, the standard might afford separate treatment of *currency* issued by a *monetary authority* (i.e., fiat currency) and currency without a recognized *monetary authority*.

Further, the Study Group defined the term *digital* for currency that exists as electronic representations of value. A *digital currency* may refer to a variety of implementations, from decentralized stores of value on a shared ledger to existing currencies that have been centrally issued through digital means (i.e., fiat-based digital currency).

The Need for a Standard to Accommodate Digital Currency

The Study Group's examination of the available market data shows that there is a growing use of digital currency. There are (conservatively) more than 100,000 transactions per day in non-fiat digital currency. These transactions include exchanges of non-fiat currency for fiat currency as well as purchases of goods and services, in some cases facilitated by a digital currency exchange platform as an intermediary. The total "market cap" value of all such currencies (the stock of currency created multiplied by its current exchange value) is denominated in billions of dollars and exceeds the value of some established fiat currencies. Notably, this value and level of trade has largely emerged only within the last five years. Moreover, websites that track these markets list several hundred digital currencies without a (fiat) centralized monetary authority. However, market data also makes clear that the vast majority (more than 80%) of the value and transaction volume are attributed to a single cryptocurrency, bitcoin.

The results of the Study Group's survey confirm this picture of the market. Approximately one-third of respondents identified evidence of demand for digital currency codes, requests to accommodate digital currency denominations, and a need for standards. A clear majority of respondents expect the demand for digital currency code standards to increase over the next 3 to 5 years and expect standards to be needed in that timeframe. At the same time, survey respondents note in their comments that participation and interest in digital currency is generally limited to specific communities and primarily focused on bitcoin.

Industry experts particularly note that the ISO 4217 Standard designates permanent, non-reusable codes for currencies and recognize some level of incongruence between assigning codes to a potentially large number of newly created currencies, and the future viability of each of those currencies; to date, only bitcoin appears to have achieved substantial use. No non-fiat currency has demonstrated longevity, as broader use has only begun in the last five years. There have also been a number of security and fraud issues with non-fiat digital currencies. Direct feedback from participants in cryptocurrency organizations advised strongly against applying ISO 4217 currency codes to these types of digital currency at this time. The dynamic nature of this market suggests that current examples of these currencies may be fleeting. Thus, these respondents said that until there is more certainty about the longevity of these currencies, standards may be premature.

At the same time, there is a strong case that some standards should be considered for digital currency. Digital currency could benefit from definition and standardization as the concept matures. Moreover, while it may be possible to defer any action regarding digital currencies from an ISO TC 68/SC7 perspective, it is not possible for some other areas (e.g., the FIX Protocol) to ignore that these currencies are being traded and used for settlement now. As a result, an interim symbology for digital currencies is already developing in an unstandardized fashion. For example, comments received in the Study Group's survey in particular noted multiple pseudo-CCY (three-letter) codes employed for designating bitcoin. Thus, absent an ISO 4217 standard revision to accommodate these currencies, an ISO-developed interim symbology may be beneficial. In the Study Group's outreach efforts, some industry experts suggested alternate means of standardizing currency codes outside of the ISO 4217 Standard and creating a "sandbox" for temporary use of codes.

To this end, a "second tier registry" could serve as a "sandbox" and might not need to be compliant with the current ISO 4217 Standard format or compatible with the existing financial applications that require its use (i.e., as digital currencies are created in emerging technological areas, newly developed systems may not be limited to three-character identifiers and could instead rely on a reference to URL or other format. As other groups standardize digital currency symbology for their own use outside of ISO it may occur in such a way that it could evolve into an existing or future ISO standard). Inclusion in such a second tier registry should require some level of review and accreditation based on a review of security and a demonstration of credible distribution and market use. Additional work remains to determine the proper maintenance body for a non-fiat currency registry, the data elements that would be required, and the specific registration process. Another key consideration is that the non-fiat digital currency registry should remain clearly delineated from the codes for currencies with a monetary authority, recognizing that the legitimacy and regulatory desirability of such currencies can vary between jurisdictions and may require differing treatment. The "second tier" would endeavor to strike a balance between enabling standards to take effect and avoiding the implication of universal acceptance.

