

The RFID Revolution: Your voice on the Challenges,
Opportunities and Threats.

NCR's RESPONSES TO EU Commission RFID ONLINE CONSULTATION

September 2006

Section 1: Respondent details

This questionnaire is part of a public consultation exercise. It is subject to Personal Data Protection rules. Please read the [PRIVACY STATEMENT](#).

Question 1: Last name (optional)

Question 2: First name (optional)

Question 3: Gender (optional)

Female

Male

Question 4: e-mail address (compulsory)
mandatory question not answered

Question 5: What type of stakeholder are you? (compulsory)
mandatory question not answered

Interested citizen

RFID using Industry

International Organisation

Consumer Advocacy Group

RFID consulting Industry

Academic

Labour Organisation

RFID (systems) Industry

Telecommunications

Governmental Organisation

NGO

Other

Question 6: Please indicate your age group (optional)

Under 18


45 - 64

18 - 24

65+

25 - 44

Question 7: Your organization's country of establishment (indicate your country of residence if answering as an individual person) (compulsory)
mandatory question not answered

United States 

Question 8: Your organization's geographic area of activity (please indicate your geographic area of activity if answering as an individual person) (optional)

Local

National

International

Regional

European

Section 2: General Questions

As RFID technology moves swiftly from the research laboratory to mass applications in industry and government, it is generally recognized that it offers tremendous opportunities for business efficiency and economic competitiveness but also raises questions regarding the liberty of citizens and their fundamental rights. The European Commission wishes to assess how well informed consumers and citizens feel about RFID, and also the extent of their concern about potential risks associated with it.

Question 9: There is sufficient information available for interested citizens to come to an informed judgment of RFID pros and cons. Please tick the box that best reflects your view. (compulsory)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Strongly agree | <input type="checkbox"/> Disagree |
| <input type="checkbox"/> Agree | <input type="checkbox"/> Strongly disagree |
| <input type="checkbox"/> Neutral | <input type="checkbox"/> Don't know |

Question 10: The application of RFID offers great potential for improving the life of European citizens. Please tick the box that best reflects your view. (compulsory)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Strongly agree | <input type="checkbox"/> Disagree |
| <input type="checkbox"/> Agree | <input type="checkbox"/> Strongly disagree |
| <input type="checkbox"/> Neutral | <input type="checkbox"/> Don't know |

Response /comments:

It is NCR's views that RFID applications have already demonstrated that they can improve EU citizens life in many respects. This is just the beginning of long process given that RFID is an emerging (passive UHF RFID retail supply chain applications) and continuously evolving technology.

Among the most commonly known benefits one can list the followings:

- enhanced and efficient inventory, supply chain and asset tracking;
- highway toll passes;
- transportation cards;
- efficient after-sales services / warranty products management;
- faster food traceability;
- better customer service and growing satisfaction;
- improved products authenticity and defeat counterfeiting;
- etc...;

Question 11: A number of forums have developed guidelines on the protection of privacy and, specifically, criteria and standards for promoting respect for consumer privacy in the growing use of RFID technology in commercial applications. Such forums include the Organisation for Economic Cooperation and Development (OECD) and various institutions (ISO, EPCglobal, ETSI, CDT, etc.), most of which are open to participation. Are you aware of these efforts to develop "fair information principles" and RFID best practices? (compulsory)

- | | |
|---|-----------------------------|
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
|---|-----------------------------|

Response / comments:

As a provider of end-to-end RFID solutions, NCR is aware of the efforts developed by these forums and consider them extremely valuable and important to us. For instance, NCR has been involved from day 1 in all the work developed by EPC Global (Electronic Product Code) and NCR is one of its founding members. NCR is supportive of EPCglobal Guidelines aiming at providing clear information to consumers about the use of RFID technology and allowing them choice and regular information about privacy and security concerns. Equally, NCR is aware of the OECD privacy principles which were

initiated early in the 80's, and integrated these principles in its own Company Privacy policy. As a global player, NCR is following on a regular basis the work developed by standard organizations such as ISO, ETSI.

Question 12: Do you think that current European Union data protection and privacy legislation is adequate to deal with privacy and/or security concerns about RFID? If not, what do you think should be done (e.g., modification of existing law, self-regulation)? (optional)

Response / comments:

To date, the EU Data privacy framework as set for by Directives 95/46 and 2002/58 is probably one of the most complete and all-encompassing in the world. Firstly, its scope (offline & online environments) is already very broad and apply to all types of personal data processing activities regardless of the technology used. This latest aspect is certainly one of the key strength of the EU privacy framework which addresses all processing activities, while remaining 'technology neutral'.

Secondly, the existing framework is very broadly defined to encapsulate personal information and personally identifiable information and as such it does not require an 'update' simply because a new technology is about to flourish. The same rules apply now in all 25 Member states legislations since both directives have been finally implemented across all Europe. Adding an extra-layer of rules because of a new emerging technology would ultimately add complexities for economic operators to comply with, without necessarily improving consumers data protection nor meeting the current 'better regulation' benchmark criteria which should apply before any new piece of legislation is issued.

