

SUPPORTING JUSTIFICATION – Part A
Information and Communications Technology Needs Assessment
OMB Control Number 2130-NEW

Summary of Submission:

- This information collection request is a new submission. The proposed assessment is intended to create a better understanding of information and communications technology (ICT) needs of and uses for specific railroad audiences.
- The estimated total number of burden hours requested for this submission is 511 hours.
- The estimated total number of responses requested for this submission is 1,533.
- The required 60 Day Federal Register Notice was published in the Federal Register on April 18, 2017, See 82 FR 18341. FRA received no comments in response to this notice.

A. Justification

- 1) *Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating and authorizing the collection of information.*

Volpe, the National Transportation Systems Center (Volpe), on behalf of the Federal Railroad Administration's Office of Research, Development and Technology (FRA RD&T), is seeking the approval from the Office of Management and Budget (OMB) to conduct a needs assessment that will provide information regarding the use of information and communications technology by the railroading worker population. FRA RD&T periodically conducts such context assessments of the social, legal, and policy barriers related to its mission. For the purpose of this study, information and communications technology is defined as technology and tools that people use to share, distribute, and gather information, and to communicate with one another, one on one, or in groups. The FRA utilizes information and communications technology (ICT) to disseminate research findings and to increase awareness of safety education programs and other RD&T-sponsored innovation projects. The data gathered in this study will support the FRA and DOT in attaining the strategic goal of improving safety in transportation (FRA, 2013), by providing information that will improve and inform their strategic communication dissemination efforts such that they can reach the railroading population more efficiently and successfully.

The proposed study is a needs assessment (Scriven & Roth, 1990) designed to understand the current state of railroading industry use and application of ICT. As such, this study asks broad questions about ICT. The information is intended to be useful in designing efforts at using ICT for FRA RD&T purposes. The main objectives in this study are to determine how Transportation, Yard and Engineer (TY&E) railroaders use ICT, identify ways to reach this population with future ICT-based education and communication efforts, and develop baseline awareness data on a FRA RD&T program.

While printed outreach and educational materials still have a use across many domains, the extent and ways that electronic information and communications technologies are being used to communicate is rapidly growing. With more options available to consume information, it is necessary to understand if our current efforts are working and to identify the best ways to reach railroaders.

This needs assessment will be guided by these four research questions:

- a) How much do TY&E railroaders use ICT?

Given the increasing integration of personal ICT tools into daily life (e.g., the census now includes sections on ICT) and the proliferation of personal ICT tools that are not necessarily tethered to the home (e.g., mobile phones and tablets), the use of ICT has become an important industry condition to monitor. Answers to this question will inform our understanding of ICT application and guide efforts to reach this audience. For instance, the Switching Operations Fatality Analysis (SOFA) Working Group (SWG) and the *Railroaders' Guide to Healthy Sleep* website are two examples of FRA RD&T cross-industry projects that have a need and would utilize railroader ICT access and use information to focus their communication and dissemination efforts.

User skills data can also inform these efforts. For instance, online training is increasingly using interactive learning and testing tools. The modern ICT “digital native” (those who are very comfortable in the ICT world) would find these tools relatively easy to manage, while other “digital immigrants” (those slow to adopt technology) may be less comfortable with these tools. Armed with the knowledge of railroader ICT skills, trainers and others can deliver information through media and tools appropriate to their audience.

- b) For what reasons do TY&E railroaders use various ICTs?

There are many avenues of information dissemination and sharing. Railroader usage of specific ICTs can provide clear dissemination points. Railroaders may be uncomfortable using a variety of ICTs or they may be unfamiliar with particular technologies. This lack of awareness of specific ICTs could be critical if a lot of railroaders, for example, do not know what a blog is—particularly if FRA RD&T programs are considering investing significant resources in blogging.

- c) What are TY&E railroader attitudes towards ICTs?

Attitude towards ICTs is an important predictor for use and acceptance (Spence, DeYoung, & Feng, 2009). Much of the research on ICT use shows that those with positive attitudes are more innovative and have a higher perception of the relative advantage (see Verdegem & De Marez, 2011, for a review of ICT research). While this is particularly important for designing future communication campaigns that encourage the use of, or directly utilize ICT, gaining clear understanding of TY&E railroader attitudes also sets a baseline for defining the industry’s attitudes towards ICT.