Ancillary technology with application beyond currency expands the need for related standards work. In fact, since the formation of the Digital Currency Study Group, there have been a number of announcements related to diverse industry efforts toward common standards for these technologies, particularly blockchain.[2] In the simplest terms, the blockchain is a shared ledger with cryptographic controls that can create a distributed, unalterable record for near instantaneous exchanges of information and value without the need for trusted counterparties or third parties.[3] To fully elucidate why this tool in particular may have broader application that creates a productive field for standards work to facilitate progress, a deeper examination of the technology may be helpful. The Study Group references example reports that may further an

[2] hyperledger.org, r3cev.com and others are convening industry participants to initiate common standards.
[3] The Economist has published two articles that further detail the blockchain and its application:
http://www.economist.com/news/briefing/21677228-technology-behind-bitcoin-lets-people-who-do-not-know-or-trust-each-other-build-dependable
http://www.economist.com/news/leaders/21677198-technology-behind-bitcoin-could-transform-how-economy-works-trust-machine

understanding of virtual currency and blockchain in the Reference Documents on the final page of the body of this report.

The pace of change and ongoing innovation, especially related to the technology layer of blockchain, warrants continued study by ISO and not only ISO TC 68/SC7 but also other relevant technical committees. Four common elements across blockchain implementations include: 1) shared data ledger, 2) consensus model (or nonrepudiation), 3) smart contracts (or business rules) and 4) cryptography (for security, privacy, and identity). Each of these elements may benefit from study with respect to the benefit of standards development. This conclusion is additionally supported by a recent report by the UK Government Scientific Advisor, which recommends:

> *Government needs to work with academia and industry to ensure that standards are set for the integrity, security and privacy of distributed ledgers and their contents. These standards need to be reflected in both regulatory and software code.*[4]

Key Issues Related to Modifying the 4217 Standard

From a practical standpoint, there are a number of barriers to applying the ISO 4217 Standard as it currently exists to digital currency without a monetary authority. Three key issues have been highlighted in Study Group discussion:

- Establishment of a currency code relies on World Bank verification of the monetary authority that issues the currency. This process cannot be applied to currencies that have no central authority or when the issuing authority is not a recognized national/geographic institution. There is not an alternate process designated for the maintenance agency to establish a code without a geographical monetary authority.
- The three-digit structure of currency codes limits the ability of the Standard to accommodate the potentially large number of digital currencies that can be created and would exceed the number of all available currency codes.
- The legal status of digital currencies worldwide is questionable. There is an unknown potential for a standard to include a digital currency that is prohibited in some nations and a risk of implied legitimization of such currencies through assignment of a code under ISO 4217.

The Study Group discussed some possible alternate approaches to the maintenance agency verification and inclusion of codes for digital currencies. Some level of due diligence would be required if the monetary authority verification is not applied. Any verification process would need to establish objective criteria for acceptance to the greatest degree possible. For example,

[4] Distributed Ledger Technology: beyond block chain
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

currency may need to pass certain thresholds for distribution, use, and security that could be established by another body with expertise in the area (perhaps SC2).

The ISO 4217 Maintenance Agency is able to allocate around 500 3-digit numeric codes to new currencies. It is technically impossible to deal with the number of digital currencies currently in existence (much less all of those that may emerge in coming years) without a change of the underlying code structure. Moreover, the existing code structure is ingrained in current technology applications and may tie-in to other coding schemes[5] so that a fundamental change to this format could have broad implications to the compatibility of systems and processes and prove very costly. Within ISO TC 68/SC7, Work Group 12 (currency codes) is dormant and could potentially be reanimated to review the standard for accommodation of a larger potential base of codes. Since fiat-backed digital currencies could be accommodated quite easily by the existing ISO 4217 Standard, it is not clear whether that review should take place prior to the next scheduled revision of the Standard in 2018.

If these issues are not addressed, the risk is that non-fiat currencies will use non-ISO official currency codes as they grow in acceptance. If these currencies cannot be accepted or referenced across an exchange or network (e.g., SWIFT) that uses ISO standards, there may be a stifling effect on the ability to bring financial technology innovations into the mainstream.

Study Group Recommendations

The Study Group concludes with the following key recommendations to SC7:

1. Accommodate any digital currencies with a monetary authority (i.e., fiat digital currency) under the existing ISO 4217 Standard and process, without change, as the need arises.

2. Request a work group to look specifically at a "second tier" standardized registry for digital currencies without a monetary authority, building on the work of this Study Group. The Study Group recommends this work take place within the next six to twelve months.