Lastly, adding new privacy rules at this point could create legal uncertainty for operators. Instead, what should continue to be the focus is to see current legal framework being properly enforced with consumers being in control of their data and controllers abiding by all their obligations as required.

Concerning security obligations, current Directive 95/46 already requires that the 'latest state of the art' of security measures are put in place and used when personal data is to be processed. At this point, we do not see any tangible need nor any rationale for additional privacy legislation on that particular aspect either.

Furthermore, we would like to underscore that given current use of the technology, the vast majority of RFID uses fall already outside the scope of Directive 95/46, since they will NOT result in the processing of personal data (identified or identifiable) within the meaning of the Directive. To date, most of operational RFID projects involve the use of RFID-tags in the supply chain, but are applied on containers, pallets and boxes, not on an item level. Items-level tagging of products for sales in retail stores are at least five years ahead, so consumers will not face RFID technology tomorrow.

By contrast, to date there are many daily applications (contactless smart cards for payment, or employees access or shops, etc...) which are processing personal information (identified and identifiable) and which have not proved to be problematic or to demonstrate any serious limit of the current legal privacy framework.

It is therefore important to differentiate the type of applications that include or process personal information and those that do not, before any policy conclusions are hatively made and which in turn could hamper the take-off of this new promising technology.

Section 3: RFID Use

RFID fits within a wide range of wireless technologies that allow for the "Internet of Things", but in itself also offers applications that differ according to reading range and frequency used. Specific applications determine what kind of data will be needed, at what range the tags should be scanned, how the data will be protected, and whether there are any concerns like privacy, interoperability and spectrum interference. Therefore, concerns cannot be generally addressed for RFID technology as a whole; they should be focused on the specific application in which RFID technologies are used. The European Commission is interested in your analysis of vulnerabilities of different applications, functionalities and fields. For further information please see Chapter "RFID

application domains and emerging trends" on p. 6-12 of the background document "Your Voice on RFID".

Question 13: Do you consider that the European Commission should stimulate the implementation of RFID technology in the following application areas (please select your top three or tick last answer): (compulsory)

- | | |
|--|---|
| <input checked="" type="checkbox"/> Healthcare | <input type="checkbox"/> Lifestyle and Leisure (skiing, ticketing, museums) |
| <input type="checkbox"/> Pharmaceuticals | <input checked="" type="checkbox"/> Retail |
| <input type="checkbox"/> Agriculture | <input type="checkbox"/> Public Transport |
| <input type="checkbox"/> Government - Asset management | <input type="checkbox"/> Logistics & Goods Transport |
| <input type="checkbox"/> Government - immigration/border control/customs | <input checked="" type="checkbox"/> Supply Chain Management |
| <input type="checkbox"/> Government - Defence and National Security | <input type="checkbox"/> Manufacturing and Processing |
| <input type="checkbox"/> Government - Hazardous Materials Management | <input type="checkbox"/> The European Commission should not stimulate the take-up |
| <input type="checkbox"/> Library Systems | |

Response / comments:

It is NCR's view that the EU Commission should stimulate the take-off of RFID technology in any applications by ensuring that a right balance is struck between the following key parameters: policy, R & D, investment and innovation. It is also NCR's view that the EU Commission should foster the development and use of RFID technology within the public sphere in adopting adequate measures to encourage the early adoption of RFID within Government sectors (see above) since RFID technology can truly benefit to citizens at large.

Question 14: In healthcare environments (hospitals, elderly care and home care institutions), there is evidence showing that some processes are not always running effectively (wrong medication or treatments, missing surgical equipment, inadequate disinfection...). The European Commission should promote the use of RFID-based solutions in such environments in order to increase patient safety and potentially reduce costs (thanks to improved logistics and management). Please tick the box that best reflects your view: (compulsory)

- | | |
|---|---|
| <input checked="" type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neutral | <input type="radio"/> Don't know |

Question 15: Do you think that the European Commission should encourage the use of RFID technology for the purpose of identification and tracing in the following areas: (you can tick more than one option) (compulsory)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Light weapons and other dangerous products? | <input checked="" type="checkbox"/> Electronic Vehicle Identification? |
| <input checked="" type="checkbox"/> Pharmaceutical products (to reduce the risk of counterfeit)? | <input type="checkbox"/> None of the above? |
| <input checked="" type="checkbox"/> Products that require a high reliability (e.g., airplane spare parts)? | <input type="checkbox"/> Don't know |
| <input checked="" type="checkbox"/> Food safety? | |

Question 16: Do you think harmonization of one or more of the following areas should be pursued through concerted efforts at European level? (optional)

- | | |
|---|--|
| <input type="checkbox"/> The identification and tracking requirements of pharmaceutical products in different EU Member States? | <input type="checkbox"/> Toll collection systems? |
| <input type="checkbox"/> Transportation ticketing solutions (train, metro, bus)? | <input type="checkbox"/> Interoperable electronic number plates that can be used in, for instance, theft preventing systems? |
| <input type="checkbox"/> Intermodal transport systems, container and shipment tracking systems? | |

Response / comments:

Before pursuing harmonization objectives, it is important to understand the current level of deployment and maturity of RFID technology.