- d) How knowledgeable are TY&E railroaders about a FRA-RD&T project?

This question is intended to provide a baseline knowledge of the FRA RD&T *Railroaders' Guide to Health Sleep* initiative against which future communication campaigns can be

measured. Armed with empirical understanding of participants' familiarity with this program, and the avenues they use to gather information, administrators will be better positioned to design outreach campaigns to reach intended constituents.

As organizations (i.e., government and private) rely more and more on information and communications technologies, knowledge about the intended users becomes critically important. Program managers, who are informed of intended user needs, are better able to tailor program resources and efforts to meet those audiences' needs. This research trend is evident in numerous efforts: a) the U.S. Postal Service (2013) deploys an annual diary study to understand the citizenry's attitudes and use of postal and other forms of communication so that they can best serve the consumer; b) the U.S. Census Bureau includes a section on Internet and broadband access in its population survey (File & Ryan, 2014) and provides this information free to the public; and c) the National Telecommunications and Information Administration is using these and other data to actively implement the Administration's broadband access-enhancing agenda (NTIA, 2013). While inadequate in meeting the information needs of this project, these efforts substantiate the need to continue to understand the application and adoption of ICT.

2) *Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.*

FRA will report on this information in a written format, provide the cleaned data to www.data.gov, and use the data to inform internal program development where ICT application or use is a potential factor. Previous studies (e.g., *OMB 2130-0588*; *OMB 2130-0570*) have provided some valuable information on railroader demographics, but there is no comprehensive resource that tracks the industry demographic trends. When developing RD&T programs for the rail industry, recommendations that relate to the industry demographics are based on limited studies. These previous research studies, while important for their intent, have not been repeated and therefore, have only one-time use value. New data that can be used to validate or challenge previous studies and supply a means to reliably gauge data trends will provide an important new tool. It will strengthen the industry's ability to describe itself.

When applicable, this survey uses adapted questions from the US Census Bureau's Current Population Survey's section on computer and Internet use so that the study findings are informed by existing research. This study will also serve the public good by providing an understanding of the ICT use profile of railroaders, a status check for this sub-population's fulfillment of the National Broadband Plan (www.broadband.gov), and an indication of the railroad industry's degree of adoption of the digital society compared to a continued reliance on printed materials.

The railroad industry has many groups of workers, from managers, to line and yard workers. There are also different environments, such as passenger and freight. The one common intersection that reaches the largest population of workers is the trainmen and enginemen who are members of large union organizations. The International Association of Sheet Metal, Air, Rail and Transportation Workers, Transportation Division (SMART-TD) and Brotherhood of Locomotive Engineers and Trainmen (BLET) represent most of the TY&E workers. Therefore, this research will focus on these groups of workers to inform our understanding of the railroad worker industry.

The findings of this study will provide baseline measures for monitoring the industry's experience with the digital domain and provide valuable insight for program development across a variety of endeavors. In this regard, the study should support policy focus and decision-making with regard to reaching the industry's diverse population.

- 3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.*

The primary planned distribution method for this study is a U.S. Postal service-mailed questionnaire administered to a systematic sample of the railroad population (randomly selected from union membership databases) in order to extrapolate the findings to the remainder of the industry. A mailed questionnaire is planned to avoid the probability that only online-savvy railroaders would complete an emailed questionnaire (potentially skewing any findings) or, by using a convenience sample, that would reduce the ability to confidently generalize to the industry.

The proposed procedures for this study are adopted from Dillman's (2007) well-researched recommendations. The first step is to send a letter of announcement to each potential participant one week before the survey. This letter will emanate from the FRA and potentially have union leadership signatory included. We expect that this will provide the gravitas necessary to alert the railroader that an important survey will arrive within the week.

One week later, the survey, with a cover letter providing directions and informed consent, will be mailed. The mailing will include a stamped and addressed return envelope and a \$5 cash incentive. Each letter will also include a URL to the online version of the survey and each URL will be coded to match the print survey code. Codes allow the participant to be taken off the follow-up list and coded as "responded". The online option in the invitation letter eases the burden on the respondent, by not requiring him/her to mail back an envelope, and the research team, because the returned paper survey will not have to be processed and scanned.