3. Request that SC2 establish a Study Group and/or new work item for the security aspect of digital currency in financial services, in coordination with SC7. The Study Group recommends this work take place within the next six months.

4. Request that ISO TC 68 establish a Study Group on the broader implications to standards that arise from distributed ledger, blockchain, and other emerging technology with representation from several or all of the ISO TC 68 subcommittees where the new technology is likely to have influence. (Note: this recommendation is consistent with the fact that other groups are initiating work in the same area including SC2 and SC4 and as part of the ISO TC 68 strategic review.) As part of establishing the Study Group, ISO

[5] https://www.unece.org/fileadmin/DAM/cefact/codesfortrade/codes_index.htm

TC 68 should coordinate with and reach out to other relevant ISO technical committees. The Study Group recommends initiating this work within the next three months.

Recommendations 1 and 2 are responsive to the key issues related to modifying ISO 4217. Since fiat currencies, digital or not, are easily accommodated under the existing Standard, it is only the consideration of digital currency without a monetary authority (that may legally be classified as a commodity under some regimes) that creates a challenge. Recommendation 2 serves to highlight this critical difference in emerging digital currencies and emphasizes a distinction between fiat and non-fiat currency. It aligns with a balance of the reservations against permanently memorializing potentially ephemeral currency and the desire to accommodate a demonstrated need for usable nomenclature in financial technology, which was expressed by respondents to the survey conducted by the Study Group.

Recommendations 3 and 4 are a product of the Study Group's discussion that identified important issues relevant to standards but outside the Study Group's specific focus on 4217. For example, in contemplating a modification of the standard to accommodate digital currency, concerns about the security and legality of alternative currency emerge as particular areas for concerted work. Noting these issues, the Study Group drafted a specific communication to SC2 (Appendix 2). The potential impact of digital currency and blockchain technology clearly extends beyond the scope of this Study Group to all TC68 subcommittees and likely beyond TC68 to other ISO technical committees. The work of the Study Group found broad support for a larger consideration of standards work as it relates to blockchain.

Reference Documents

Bank for International Settlements Committee on Payments and Market Infrastructures. "Digital Currencies." November 2015. http://www.bis.org/cpmi/publ/d137.pdf

Dong He, Karl Habermeier, Ross Leckow, Vikram Haksar, Yasmin Almeida, Mikari Kashima, Nadim Kyriakos-Saad, Hiroko Oura, Tahsin Saadi Sedik, Natalia Stetsenko, and Concepcion Verdugo-Yepes. "Virtual Currencies and Beyond: Initial Considerations" IMF Staff Discussion Note. January 2016. http://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf

European Bank Authority. "Virtual currency schemes – a further analysis." February 2015. https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf

Government Office for Science. "Distributed Ledger Technology: beyond block chain" A report by the UK Government Chief Scientific Adviser. January 2016. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

Joshua Baron, Angela O'Mahony, David Manheim, Cynthia Dion-Schwarz. "National Security Implications of Virtual Currency: Examining the Potential for Non-state Actor Deployment" 2015. http://www.rand.org/pubs/research_reports/RR1231.html

Appendix 1: Study Group roster

Role	Appointed by	Country	Stakeholder category	Name
Convener	ISO/TC 68/SC 7	-	-	Swendseid, Claudia
Committee member	AFNOR	France	F - Standards application	De Sousa, Maria
Committee member	AFNOR	France	A - Industry and commerce	Epaillard, Pierre
Committee member	AFNOR	France	A - Industry and commerce	Gualbert-Febrer, Frédérique
Committee member	AFNOR	France	A - Industry and commerce	Hertzog, Patrice
Committee member	ANSI	United States	A - Industry and commerce	Baxter, Cynthia
Committee member	ANSI	United States	A - Industry and commerce	Busch, Janet
Committee member	ANSI	United States	A - Industry and commerce	Crabtree, Brian
Committee member	ANSI	United States	A - Industry and commerce	Griffin, Phillip
Committee member	ANSI	United States	A - Industry and commerce	McKenna, Karla
Committee member	ANSI	United States	A - Industry and commerce	More, Braden
Committee member	ANSI	United States	A - Industry and commerce	Northey, Jim
Committee member	ANSI	United States	B - Government	Rozycki, Daniel
Committee member	ANSI	United States	A - Industry and commerce	Scheidt, Ed
Committee member	BSI	United Kingdom	A - Industry and commerce	Jones, Lauren
Committee member	BSI	United Kingdom	A - Industry and commerce	Ryan, Kathy
Committee member	BSI	United Kingdom	A - Industry and commerce	Seymour, Anthony
Committee member	DIN	Germany	A - Industry and commerce	Beyritz, Ingo
Committee member	JISC	Japan	E - Academic and research bodies	Okada, Hitoshi
Committee member	NEN	Netherlands	A - Industry and commerce	Karsten, P.
Committee member	NEN	Netherlands	C - Consumers	Potgieser, P.G.L.