Today, most RFID projects undertaken by the market at large, involve the use of RFID-tags in the supply chain, but do not involve mass deployment of the technology for instance at item-level in retail environments. At this point it is expected that the widespread use of RFID technology at this level is still 5 years away.

Therefore, we would like to see the EU Commission promoting the adoption of RFID as opposed to focus on business applications at this stage. Equally, we believe that there is no need for harmonization which is required at this stage, at least until RFID technology will be used at a broader scale.

Question 17: Counterfeiting today accounts for 10% of world trade, affects all economic sectors (pharmaceuticals, luxury goods, mechanical products, textiles, etc.), and results in the loss of 200,000 jobs per year in Europe. The World Health Organisation (WHO) estimates that counterfeit drugs account for 8 to 10% of all pharmaceuticals. Do you think that the European Commission should encourage Member States to define a legal, technical and organisational framework dedicated to the prevention and dissuasion of counterfeiting? If yes, please specify how this goal could be achieved. (optional)

Response / comments :

The scale of counterfeiting, its change in nature and with it, its unprecedented economic impact on all operators, should encourage the EU Commission to work closely with Member states and other international trade partners to set up a strong legal framework to defeat counterfeiting.

Some possible technical, legal and organizational measures to explore could include the following considerations:

- encourage the use of RFID technology as an advance tool to enhance counterfeit detection;
- provide training to customs, police authorities on how to use these tracking tools;
- improve the quality of information and data provided to customs authorities and encourage the use of modern ICT technologies to enhance such capabilities;
- put customs authorities at the core of the process and improve the quality of information which is provided;
- extend their competences in relation to seizure & destruction of counterfeited goods and simplify procedures within the EU;
- sharpen common enforcement procedures across Europe;
- expand joint border enforcement actions and cooperation for common enforcement operations with key trading partners from third countries (China, India, Russia);
- develop external cooperation for police & custom authorities and foster external partnerships with other international trade organizations and trade partners.

Section 4: Security, Privacy and Data Protection, and Safety

The workshops organized by the European Commission in 2006 have highlighted the fact that as RFID becomes increasingly ubiquitous - pervading the commercial, governmental and private arenas - with potential impact on privacy. Although a number of RFID applications are seen as not raising privacy concerns, when the data collected from RFID tags is linked to personally identifiable information, privacy issues do arise. Citizens are entitled to know what happens with data that are transferred from an RFID tag to a reader: how do we know for sure that the data reading is correct, that the data are not tampered with, that someone who is not entitled to read the data does not actually read it?

Besides the legal aspects, the workshops have also pointed out the societal issues about the safety of RFID devices and about the consequences of RFID use on labour practices.

For further information please see Chapter "RFID security, data protection, privacy, health and safety issues" p. 13-19 of the background document "Your Voice on RFID".

Question 18: What in your opinion would be the best solution(s) to eliminate or greatly reduce the security, data protection and privacy concerns that may arise from deploying applications of RFID technology? (you can tick more than one option) (optional)

- | | |
|---|---|
| <input type="checkbox"/> To enact legislation regulating RFID | <input type="checkbox"/> To foster the development of technical solutions allowing to disable RFID tags |
| <input type="checkbox"/> To rely on self regulation and best practices based on the fair information principles | <input type="checkbox"/> To raise the awareness of consumers through educational campaigns |

Response / comments:

Before answering a question related to the potential impact of RFID technology (tags) on privacy, it is essential to acknowledge that RFID technology is an evolving technology with key differences between the various types of RFID tags, their typical applications, their respective capabilities and their limitations. It is equally important to conduct -prior any conclusions are drawn- a realistic assessment of current technology uses and to have such assessment based on reasonable business scenario, not on futuristic speculations.

Once this is clarified, then only respective privacy and security impact assessments of RFID technologies -should personal data being involved- can be determined with more legal certainty so to prevent any wrong policy answers or detrimental initiatives to be taken and which may hamper the full realization of this promising technology.

Broadly speaking, RFID-tags can be divided into three categories, passive tags, contactless smart cards and Electronic Product Code (EPC) technology, each of them requiring different security configurations as well as processing information models.

While assessing whether the current privacy framework is sufficient or not in itself given its broad scope, any policy response must be balanced to consider the effective security risks or privacy breaches which may arise from these different RFID technologies and be technology neutral in order not to restrict the future development of new RFID technology applications.

Based on the above and given the evolving development of RFID technology, we believe that:

- the current all-encompassing EU privacy framework is sufficient to cover potential privacy or security breaches issues;
- issuing RFID technology specific privacy rules would not bring any direct benefit to consumers at this point;
- emphasis should be put instead on enforcing existing broad EU privacy rules;

- consumer education programs so to remove RFID technology myths and misconceptions should be given priority;
- development of best practices and sharing of information principles with consumers could add some value as this could have both an educational and an awareness role and contribute to building consumers trust and getting RFID technologies better accepted.

