Questions and answers during the webinar sessions on "E-waste Challenge MOOC live event: Used computers environmentally sound testing repair and refurbishment"

17th and 19st May 2016

Q. What is the cost of a refurbished computer in comparison to a new computer?

A. As I travel around the world, one of the things that I notice is that computer pricing is similar worldwide. If you want to buy a new LCD monitor with a standard size, you would probably pay USD 100 in the U.S.A. and the same price in Ghana. But of course 100 US dollars has different meaning in U.S.A. and in Ghana. Typically, if we see a new computer in the U.S.A. which costs USD 500 you could expect a computer of reasonable specifications which would certainly be functional. That same computer with same storage capacity and speed would probably, once refurbished, cost about a third of what a brand new one does. One of the interesting things to know is that refurbished computers tend to have a smaller failure rate in the first year than a brand new computer. And that is usually due to a notion that is called "implement mortality" in new computers which is the tendency for computer systems to have problems in the first year; so refurbished computers typically have about half of the problems in the first year than brand new equipment.

Q. How do you deal with software issues? In my experience computers become obsolete by software updates not by failure. Do you think free software is a solution?

A. I really agree with you on that. I think that is a very insightful observation on your part. The way I see it using my presentation, is that the hardware does not tend to fail as often as the software. Our experience suggests that software fails 5 to 6 times more frequently than the hardware does. And that is why we work so closely with Microsoft and Apple on making sure that we are following their licenses agreements. And in turn, they provide quite a bit of support in using and installing their software; so it is this symbolic relationship that we have with Microsoft that allows us to use the most advanced operating system with the hardware we have. We currently have the ability to install Windows 10 on all of our refurbished computers. If we put the computer underneath your desk and just have a look at the screen, you would not know whether it is refurbished or new. This is advantageous as it allows the reuse of valuable equipment for a long time. Traditionally in U.S.A. corporations, and in many companies and institutions around the world, the business operations rely on personal computers that have hardware that may last for 8 or 10 years. What does not last as long is the software which lasts about two to two and half years. In other words, what happens during that time period is that so many things have changed with the software, as a consequence, the logical portion of the computer, which starts to run slower, and results in an uncomfortable user experience. And many of us may have had this experience with a computer being 2 or 3 years old and not running as efficiently. This seems to be more of a problem now than it used to be in the past. I think there is a place for free software. But I am a firm believer that we should all use the best possible software.

Q. Is there any plan to limit the so called bad software or hardware from design? Is there any plan by producers (e.g. Microsoft) to make sure that refurbished PCs are sent to developing countries instead of just used ones?

A. I would like to first talk about the issue of software bugs which means a problem in a piece of code or the writing of the logic that is not quite right. It could be good but not quite right and as a matter of fact, every piece of software has these problems. That is why they are constantly being updated. As for the issue of refurbished computers, the refurbishment document that I presented is really an attempt to make sure the equipment that is shipped from one country to another is sound equipment, whether it is refurbished in its country of origin or receiving country. The location of the refurbishing matters to a lesser degree than adherence to a common guidance document. One of the benefits of refurbishing computers within a community is that the process becomes a great way for people to learn and understand computers in detail. Not only the devices are valuable but so is the training of the individuals.

Q. When you said you work mostly with schools, do you also present or share the process and the end products of the e-waste recycling to the students or schools? Or do you release something like certificate as an accountability measure to customers?

A. Young people are very good and very interested in working with us in the refurbishment process. Many of them find it really fascinating and are a very committed demographic on this refurbishment technology. I think the other issue we talked about from time to time is what it means to refurbish in terms of environment. The USEPA has studied this and suggests that the reuse of two computers for one year saves the carbon equivalent of taking an automobile on the road for the same period. So there are sensitive CO_2 emissions savings in addition to the academic training value of computers refurbishment. I might talk about hard drive erasing and other tools. There are many tools and some of them are freely available for download from the internet. Erasing data from the first user or the prior user is an important element and I want to caution anybody who uses this hard drives erasing tools that their design is such that they erase everything on the hard drive, including the software that runs the computer. Once you erase an entire hard drive, you have to reinstall the whole operating system. This takes some specific technical expertise.

Q. We lack refurbishing computer centers within East Africa. This needs to be addressed with the participation of all stakeholders including OEMs (Original Electronics Manufacturers). We lack skills in e-waste management; how can we introduce the same e-waste learning courses in this region, to reduce the skill gap with developed economies.