Committee member	SAC	China	A - Industry and commerce	LI, Kuan
Committee member	SAC	China	A - Industry and commerce	LI, Huifeng
Committee member	SAC	China	A - Industry and commerce	SHANG, Zhiyu
Committee member	SCC	Canada	A - Industry and commerce	Williams, Cathy
Committee member	SN	Norway	A - Industry and commerce	Hassel, Fredrik
Committee member	SNV	Switzerland	A - Industry and commerce	Juri, Gabriel
Committee member	SNV	Switzerland	A - Industry and commerce	Nikles, Marianne
Committee member		United States	B - Government	Johnson, Gloria
Committee member		Germany	-	Poehlmann, Ulrike
Committee member		United States	A - Industry and commerce	Brasile, Jason
Committee member		United States	A - Industry and commerce	Guar, Nitin
Liaison representative	SWIFT	-	A - Industry and commerce	Eloy, Jean-Marie
Document monitor	DIN	Germany	-	Lamm, Andreas
Document monitor	JISC	Japan	-	Kitagawa, Nobuhisa
Technical programme manager	ISO	-	-	Marinkovic, Stefan

Appendix 2: Referral to SC2

Following is a copy of the email and draft communication that was sent to Mr. Clement Chevauche, chair of SC 7 regarding our request to send a communication to SC 2. This email was sent on November 9, 2015.

Email:

Dear Clement Chevauche,

I am contacting you in my role of chair of the TC 68/SC 7 Study Group on Digital Currency. As you know this study group is assessing the need, feasibility and impact of a possible revision to the ISO 4217 Currency Code standard to accommodate digital currency.

During the study group's deliberations, members have noted the importance of also considering developing security standards for digital currency but have agreed that such work is outside the scope of our study group. However, we think such an effort should be evaluated by TC 68 SC 2 and have prepared a memo from us to the chair of SC 2 to express this view.

My understanding is that the appropriate protocol is for me as chair of the study group to ask you as the secretariat of TC 68/SC 7 to distribute our communication to SC 2. The communication we propose is shown below. In addition, I have attached to my email the draft *Framework for Secure Digital Currency* mentioned in the communication.

Please let me know if you have any questions or need anything more from me before distributing this communication.

Thank you for your help.

Claudia Swendseid

Draft Communication to SC 2

Date: November 9, 2015

To: Kim Wagner, Chair of TC 68/SC 2

From: Claudia Swendseid, Chair of TC 68/SC 7 Study Group on Digital Currency

Subject: Security Standards for Digital Currency

Copy: Chair of TC 68/SC 7, Members of Study Group on Digital Currency

The TC 68/SC 7 Study Group on Digital Currencies has determined that the security of a digital currency is out of the group's current scope of work, as our work is focused on assessing the need, feasibility, and impact of a possible revision to the ISO 4217 Currency Code standard to accommodate digital currency

However, the Study Group on Digital Currency thinks that developing security standards for digital currency is an important undertaking. Thus, the Study Group requests that TC 68/SC 2 consider establishing a new work item for the security aspect of digital currency as they relate to financial services. A draft *Framework for Secure Digital Currency* has been started and is attached to this memo for SC 2's use.

The SC 2 security work, should you decide to proceed with it, should be coordinated with the SC 7 Study Group and any other ISO TC 68 work efforts concerning digital currency as such efforts evolve.