Question 19: If you are in a supermarket, would you prefer a RFID tag related to a product to be: (you can tick more than one option) (optional)

- | | |
|--|--|
| <input type="checkbox"/> A removable sticker attached to the product itself? | <input type="checkbox"/> Part of the product's package box? |
| <input type="checkbox"/> Automatically de-activated at the point of sale? | <input type="checkbox"/> A proximity tag with a very short reading distance of less than 5 cm? |

Response / comments:

It is NCR's view that this question requires some further clarifications before any useful answer can be provided. Firstly, the widespread use of item-level tagging as it seems to be implied in the question above is years away in the Retail sector.

Secondly, not all RFID-tags used in the Retail sector contain personal information as it seems to be suggested above. Therefore, the question of their removal or their de-activation should not be considered as the default alternative since these tags do not necessarily store personal information or personal identifiable information.

Thirdly, in instances where such RFID-tags contains personal information, it may be useful to put into prospective as well the tangible benefits this could bring to consumers, should the tags remain activated, such as warranty, repair, authentication enhancement and anti-counterfeiting, etc... , before suggesting that de-activation should become the standard.

Furthermore, legitimate businesses deploying RFID technologies -if processing personal information- are offering choice to their customers. Equally they are respecting notice, security requirements and are seeking data subject's consent as required for. Indeed, proper information and choice should be offered *de facto* so that consumers can opt for what is the most suitable alternative to them. This follows the principles as provided for in the EPCglobal's Guidelines and offered as well within the 'kill command' function and therefore one should refrain from imposing a 'one size fits all' approach for RFID-tags at this stage, nor any additional privacy rules.

Finally, although it is envisioned that tags will be generally affixed on packaging, it may be sometime impossible and some RFID-tags will have to be affixed on the product itself, and therefore this aspect should not be subject to any mandatory rules *in abstracto* at this stage.

It is NCR's view that the policy responses to be issued by the Commission should strike the right balance and do not impede at this stage, legitimate businesses to continue deploying and use responsibly RFID technologies.

Question 20: Which maximum reading distance in your opinion could be considered as acceptable for "proximity tags" (i.e. tags which may be read only at short range - less than a few inches or centimeters)? Please specify the application domain (e.g., product tagging) and provide options for maximum reading distance (1cm, 5cm, 10cm, 25cm, 50cm, etc.) (optional)

Response / comments:

It is NCR's view that this question requires some further clarifications since it may lead to some wrong conclusions, the most obvious one being that one may consider that the shortest distance might automatically reduce risks or possible breaches.

This is in fact just reflecting a truncated vision of the whole RFID functionalities.

In practice, the reading distance of a RFID-tag depends on the specific needs set for it, such as the products which have been tagged, the frequency of the tag, etc... and on the application as well as on the network capabilities supporting such application.

Therefore, given the evolving nature of the technology and the diverging nature of applications, it is not sound to have maximum or average reading distances being defined by policy measures as this could prove soon to be obsolete and counterproductive.

As for all many questions raised about RFID technology, it is our strong belief that responsible uses should be promoted instead of dictating by law which technical features should be used.

Question 21: How in your opinion should the RFID application provider treat security, data protection and privacy issues? (you can tick more than one option) (compulsory)

- | | |
|--|---|
| <input type="checkbox"/> Conduct a risk assessment prior to the technology deployment | <input type="checkbox"/> Leave these issues to the end-users |
| <input type="checkbox"/> Select RFID systems that provide appropriate security and privacy mechanisms | <input type="checkbox"/> There is no need to address these issues |
| <input type="checkbox"/> Manage security and privacy properly throughout the whole RFID-enabled business process | |

Response / comments:

It is NCR's view that most of the options for answers provided above are complementary and could be all selected. As for the deployment of ICT solutions in general or for any systems processing personal information, any responsible business or deployer would conduct before hands, a full project assessment and risk review prior selecting any provider and/or deploying any technical solution. The same would apply when deploying in a responsible manner, any RFID solution which has capabilities to process personal information.

At this point, it should be emphasized again that existing EU privacy rules already require that specific privacy principles and security requirements must be respected in all instances by any deployer / data controller and must apply throughout the entire process when deploying any system processing personal information.

Most relevant requirements applicable to deployer / controller include the following aspects:

- information requirements, such as right of access, right to correct, to erase,
- notice;
- choice;
- accountability;
- consent;
- security;

As indicated, the above requirements are already implemented in all Member states laws and apply to any RFID deployer /controller, as part of his compliance obligations when deploying a RFID solution which processes personal information. We do firmly believe that complying with privacy and security requirements as set for by Directive 95/46 are part of any EU data deployer /controller compliance obligations and for them to implement. Technology providers can provide the tools and being an enabler, but it is up to RFID deployer /controller to apply and or use them accordingly. As soon as there is a processing activity with personal information, the EU Directive 95/46 applies regardless of the type of technology at stake, i.e. being a new emerging one or not, and this includes RFID.