Two weeks after the survey is mailed, reminder postcards will be mailed to all non-responders. Two weeks later a second reminder postcard will be mailed to all non-responders. Finally, six weeks after the first survey was mailed (2 weeks after the second reminder) a final mailing will be a replica of the first survey mailing – full survey copy and return envelope – and go out to the remaining non-responders with a letter reminding them that the survey will close within 2 weeks of the date of the mailing. The URL will be provided again in this last mailing.

Volpe contact information will be provided on each mailing and the research team will be prepared to respond to participant queries. The web-based version of the survey will be hosted on an Internet survey platform, such as LimeSurvey, Survey Gizmo, Qualtrix, or Survey Monkey. The print version will be created with text recognition software, such as ReMark, so as to enable scanning the data into electronic format.

4. *Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item 2 above.*

Similar studies that do not provide equal value include the following:

- a) a Federal ICT Survey for expenditures on capitalized and non-capitalized equipment
- b) the U.S. Postal Service annual diary survey of households, which includes questions about household Internet access, use, and some attitude items
- c) the federal census population survey, which includes a section on broadband Internet access and use.

Each of these provides some valuable information that may or may not apply to the railroad population. Yet there is no way to isolate (identify and stratify) the railroad population specifically. The current proposed study intends to address this gap. This survey uses a question about internet access in the home from the US Census Bureau's Current Population Survey's section on computer and Internet use so that access in the industry can be compared to access in the general population.

5. *If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods used to minimize burden.*

The data collection will not impact small businesses or other small entities.

6. *Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.*

FRA RD&T creates programs for the railroading population to improve safety in the industry. However, these programs are partly dependent upon railroader awareness of them. Without the knowledge gained from this study, the effectiveness of these programs may be compromised due to not being able to reach the target audience as effectively. The FRA invests significant resources to build effective programs for improving safety in the railroad industry, therefore any information gap in how to reach the target audience would undermine these efforts.

7. *Explain any special circumstances that would cause an information collection to be conducted in a manner:*

- *requiring respondents to report information to the agency more often than quarterly;*
- *requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;*
- *requiring respondents to submit more than an original and two copies of any document;*
- *requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records, for more than three years;*
- *in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;*

- *requiring the use of a statistical data classification that has not been reviewed and approved by OMB;*
- *that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or*
- *requiring respondents to submit proprietary trade secrets, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.*

This is a one-time information collection; no documents other than the completed survey are requested, and respondents are not asked to retain any records. FRA and its contractor will treat the source of the data as confidential. FRA is not a statistical agency using a contractor to collect these data. Therefore, we cannot offer participants information protection under the Confidential Information Protection and Statistical Efficiency Act (CIPSEA, 44 USC 3501-2). We will provide similar protection, to avoid identity, attribute, and inference disclosure, by informing the respondents about the confidentiality protection and use of the information; collect and handle all information to minimize risk of disclosure, including properly training staff; ensure the data are used only for statistical purposes; review information to be disseminated to prevent identifiable information from being reasonably inferred by either direct or indirect means; and supervise and control agents who have access to the data. A unique ID number will be assigned to each participant by the contractor. Only the contractor will know the names of the participants and their corresponding ID numbers. The ID number will allow each questionnaire to be tracked so that only non-respondents will receive reminders. Once the questionnaire is closed and the data are coded, the list of participant names and their corresponding ID numbers will be destroyed. Only aggregate results will be reported. Anonymized data will also be provided to www.data.gov. No data will be reported by individual or by railroad.

8. *If applicable, provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice [and in response to the PRA statement associated with the collection over the past three years] and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.*

Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years — even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

FRA published the required 60 Day Federal Register Notice on April 18, 2017, see 82 FR 18342. FRA received no comments in response to this notice. FRA published the required 30 Day Federal Register Notice on July 18, 2017, see 82 FR 32923.