Please contact me with any questions at 01-612-204-5448 or Claudia.swendseid@mpls.frb.org

---

Draft Framework for Secure Digital Currency

Premise	Sub-Premise	Questions/Suggestions
Must be recognized Through ISO 4217 (Currency Codes)		
Must be adaptable to A Distributed architecture and a central control architecture		
ISO, ANSI x9, and other standards are security building blocks		
New International and national standards are included for an approved secure architecture		
Existing digital currency architecture model(s)	Generation of a Value Unit. Distribution & communications process A settlement/Clearing process	
Role of Commodity and Role of Payment		
Digital Currency Credit payment architecture		
Digital Currency Debit payment architecture		

Premise	Sub-Premise	Questions/Suggestions
Anonymity or Identity Authentication		
Block chaining or Hybrid Block chaining encryption	Role base or rule base access control with policy enforcement through encryption	
Security for a Distributed Ledger	Open or Proprietary Distributed Ledger	
Protecting a Virtual Data object	Security travels with data Process integrity	
Token security		
End-to-end security		
Accommodate legacy security components		
Security components for a financial Transaction		
Third party compliance and validation assurance		

Appendix 3: Survey questions and complete responses

1	**Has your organization received a request to accommodate digital currency denomination?**	
	No	**29**
	Yes	**15**
	Comments	
	we are studying digital cerrency for 2 years	
	Loyalty points	
	Periodically clients look for exchange rates, volatility, etc for Bitcoin on the system. On occasion we've seen requests for Ripple or some of the lower liquidity blockchain objects	
	Accept bitcoin as payment for dues	
	Our company operates only with digital currencies, we do not use fiat (USD, EURO, etc). All bills are paid, salaries, servers, and operations etc are in Bitcoin and other digital assets. Our customers contact us and need to discuss bitcoin orders. So, standards in this regard would be great!	
	We accept donations in Bitcoin.	
	FIX Protocol is in use trading bitcoin. We have had requests for broader support of digital currencies, especially currency codes.	
	Off the back of research and experiments we are conducting	
	We've been asked to guild digitial currency for various banks	
	No formal request received, though we already refer to Bitcoin as BTC all the time so it would be unusual for anyone to request us to do so.	
	An email after the BSI Digital currency standards kick off	
	Request from 2 digital currency organisations to raise this issue to ISO	
	The request had to do with how to express the currency code for some of the new cryptographic currencies that are being created today.	
	The banks have received requests from customers and partners on digital currency, but not yet business related.	
2	**Are you aware of any evidence of demand for digital currency identifier standards that have been made to you or others?**	
	No	**30**
	Yes	**14**
	Comments	
	Bitcoin, since it does not have a formal company behind it, has many different designs, symbols, etc. Standardization would be very helpful for the industry.	
	If we are to process digital currencies as distinct from fiat then we will need specific identifiers	

	Yes banks financial institutions who want to facilitate digital asset trades as well as these standards will enable merchants to trade without the banks as a necessity. See: http://www.visaeuropecollab.com/news/2016/1/12/epiphyte-visaeuropecollab-rethinking-remittances	
	As a bitcoin wallet and exchange, we regularly see our customers use "BTC" to refer to their bitcoins in correspondence with us.	
	From within the Bitcoin community and on forums	
	Financial transactions are being made involving Bitcoin and other digital currencies. This can be "currency exchange" transactions (e.g. against USD, CNY) or payment transactions for goods and services. As digital currencies are being used, albeit on a very small scale, some demand for a unique identifier exists.	
	Would like an official ISO currency code so as they can be officially identified across a network or exchange	
	I personally buy and sell Bitcoin, and trade using Bitcoin when I can.	
	FIX has had requests from users on how to identify cryptocurrencies, especially bitcoin.	
	The topic has come up in product direction discussions with customers.	
	Yes, the Web Payments Interest Group is currently struggling with the correct way to express currency codes in a generalized way for codes that don't exist (like Ripple, Ethereum, Ven, etc.)	
3	**<u>Have you seen non-standard digital currency codes in use?</u>**	
	No	**27**
	Yes	**17**
	Comments	
	Loyalty points, closed loop payment	
	For internal purposes to classify these transactions eg DAT (digital asset trade)	
	Not yet	
	As above, "BTC" is used all the time among bitcoin users. There are a few services using "XBT" but we see that less regularly.	
	DIY attempts by individuals in the community.	
	BTC, LTC, ETH, DOGE, and many more. Also XRP is used for Ripple, which seems to be an attempt to apply the logic of the ISO standard. See: http://coinmarketcap.com/. As central bank, one element of our work is to monitor relevant developments and to communicate on these development when needed. We have occasionally referred to non-standard digital currency codes that are in use.	
	XBT is already being used for Bitcoin, and widely.	
	Bitcoin, Ripple, Dash	
	Obviously much of the web world uses BTC to refer to bitcoin, but that's a violation of ISO rules. We use XBT exclusively	
	This gets used often: ฿ as well as the thai bhat symbol (which is awkward since it's already used for the bhat): ฿	