Finally, taking a different approach for RFID systems when processing personal information would put at risk one the fundamental governing principle which is -and must continue to be enshrined in all EU regulations-, i.e. technology neutrality.

Question 22: RFID can be used for employee tracking, typically by attaching RFID tags to name badges or security passes. Data capture from RFID tags may sometimes be integrated with personnel files (e.g., linked to employee time sheets, pay records, or health records), thus modifying the traditional balance of personal convenience, workplace safety and security, and individual privacy. In accordance with the current EU laws, employees should always be made aware that personal data is being collected and of how it is used and distributed. Do you feel concerned about the extent of the right of employers to undertake RFID-enabled monitoring of their workforce? (Please tick the box that best reflects your view) (compulsory)

Very strongly

Not very strongly

Fairly strongly

Don't know

Response / comments:

The use of contactless smart cards or RFID-tags in the workplace is one of the most commonly used application today and deployed to identify employees, securely authenticate and authorize their access to buildings or working premises. While these types of applications carry personal data in their memory, they are always used in a controlled-environment and can only operate within that said domain and under the employer's authority.

As for other processing activities using personal information, the use of RFID-tags in the workplace is not deployed in a legal vacuum or without any legal safeguards.

Firstly, employers using RFID applications in the workplace are bound by all provisions set for by Directive 95/46 and its fundamentals principles (see above), such as: prior information, notice to employees, information about the purpose of a processing, access to the data retained, security measures against loss, misuse, unauthorized access, etc ..., apply in full.

Secondly, these data processing activities pursued by employers are taking place in the course of the performance of a contract with employees and are necessary for the legitimate interest pursued by employers, i.e. management of a working contract, and therefore are lawful and legitimate.

Thirdly, the use of RFID applications by employers does not change the nature of their privacy compliance obligations, and as controllers of data processing activities they are bound by the same

rules and any abuses of the privacy rules are subject to penalties as provided for in national implementing measures.

Question 23: Do you think that privacy enhancing technologies in RFID applications should: (optional)

- be promoted at European level? be left to the market?
- be made mandatory (e.g., "privacy by design" rule)?

Response / comments:

It is NCR's view that Privacy enhancing technologies (PETs) may provide some additional reassurance to consumers when facing RFID applications. However, since this type of measures could have a direct impact on the technology itself, we believe that making PETs mandatory at this stage could hamper the crucial principle of technology neutrality which should prevail in all instances.

Instead, we do strongly believe that PETs efforts should be driven exclusively by the market and should remain as such an important competitive differentiator. We do believe as well, that technology can be a privacy enabler but in no cases it can be considered as a substitute nor replace deployer / controller obligations which remain crucial, and must be part of any consistent and transparent company privacy compliance program.

However, we believe that there is some potential benefit for PETs support and promotion at EU level to leverage public funding in order to bring together research and development capabilities at a Regional level. In that respect, we believe that efforts could be pursued by the EU Commission, particularly under the umbrella of the EU R&D 7th Framework.

Question 24: How do you think the end-user should be informed that RFID applications are being used? (compulsory)

- Notification by the RFID user (e.g., labels for compliance with best practices or independently set standards) Notification under third party certification (e.g., labels for compliance with best practices or independently set standards)

Response / comments:

Firstly, it is NCR's view that a clearer definition of what is intended by 'end user' should be provided so to avoid misinterpretations. If an end user is to be the final consumer, then it is NCR's view that consumers have legitimately the right to know, the right to be informed and to be offered a choice. These are fundamental rules provide by Directive 95/46 and should apply in all instances when RFID technology is deployed.

Secondly, this approach follows the EPCglobal's Guidelines which are built on industry responsibility, information, notice and choice. NCR believes that providing the ability for RFID deployers / users to notify their end-users, i.e. their customers about RFID applications should be allowed and be supported along the EPCglobal model. The latest should be supported and encouraged and be considered as a good vehicle to help using / sharing best practices in the retail environment.

Lastly, we believe that third-party certification schemes should not be considered as an option at this point. Indeed, such certification could become rapidly burdensome for businesses and deployers, add extra-costs, discourage the use of this promising technology and without necessarily proving to bring any immediate and direct benefit to end-users / consumers.

Section 5: Standardisation and Interoperability

Interoperability enables broader deployment of technologies across organisational and sectoral boundaries. In order to achieve interoperability, and thus facilitate wider deployment of technologies, a certain level of standardisation is required. Specifically, as RFID is reaching new stages of maturity and pervasiveness, the issues of standardisation and interoperability must be addressed, as well as the need for intervention by the European Commission in order to be better able to achieve the objectives of a more open, dynamic and competitive Europe. For further information please see Chapter "Interoperability, standardisation, governance and Intellectual Property Rights" p. 20-22 of the background document "Your Voice on RFID".