A. I would suggest that there is lack of computers worldwide. Even in the US, there are about 20 percent of citizens that have never had access to an internet wired computer, although the study was done a number of years ago. I think today, there are about 250 million computers produced every year. If we take a standard life of three or four years and go to 8 to 10 maybe even 12 years, then I think maybe we could start to address the issues of having computers for everyone. There are different scenarios all over the world. There is a lot of value that comes from refurbishment to arrive to this goal; therefore, I think it is something that we need to continue to develop on a regular basis and for the coming decades, with best practices in this area improving as we go. The question about introducing an e-waste learning course in certain regions of Africa is also a very good point as it would also addresses

the skills gap on technology. All of the programs and ideas I talked about today are available and can be implemented on a worldwide basis. It takes some hard work on a few committed individuals but if you start working on it, you will shortly create some real value from what some people suggest is a waste stream. I don't think this is a waste stream, I think this is an opportunity.

Q. How do we address the issue of financing the refurbishing business in the entire value chain?

A. I believe that in order to be successful in this business, you either need to have a major support or must diversify your business activity. And that is why in my presentation I talked about taking and getting added value through understanding the market in which parallel recycling chains can be established. So, maximizing the value of the materials that you have access to is the way to self funding of this kind of activity. Of course it would be wonderful if there were government or institutions of some kind that would support this on an ongoing basis.

Q. I am not necessary in line with the definition between "repair" and "refurbishment". Definition of APICS (http://www.apics.org/about/overview) for me is more correct. However, I agree with the steps related to test and data-wiping. Then, according to the test, you may update the software and proceed to repair. My point is that refurbishing is not only related to software.

A. In our facilities, we attempt to do repair first and we look to make sure that the physical device is whole before we add the software and the logical portions into the system. We use software to make sure that the hardware is whole. So I agree in one sense with you but I think a little bit more detail is necessary for this presentation. I think we could agree that the repair and refurbishment process is a very detailed process that takes a considerable amount of attention and learning. So the point of refurbishing is not only related to software. The reason why I distinguish them in this conversation is because I want to make sure that we distinguish or understand that there is not only a physical component to this devices but a logical component. But using the definition of refurbishment, presented in the documents, is very specific. So we have to make sure our language is clear on the process. It is the same if we consider the notion of recycling, including material recovery and reuse. And we often just think about recycling as material recovery. My purpose of making this distinction in the language in my presentation is to be clear about the different processes involved.

Q. Based on your experience, what is the feasibility of this type of business in European countries? Does it require huge investments to start off? How much needs to be invested in developing countries to start this kind of business, according to your knowledge.

A. Take Canada as an example, they invested millions of millions of dollars into refurbishment infrastructure over many years, as a country. And the net result of that is 25% of the computers in Canadian schools are refurbished computers. This is an example of large governmental participation and lots of people involved in it over many years, decades even. As for the individual level, there are 6500 Microsoft registered refurbishers around the world in 79 different countries and you can become one of them and receive information on how to do refurbishment and repair. So these are the two extremes.

The constancy between those two extremes is the availability of materials to be refurbished and repaired. Fortunately though, there are 250 million computers manufactured every year, of which close to 90 percent are replacing computers already in service. Hopefully these will have a second life or even a 4th life in another environment. So I believe the capacity for the refurbishment globally can be boosted. The current capacity is maybe 5% of what is possible. So the short answer to your question is: yes, people can start this business because it is a very promising one. The nice part of this is that the skill set can be used both for refurbishing computers and teaching people about computer systems. In your community if you want to import or build technology, a great way to start is through this refurbishment and repair process. It is a relatively low risk work and fortunately we have plenty of materials to use.

Q. What could be the investment once you have the materials? Do you think a small business could be started with a small investment or does it require a huge investment?

A. I absolutely think it could be started with a small business. For example, in Colombia, individuals with the right set of skills and a little bit of capital can start their own computer repair refurbishment business and build it up to 3 or 4 people. This happens on a regular basis. Each entity, when it starts up, obviously needs some kind of support, whether it is financial or otherwise. But certainly, one could do it with as little as 5000 dollars and a good commitment to learn. This is the range between small businesses and companies that are doing over USD 100 million per year in sales.

Q. There is a question about refurbishment and the availability of equipment for it to be performed in a profitable manner. Is equipment availability an issue for this type of business?