	People don't know how to refer to it. BTC, XBT, etc. (I am not in the financial services industry, so my answer may lack the sophistication of others.)	
	All the time -- mostly to represent currency codes not yet supported in deployed products.	
	BTC actonym is widely used across the Internet. Currently it does not concern "mainstream" financial industry in a significant way but most probably it will in the near future (R&D departments of most innovative banks are already working hard in that area).	
	Yes, Bitcoin (BTC) is the most relevant example... followed by Ripple, Ethereum, etc.	
4	**Thinking about questions 1, 2, and 3, how frequently have you observed such examples?**	
	N/A	**19**
	Rarely	**8**
	Occasionally	**11**
	Routinely	**6**
5	**Over the next 3 to 5 years, how do you expect the demand for digital currency code standards to change (assuming there is no change to established standards now)?**	
	remain low/unchanged	**6**
	increase modestly	**22**
	increase significantly	**12**
	no view	**3**
6	**Is there any other information you are aware of that supports the need to revise the current ISO 4217 Standard to accommodate digital currency codes? If so, please describe that information.**	
	Comments	
	- increasing usage of bitcoin and other crypto-currencies - formal application of bitcoin currency standards by the Bitcoin Financial Standards Working group	
	There will need to be some form of sensibility of approach to ensure that a raft of short term digital currency codes are defined and then expire shortly thereafter. Also where there are a large number of fractional parts (i.e. Bitcoin has 8) then there may need to be consideration of how this is defined	
	its not's just the digital currency code it's the digital asset code that will be signficiant. For example, the issuance of a crypto bond on a distributed ledger	
	We often use three-letter codes instead of currency symbols as they are more likely to be consistently displayed across different devices in different regions.	
	Increased adoption and awareness of bitcoin in particular.	
	N/A	
	the need for digital currency code standards could be strictly connected to the acceptance of such currencies from Government/Authorities	

	Whilst there are some digital currency organisations that have requested an ISO currency code, the ISO WG need to be careful that the standard isn't amended to cater for a few but for a widening industry need. Engagement with Central Banks and exchanges is an important piece of this work.	
	No	
	BSI, the UK's national standards body, following a consultation by UK government is in the early stages of scoping with industry a standard for consumer protection covering issues operational, relating to risk/security and consumer interaction - no currency codes.	
	No	
	As we believe that there will be an increasing demand for creating standards for cryptocurrencies, we also believe it should be possible within the existing framework.	
	No	
	Currently Bitcoin is a larger money stock than several dozen national currencies. It is used by several million people around the world, and over 150,000 transactions per day are being processed, which is growing steadily. At this point, ISO codes are appropriate for its standardization.	
	Standards support for Bitcoin the currency seems responsible now. It would be a pity if an overly conservative approach to inclusion of Bitcoin in currency standards were to stand in the way of modernization of the money/currency environment and thereby the financial services industry. Given network effects, Bitcoin proper will be an important currency for the foreseeable currency. A few altcoins may rise to prominence over time, so the standards should prepare to accommodate a class of digital currencies. But I don't think any altcoin is necessarily positioned for inclusion in the standard now.	
	The governance on which currencies should be assigned official ISO 4217 will be difficult. Parallel effort for global OTC derivative identifiers resulted in country codes being assigned for OTC derivatives. The "EZ" code was created to address this need. It is likely we could create one or more country codes for non-sovereign currency instruments.	
	no, there isn't any other information. The only thing i know, ISO 4217 was willing to change the way the currency codes are built. They have been planning to change the current 3 digit code (eg: USD) to 4 digits code.	
	In my opinion some clear rules for new currencies introduction should be defined. Since the amount of new currencies appearing and disappearing is (and will be) really big the process of their evaluation should be formalized. For example the reference point for evaluation could be the average or minimal value of currencies already represented in ISO 4217. So I think the question is not "if" review the standard (which is inevitable) but "on what basis".	