Question 25: Do you think that the European Commission should stimulate and support initiatives that lead to global harmonisation of RFID standards? Please tick the box that best reflects your view (compulsory)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Strongly agree | <input type="checkbox"/> Disagree |
| <input checked="" type="checkbox"/> Agree | <input type="checkbox"/> Strongly disagree |
| <input type="checkbox"/> Neutral | <input type="checkbox"/> Don't know |

Response / comments:

Interoperability and spectrum are in our view the most urgent priorities which should be addressed by the European Commission so to maximize the use of RFID technology at a broader scale and to see its benefits impacting favorably European competitiveness.

Indeed, it is essential that tags used in one country can be read in others and that all players in the supply chain can read, interpret, process and use all the product information stored on each RFID-tag.

To this end, it is therefore essential that good progress is made and support is provided with standard decisions to happen at both regional and international levels with instances such as ETSI or ISO.

Any support or interaction in this space should aim at facilitating and fostering rapid and transparent adoption of standards and should not have as a consequence to add an extra layer nor any more complexity before a decision can be adopted.

Question 26: Do you think that the European Commission should take a more active role in setting RFID standards? (optional)

- | | |
|---|-----------------------------|
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
|---|-----------------------------|

See above response / comments under n° 25 for interoperability and spectrum.

Question 27: If yes, would you say that the European Commission should: (optional)

- | | |
|--|---|
| <input checked="" type="checkbox"/> bring together stakeholders in standard setting activities? | <input type="checkbox"/> support the development of certification services? |
| <input type="checkbox"/> mandate standards? | <input type="checkbox"/> assess whether standards are in compliance with European cultures and values (e.g., privacy and data protection, small or medium-sized enterprise requirements)? |
| <input type="checkbox"/> align European Union standards with those of other regions of the world | |

See above response / comments under n° 25.

In addition, the EU Commission could play a role in bringing together stakeholders in standard setting activities as long as it does not add more complexities to the process and take into proper consideration the clear business demand and it remains a transparent initiative.

Given the importance of market players in this process and market adoption in this space, it is NCR's view that there should be no mandate nor imposed standards at this point.

Question 28: The small size of the tags implies that it is difficult to display regulatory information on them (this includes - but is not only specific to - spectrum regulation). Regarding in particular the R&TTE Directive requirements, do you think that mechanisms using the CE mark, or its principle, could be adequate? Please specify. (optional)

Response / comments:

From our consideration of the regulatory requirements for RFID tags, we believe that it would be more appropriate for any regulatory requirements to be applied to the reading equipment rather than to the tags themselves. The following comments below provide background to this opinion.

Tags used for RFID applications are indeed of small size and most generally made of materials such as paper, copper, plastic (for rigid tags) which are not capable of initiating any action of their own, nor create any hazard, so regulatory information to be displayed should be limited to existing requirements.

Concerning marking, the CE Marking Directive provides that it is possible for the mark to be affixed to the packaging itself when necessary, so this should not be considered as an issue here for tags.

However at this point, there is no sense to request for RFID tags to be marked as they are passive components, i.e. they do not contain any power source in itself.

Instead, it should be considered marking the reader equipment for the tag. In doing so, one would be showing compliance with the R&TTE directive.

Section 6: Frequency Spectrum

Radio spectrum is by nature an essential enabler of RFID applications. It is therefore critical that adequate spectrum be available in due time and under appropriate quantity and regulatory conditions in order not to hamper developments in this fast-developing market area. One of the important aspects to keep in mind is that the regulatory procedures available to allocate radio spectrum follow traditionally long life cycles and require normally anticipating the needs several years in advance. Hence, the importance to understand the user needs and the future timing of these needs as reliably as possible. The focus is currently on Ultra High Frequency (UHF) frequencies because it is the spectrum used by the latest generation of mass market RFID tags to be deployed in logistics and retail distribution. However, other technologies might soon push regulatory frontiers even further (e.g., Ultra Wide Band).

For further information please see Chapter "Frequency spectrum requirements and recommendations" on p. 23-25 of the background document "Your Voice on RFID".

Question 29: The European Commission has proposed an EC Decision on UHF spectrum harmonisation for RFIDs (865 - 868 MHz) in order to accelerate the establishment of a fully functioning internal market for these devices and to provide legal certainty throughout the European Union. This proposed EC Decision should be applied into national law by the respective Member States by the end of 2006. Do you believe this regulatory action is sufficient to provide a favourable environment for the initial deployment of UHF RFIDs? (optional)



Yes



No

Response / comments:

It is NCR's view that this proposed 2006 EC Decision is a first step in the right direction for supporting the adaptation of UHF frequency plans which are much needed for a faster development of RFID technology as already recommended by the European CEPT (Conference of Postal and Telecommunications Administrations) in its most recent decisions in 2004 and 2005.

This decision to apply UHF harmonization should be enforced by all Member states at the earliest opportunity. This would facilitate favorable conditions for some UHF RFID applications and will allow end-users to focus on these early adoption applications (e.g. reading of 'smart labels' in a controlled dock door scenario, security access where prescribed processes are already enforced).

In addition, in order to encourage investment and create a more predictable environment for RFID investors, such measures should be supplemented in the near future by further commitments to allocate larger spectrum and consider adoption of measures improving spectrum utilization.