A. We work internationally, but I suggest people start within their own environment, within their own communities, analyzing the amount of equipment available. There is available equipment almost everywhere in the world which can be acquired if not immediately available.

Q. The approach presented here made sense in terms of repair and refurbishment for reuse. My question is should this be implemented as a policy in member states?

A. If it can be done anywhere in the world I think it should it be done anywhere in the world. The hierarchy of Environmentally Sound Management (ESM) of wastes places reuse at the top as the first best management option. Now we want to legitimate reuse with the clear objective of making the equipment reusable and not as a disguise for something that would otherwise be waste. Yes, indeed we should reuse and that is environmentally the best thing to do.

Q. Have you had any experience with informal recyclers?

A. I have not had much experience with informal recycling; we have had some experience some years ago within the United States. We implemented in our firm a process for the certification of our environmental management system. I prepared my presentation to reach out also to the informal sector. I believe that there is a real opportunity to work with the informal sector in order to improve the ESM of the used electronics.

Q. The problem with refurbished machines is to release a warranty of functionality, is it the refurbisher who should give the warranty service?

A. Typically, refurbishers do issue a warranty. And the measure we use to assess the quality of our refurbishment is the percentage of our systems that do not need to be repaired again in their first year. Our failure rate in the first year versus brand new equipment is about half comparing to new equipment. This means it is less likely to fail because it has been refurbished. So a good way to differentiate high quality refurbishers from others is if they give you warranty. We give one to three years warranty on our equipment.

Q. What are the experiences in the countries of Latin America for the application of these guidelines?

A. I know there are quite a few people in Latin America who are refurbishing. And there are hundreds that are registered in the Microsoft registration program. That is probably a good indicator of some level of activities going on in the country. Given the value and usefulness of these technologies, I think it is safe to assume that this refurbishment process, whether it is formal or informal, is happening globally in every country. And our goal with the guidance document I presented is to see what we can do to continuously improve the ESM in both formal and informal sectors which are working with these e-materials.

Q. Apart from the online resources cited, are there any special programs that may be facilitated by the Secretariat which may provide practical training to persons interested in the business of repairing and refurbishing PCs?

A. I would recommend working through the Basel Convention regional centers, I know specifically the one in Central America, which is a very active center, and certainly we can work together with them and other organizations whether it is Microsoft or others to bring a greater level of information.

Q. Could you share any information on the labels or certificates which guarantee functionality of a repaired/refurbished equipment to customers, and which are validated by any international organizations or main brands?

A. Currently, public available ones do not exist, although there is one being developed by a few organizations. The idea is that we perform a specific task and make that task and functionality known to individuals by including information on it in the box when they buy equipment online. What you have mentioned is what I would consider a more mature part of the industry's development, and hopefully we should start to find more things like this. So, unfortunately, there is no third party validated verified opinion on that. But as a consumer, if your refurbishers can give you some documentation on what we in the industry call a burning test, this would be a good indication that it is a high quality refurbisher.

A. This issue is very important for transboundary movements of e-waste. The Basel Convention adopted on an interim basis, technical guidelines on transboudary movements of e-waste which include criteria for distinguishing between waste and non-waste. In particular, the guidelines contain criteria to distinguish between waste and non-waste when used computers are shipped, for example. One of the criteria in this type of shipments is that a functionality test should accompany the shipment. The guidelines contain indications of what parameters were tested, or warranty should cover. There are also recommendations on how to carry out sound testing of used equipment. The technical guidelines are available at this website:
http://www.basel.int/Implementation/Ewaste/TechnicalGuidelines/DevelopmentofTGs/tabid/2377/Default.aspx

Q. Once a refurbisher sells a computer, do they become a producer in EPR take back schemes?

A. The EPR stands for Extended Producer Responsibility. So the question is if I refurbish a Dell computer, am I responsible, as the refurbisher, for taking back the computer from our customers when it becomes waste and making sure that it is processed in an environmentally sound manner. The quick answer to that question is yes. Of course, I cannot require from anyone I sold computing equipment to, to give it back to me as they have the right to do what they want. But I certainly make our organization available to collect back the materials. I would also make this a standard responsibility for any manufacturer of electronics. One of the main benefits for the refurbishment business is that about 50% in weight of the materials received back contains pieces that can be reused whether it is memory or hard drive, etc. To conclude, yes, we (refurbishers) have the responsibility, as stakeholders in the environmentally sound management of e-waste, to take back equipment.