Experts in survey development and the railroad industry have reviewed and provided input into the instrument. The survey items have been reviewed by TY&E railroaders. A pilot study will be undertaken to improve wording of items and create a more precise instrument. For the pilot study, a convenience sample of 20-30 railroaders, personally known by FRA and its contractor, will be contacted and asked to complete the survey. If they agree, the introductory packet described herein will be sent to them. Railroaders will be encouraged to provide input on the survey items on a 1-on-1 basis by calling the contractor point of contact. Concurrently, a stakeholder panel of key industry representatives will be convened to review the instrument. This input will be incorporated into the instrument. Data collected from these opportunities will also be compared to the final respondents' data to identify possible non-response biases. Based on our experience with the industry, it is expected that those known to the FRA and its contractor will be more likely to complete the survey and will be more connected to ICT.

9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

As with earlier approved studies of Railroad Signalmen (OMB No. 2130-0558), Maintenance of Way Employees (OMB No. 2130-0561), and Dispatchers (OMB No. 2130-0570), the first survey package that goes to each potential participant will include a \$5 bill. This method has been recommended (AAPOR, 2010) to encourage participation and supports a social exchange theory (Dillman, 2011) prediction, where those receiving the gift feel obliged to return the favor and complete the survey. This is also in consideration of the effort involved and to motivate consistent and complete data recording.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.

The instrument will clearly state in the cover letter and on the first page that participants may choose whether to be in this study or not and if they volunteer to be in this study, they may withdraw at any time without consequences of any kind. Participants will also be informed that any information collected in the study will remain confidential and any reporting will be done in aggregate to maintain confidentiality.

As will be explained in the informed consent, each participant will be assigned a unique identifier when address labels are created. The crosswalk listing of identifier and participant will be encrypted and stored by the FRA contractor in a password-protected, non-networked computer and this list will only be used to track participation in an effort to limit follow up efforts. Upon closing of the survey, any personally identifiable information (PII) will be separated from the data. Analyses will occur without any PII attached. All survey data will be aggregated and no individual data will be reported. All data will be kept on a password-protected computer and access will be limited to the principal investigators and team members who have completed National Institute of Health Human Subjects Research Certification (<https://phrp.nihtraining.com/>) or another certified training.

Upon completion of the study all PII information linking names with unique identifiers will be deleted or destroyed, including appropriate erasing of electronic data to ensure non-recoverability.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.

The survey will not include any questions of a sensitive nature.

12. Provide estimates of the hour burden of the collection of information. The statement should:

- Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.
- If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens in Item 13 of OMB Form 83-I.
- Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here. Instead, this cost should be included in Item 14.

Each respondent to the proposed survey will require no more than 20 minutes to complete either the Internet or paper version of the survey instrument. There is no preparation time (i.e., record keeping) required of the respondents, and for each respondent this will be a one-time event. We estimate the maximum total burden hours for this research to be 511 hours. This is based on a maximum number of completed surveys (100% response rate) of 1,533, at a maximum of 20 minutes per survey.

Maximum Number of Respondents	Time Per Response	Total Annual Burden in Hours
1,533	20 minutes	511

13. Provide an estimate of the total annual [non-hour] cost burden to respondents or record keepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 12 and 14).

- *The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life) and (b) a total operation and maintenance and purchase of services component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information [including filing fees paid]. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.*
- *If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondents (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.*
- *Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.*

There will be no additional cost burden to survey respondents. They will be provided with a postage paid envelope for returning the data collection instruments.

14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies also may aggregate cost estimates from Items 12, 13, and 14 in a single table.

Estimates of staff labor, supplies, and other expenses were based on previous research efforts, and the study plan outlined herein and in Supporting Statement B.

Budgeted efforts include creating the documentation and instrument, briefing and developing commitment from union leaders, revising procedures and instruments using insight developed during the process (e.g., from BTS, OMB, the public, FRA, the unions), implementing the questionnaire, participant recruitment, participant incentive, data entry, cleaning, and analysis, report writing, and other project planning and administrative costs. The following paragraph summarizes the estimated study costs.

This is a one-time data collection and, while it should be done regularly to keep abreast of advancing technology, there is no commitment to reoccurrence. The total cost to the Federal Government for this study is \$193,543 over approximately 24 months, which amounts to an annual cost of approximately \$96,771 per year for 2 years.