Question 30: If yes, how long do you think can industry reasonably operate within the limitation of the 3 MHz set across the European Union for RFID UHF bandwidth (of which 2 MHz can be used at power level up to 2 watts) without congestion? Please tick the box that best reflects your view. (optional)



Less than 3 years



Between 3 and 5 years



Between 5 and 10 years

Response / comments:

We do believe that the adoption of the above decision will probably allow for worthwhile applications for the next 1-3 years.

However, it is NCR's view that more bandwidth will be required thereafter to enable easier 'anti-collision' reading of the proliferating number of tags.

Question 31: It is likely that additional UHF spectrum will be needed as UHF RFID technology will mature and become virtually ubiquitous in the whole society. Do you agree that this prospect is not so remote? (optional)



Yes



No

Question 32: If yes, when do you think we would run out of the currently allocated spectrum? What could be the best candidate spectrum bands for an extension? What is the level of global compatibility/co-ordination that would be required? (optional)

Response / comments for questions 31 & 32:

It is NCR's view that the future allocation of sufficient spectrum is a prerequisite for the rapid development of RFID technologies in a sound and reliable investment environment for businesses in Europe.

Already today, some congestion situations have a negative impacts on short term investments in Europe.

Additional UHF spectrum will be needed to accommodate the 'anti-collision' reading of tagged items (minimally at case level, but consumers unit for high value goods) moving at speed through the supply chain. If major end- users would deliver on their expansion plans, this would be a very clear prospect in the next 1-2 years.

The growth of secure global 'track and trace' requirements will also dictate further expansion needs.

It is therefore vital that spectrum expansion is done in a coordinated and global basis precisely for this reason, with compatibility a worthy if not easily a realisable objective.

Expansion in the 860-950 MHz bandwidth is the most favourable from a radio performance and legacy perspective.

We believe, ideally, the the European Union needs to converge with global spectrum allocations to achieve a good level of compatibility and coordination for an efficient deployment of RFID technologies.

Question 33: Whenever long term spectrum needs cannot be identified using straightforward methods, an alternative would be to start by a macro economic and societal impact assessment of the underlying applications and then to derive indirectly the associated spectrum requirements. How in your opinion could such macro economic and societal impact assessment be done? Please tick the box that best reflects your view. (optional)



Study



Research project



Industrial co-operation



A combination of the three options above

Response:

Any move towards further spectrum harmonization needs to be fully researched through a variety of research and development channels. The overarching rationale for future developments must focus on the enhanced competitive and economic benefits that EU companies would accrue from improved technology (cost & performance). The European Union should be encouraged to provide 'pump-priming' funding into practical, industry-bases research into direct value (measured by societal/consumer/supply chain benefits) and enhanced technology performance that further spectrum liberalization could bring.

It is NCR's view that this must happen no later than the next 1 to 3 years to see the promising benefits of RFID technology to flourish in Europe.

Section 7: Research

It is expected that in the future RFID will be integrated with network and positioning technologies as well as other technologies offering sensory and security capabilities. These developments create both challenges and opportunities for European researchers in the forthcoming 7th Framework Programme for research and technological development.

For further information please see Chapter "From RFID to the Internet of Things" on p. 26-29 of the background document "Your Voice on RFID".

Question 34: Research and Development in the RFID field covers the elementary technological blocks needed to create the "smart tags" of the future and system integration and delivery of "end-to-end systems". Which in your opinion are the research topics which the European Commission should support in priority? Please select up to 3 options (optional)

- | | |
|--|--|
| <input type="checkbox"/> Organic electronics and organic RFID devices | <input checked="" type="checkbox"/> The use of RFID and other identification technologies to provide enterprises with the ability to sense events and to respond in the most adapted manner to their competitive environment thanks to near real-time information and adapted supply chain processes |
| <input checked="" type="checkbox"/> The integration of smart sensors and actuators with RFID devices | <input checked="" type="checkbox"/> Innovative applications and services such as the use of RFID technology to make road transport safer, to help blind and impaired people on streets and in shops, to enhance the efficiency of logistics and business processes... |
| <input type="checkbox"/> The removal of the technological hurdles of the existing silicon based RFID generation | <input type="checkbox"/> Privacy enhancing technologies such as encryption and authentication |
| <input type="checkbox"/> New systems of item identification to connect every day objects and devices to large databases and networks and to the Internet | |

Question 35: The European Commission should support SMEs by investing in awareness raising campaigns, in establishing vendor independent competence and training centres, and/or in promoting the development of RFID applications based on identified best practices (optional)

- | | |
|---|---|
| <input checked="" type="radio"/> Strongly agree | <input type="radio"/> Disagree |
| <input type="radio"/> Agree | <input type="radio"/> Strongly disagree |
| <input type="radio"/> Neutral | <input type="radio"/> Don't know |

Response / comments:

It is NCR's view that it will take years or even decades before the "Internet of things" -as it is suggested above- will become a reality. Indeed, the widespread use of RFID data with applications via Internet is just a projection of what the potential could be.