	Many businesses are currently equipped to take Bitcoin (for example), but it is normally translated into currency type. Improved regulation will require the disclosure of the original currency used in a transaction. The standard also needs to be equipped with a method for accommodating short term "new codes" (extensibility).	
	Yes, the way ISO4217 currently allocates digital currency codes, and the speed at which new digital currency codes are created are incompatible. ISO should NOT issue currency codes for what could be "flash in the pan" currencies (like Bitcoin, for instance), but should instead create a "sandbox" and mechanism for registering new digital currencies (with little to no barriers to entry).	
7	**If you believe there is demand for digital currency code standards, in what time frame do you think these standards will be needed?**	
	more than 5 years	**3**
	3 to 5 years	**11**
	1 to 3 years	**20**
	within 12 months	**7**
8	**Are there any other standards that you believe require revision or development in order to accommodate digital currency (e.g., is there a need for a standard relating to the security of digital currency, or a need for standards related to blockchain)?**	
	Comments	
	blockchain and security standards need to be investigated	
	It is interesting whether ISO20022 formats etc will need to be enhanced to state whether digital currency codes can be used for any specific transaction format. Amount formats (in the likes of SWIFT) may need to be extended to cater for currencies with large numbers of fractional parts (i.e Bitcoin has 8 so max Bitcoin transaction with all fractional parts would be 999,999.00000001	
	yes for digital asset trades: Overstock just has had its SEC approval for securities issues on a distributed ledger using digital currencies: http://investors.overstock.com/mobile.view?c=131091&v=202&d=3&id=aHR0cDovL2FwaS50ZW5rd2l6YXJkLmNvbS9maWxpbmcueG1sP2lwYWdlPTEwNjM1NDg4JkRTRVE9MCZTRVE9MCZTUURFU0M9U0VDVElPTl9FTlRJUkUmc3Vic2lkPTU3	
	Unclear at this time	
	Standards and rules for blockchain	
	Would be good to see more industry players making use of the work these guys did: https://cryptoconsortium.org/	
	Not sure. However, currently I only think bitcoin comes close to needing to be codified. All other digital currencies have not been proven enough to warrant inclusion get.	
	Impacts on other standards within digital currencies might be numerous and should be studied : ISO 20022 messages, ISO 8583 Financial transaction card originated messages - Interchange message specifications	
	not for the moment as far as we know	

	There should be a standard related to consumer protection when dealing with DC companies as well as an investigation into how existing standards e.g. ISO 20022 can best represent digital currencies and their activities and business processes.	
	I do not believe that the 3 letter ISO code registry is the correct place to register digital currencies (unless they are fiat-backed and expect a long life). A separate registry should be created for experimental digital currencies. Ideally, this registry would just use URLs and be decentralized. There should be standards related to: 1. Minting new digital currency identifiers (URLs). 2. A machine-readable registry for all ISO issued currencies, and digital currencies, that follows Internet/Web best practices (e.g. use of URLs to express currencies, machine-readable metadata associated with URL-based currency identifiers, etc.) I suggest engaging the W3C (specifically, the Web Payments Interest Group at W3C) for details on the proper way to design the technology for machine-readable interoperable registries as they have a good track record of doing this at an international scale.	
	No	
	As above BSI is currently engaging with the digital currency industry on creating a standard for consumer protection following a consultation by UK Government on regulating the industry. Issues raised here have included security, storage, terminology and wider. The intention would be for this standard to become globally applicable.	
	Whether other standards or procedures around cryptocurrencies or in banks need to be revised remains to be analyzed further	
	MIC?	
	- standards related to blockchain -	
	ISO standards for blockchain behavior would be interesting, but I'd worry that the technology is still evolving faster than the standard could keep up - it might be best to wait another year or so before embarking on that effort.	
	I think we might need some standards(or technical guides) how to generate and manage the blockchain and where we can use this and what is drawbacks.	
	Standards for the storage, transfer, and handing of blockchain assets is changing/evolving quickly. It is probably too soon for standards related to anything procedural, but it is appropriate now to have standards related to denomination, terminology, etc.	
	All ISO messages related to financial services must be reviewed.	
	I do not know of other existing standards that might need changing, but standards will be needed in order to provide standardization in regulatory reporting. For blockchain itself, a standardized "way to use" as a simple ledger, without the details of the blockchain mechanics, is probably needed right away as well.	
	Financial securities standards may be reviewed in order to use digital currency.	