Task	Cost per Task
OMB Approval	\$11,000
Stakeholder Panel	\$23,600
Data Collection Plan	\$6,000
Pilot Study	\$15,100
Questionnaire Administration	\$38,500
Clean, Compile, & Analyze Data	\$41,600
Reporting	\$35,600
Grand Total	\$193,543

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB Form 83-I.

This is a new, one-time collection. No adjustments are involved.

16. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

The results of this study will be published in a written format by FRA. A summary of the results may also be presented at technical meetings, such as the annual meeting of the Transportation Research Board.

The planned project schedule, shown below, assumes that FRA will receive OMB approval for the study by the end of Spring 2017.

Activity	Date
OMB Approval	Summer 2017
Stakeholder Panel	Spring 2017 & 2018
Data Collection Plan	Spring 2017
Pilot Study	Summer–Fall 2017
Questionnaire Administration	Fall 2017–Winter 2018
Clean, Compile, & Analyze Data	Fall 2017–Summer 2018
Publication of Final Report	Fall 2018 (December 31, 2018)

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

We are not seeking such approval.

18. Explain each exception to the certification statement identified in Item 19, "Certification for Paperwork Reduction Act Submissions," of OMB Form 83-I.

There are no exceptions to the certification statement.

References

- American Association for Public Opinion Research, Cell Phone Task Force. (2010). *New considerations for survey researchers when planning and conducting RDD telephone surveys in the U.S. with respondents reached via cell phone numbers, 2010*.
http://www.aapor.org/AAPOR_Main/media/MainSiteFiles/2010AAPORCellPhoneTFReport.pdf
- Current Population Survey, Computer and Internet Use* (2013), United States Census Bureau
<http://www.nber.org/cps/>
- Current Population Survey Internet Use* (2010), United States Department of Commerce, National Telecommunications & Information Administration,
http://www.ntia.doc.gov/data/CPS2010_Tables
- Dillman, D. A. (2007). *Mail and Internet Surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Dillman, D. A. (2011). Reconsidering Mail Survey Methods in an Internet World. American Statistical Association/American Association for Public Opinion Research Webinar slides, April 13, 2011.
http://www.umb.edu/editor_uploads/images/u54/ASAAAPORwebinar4_11_11.pdf
- Exploring the Digital Nation: America's Emerging Online Experience* (2013). National Telecommunications and Information Administration and Economics and Statistics Administration. <http://www.ntia.doc.gov/report/2013/exploring-digital-nation-americas-emerging-online-experience>
- Federal Railroad Administration, Office of Research, Development & Technology, Human Factors Program, *Key Functions, "Program Structure" para. 1*
<http://www.fra.dot.gov/Page/P0068>
- Federal Railroad Administration (2013), *Research and Development Strategic Plan, FY2013-FY2017* <https://www.fra.dot.gov/Elib/Document/3184>
- [File, T. & Ryan, C., "Computer and Internet Use in the United States: 2013," American Community Survey Reports, ACS-28, U.S. Census Bureau, Washington, DC, 2014.](#)
- Information & Communication Technology Survey* (2011), United States Census Bureau,
<http://www.census.gov/econ/ict/>
- Internet & American Life Project Tracking Surveys* (2013). Pew Research Center,
<http://www.pewinternet.org/2013/06/10/tablet-ownership-2013/>
- Scriven, M. & Roth, J. (1990). Special feature: Needs assessment. *Evaluation Practice*, 11(2), 135-144.

Spence, DeYoung, & Feng (2009). The technology profile inventory: Construction, validation, and application. *Computers in human behavior*, 25, 458-465

The Household Diary Study: Mail Use & Attitudes in FY 2012 (2013). United States Postal Service Headquarters, Washington, D.C.

<http://about.usps.com/current-initiatives/studying-americans-mail-use.htm>

Verdegem, P. & De Marez, L. (2011). Rethinking determinants of ICT acceptance: Towards an integrated and comprehensive overview. *Technovation*, 31, 411-423. DOI: 10.1016/j.technovation.2011.02.004