It should be emphasized however that the vast majority of RFID applications remain predominantly within the supply chain and retail environments which therefore implies no such Internet data personalization in the foreseeable future. Even then, the availability of data to consumers (either at point of purchase or remotely via Internet) is somewhat academic and will have to be determined through retailer consensus.

Question 36: In the future, technology is expected to allow consumers and citizens to look up on the Internet additional information by entering the RFID number affixed to the product bought (e.g., for warranty purposes, further product and production information, maintenance information). When

such an "Internet of Things" comes into widespread use, its governance model should be built on transparent, fair and non discriminatory international principles, free of commercial interest (optional)

Strongly agree

Disagree

Agree

Strongly disagree

Neutral

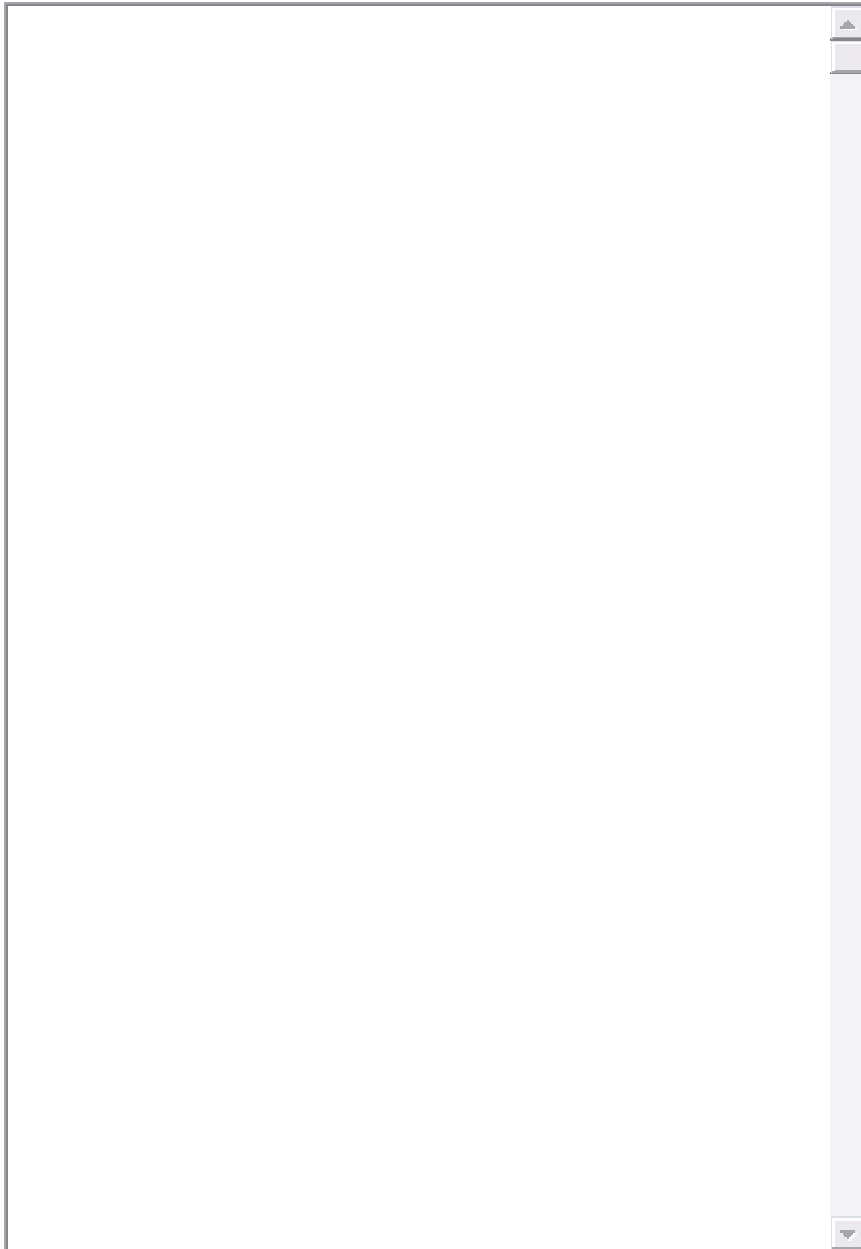
Don't know

Response / comments:

It is NCR's view that it will take years or even decades before the "Internet of things" -as it is suggested above- will become a reality.

Indeed, the widespread use of RFID data with applications via Internet is just a projection of what the potential could be. It should be emphasized however that the vast majority of RFID applications remain predominantly within the supply chain and retail environments which therefore implies no such Internet data personalization in the foreseeable future. Even then, the availability of data to consumers will be determined through retailer consensus.

Question 37: Do you have comments on any other aspects which are not covered in the above questions and which you consider to be important? (Please note that such comments should be limited to issues which relate directly to RFID systems) (optional)



Question 38: How did you perceive this questionnaire? (optional)

- Expectations met Expectations not met

Question 39: Expectations not met: (optional)

- Too general Irrelevant in content
 Too short Too difficult to understand
 Too long Too technical