

What about a non-profit platform? Bringing the right sides together against food waste and hunger

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Poverty, Hunger, and food waste

The donation of surplus food has been developing significantly in Italy during the last two decades, but it still represents a smaller fraction of the total amount of food devoted to food aid as compared to the larger amount of food produced exclusively for the purpose – financed through national and communitarian programs (i.e., PEAD¹ from 1987 to 2013, FEAD² since 2014) targeting the Sustainable Development Goals (hereafter, SDG) number 1 (i.e., no poverty) and 2 (i.e., zero hunger). Indeed, these programs provide food aid to the most deprived, along with other basic material assistance (e.g., clothing, and hygiene products) and social inclusion measures (e.g., job assistance). These programs are approved by the European Commission and then managed by national authorities. After the production of food is assigned through calls for tender, products are transferred to food banks, from which they are distributed across frontline charities that deliver food aid to the poor.

Over time, thanks to the increased attention to the problem of food waste (SDG 12.3), gradual regulatory advances have increased surplus food donation, making it available for providing food aid to people in need (SDG 2).

Below we present a brief historical overview of the development in the Italian legislation that moved the surplus food donation practice forward, which represents the background of this teaching case.

A brief overview

The first relevant provision to incentivize surplus food donation has arrived with Law 133/99³, according to which food business operators donating surplus food to charitable organizations, specifically Non-Profit Organizations (hereafter, NPOs) can recover the related Value Added Tax (hereinafter, VAT). The VAT – in other countries known as Goods and Services Tax (GST) – is a tax on the value-added that, in principle, should represent a cost for the final consumers only. However, along the value chain, businesses pay the VAT to suppliers when buying, and receive VAT from buyers when selling. Before law 133/99, the VAT paid on food that eventually became unmarketable represented a cost for the food business operator, regardless of whether it was being

1. COUNCIL REGULATION (EEC) No 3730/87 of 10 December 1987 laying down the general rules for the supply of food from intervention stocks to designated organizations for distribution to the most deprived persons in the Community. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31987R3730&from=IT>.
2. REGULATION (EU) No 223/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 March 2014 on the Fund for European Aid to the Most Deprived. <https://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2014:072:0001:0041:EN:PDF->
3. LEGGE 13 maggio 1999, n. 133, Disposizioni in materia di perequazione, razionalizzazione e federalismo fiscale. (GU n.113 del 17-5-1999 – Suppl. Ordinario n 96). <https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:1999;133>.

donated for charitable purposes or simply discarded as waste. After the financial incentive, instead, food business operators donating their surplus food to charitable organizations, rather than discarding it as waste, could recover the VAT paid on it.

The next and perhaps the most significant regulatory advancement is represented by Law 155/03⁴, also known as “legge del Buon Samaritano” (the law of the Good Samaritan, in English) – similar to the provision of the Bill Emerson Good Samaritan Food Donation Act approved in 1996 in the US. Adopted in 2003, the law equated NPOs providing food aid to “final consumers”, thereby exempting NPOs from all those bureaucratic obligations regarding the assurance of the proper preservation, transportation, storage, and use. These bureaucratic obligations were complicating the food aid assistance to the indigents. Most importantly, in this way, donors were not responsible anymore for the safety of the food after the donation, which was then further pointed out by the Italian Law 147/13⁵. According to this law both food business operators donating surplus food and NPOs using the donated food to feed the indigents, each for their part of competence, must ensure food safety during transportation, storage, and use. This includes, for instance, the compliance with the principles of Hazard Analysis and Critical Control Points (hereinafter, HACCP) for food hygiene, and other duties and responsibilities identified by the General Food Law⁶. This regulatory advancement led to the formulation of a specific national manual⁷ of correct operating practice validated by the Italian Ministry of Health, to the realization of which also contributed the NPO constituting the case at hand.

The last noteworthy development in the legislation arrived with the Law 166/16⁸, which further extended, simplified, and incentivized the food donation process. The law introduced the possibility to donate food products past the ‘best before’ date, also known as ‘date of minimum durability,’ after which, if properly stored, food is still considered safe to be eaten. It also simplified the

4. LEGGE 25 giugno 2003, n. 155, Disciplina della distribuzione dei prodotti alimentari a fini di solidarietà sociale. (GU Serie Generale n.150 del 01-07-2003). <https://www.gazzettaufficiale.it/eli/id/2003/07/01/003G0174/sg>.
5. LEGGE 27 dicembre 2013, n. 147, Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato (Legge di stabilità 2014). (13G00191) (GU Serie Generale n.302 del 27-12-2013 – Suppl. Ordinario n. 87). <https://www.gazzettaufficiale.it/eli/id/2013/12/27/13G00191/sg>.
6. REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002R0178&from=EN>.
7. Recupero, raccolta e distribuzione di cibo ai fini di solidarietà sociale: Manuale per corrette prassi operative per le organizzazioni caritative secondo Articolo 8 del Regolamento (CE) N. 852/2004. https://ec.europa.eu/food/sites/food/files/safety/docs/fw_library_guide-good-practice-italy_2016.pdf
8. LEGGE 19 agosto 2016, n. 166, Disposizioni concernenti la donazione e la distribuzione di prodotti alimentari e farmaceutici a fini di solidarietà sociale e per la limitazione degli sprechi. (16G00179) (GU Serie Generale n.202 del 30-08-2016). <https://www.gazzettaufficiale.it/eli/id/2016/08/30/16G00179/sg>.

food donation process: before the law, food business operators could freely donate surplus food up to a market value of five thousand euros, a limit beyond which they had to notify the Revenue Agency; the new provision set the threshold to fifteen thousand euros. Finally, the law incentivized donation by allowing municipalities to grant a reduction of the waste tax to those food business operators donating their surplus food.

The aforementioned advancements in the legislation highlight a process that involves multiple iterations and additions of regulations aimed at developing an encompassing system of laws that are likely to allow for transformational practices to be created. In principle, these developments in the legislation allowed for the emergence of a new social supply chain concerned with providing food aid to the poor under SDG 2, which includes food waste reduction, as per SDG 12.3. With the publication of the Guidelines on food donation⁹, the EU underscores that food aid, under FEAD regulation itself¹⁰, may also be donated other than purchased with FEAD resources – so that FEAD may contribute to reducing food waste as well. However, this new, circular supply chain remains still separate from the FEAD national program and its full implementation poses non-trivial challenges to the actors involved, as it requires important transformations in the established systems. In the next sections, the attempt of a food bank to shift the food donation system towards more sustainable practices is described.

9. COMMISSION NOTICE (2017/C 361/01) – *EU guidelines on food donation*. <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:C:2017:361:FULL&from=EN>.

10. “[...] *the Fund may support activities related to the collection, transport, storage and distribution of food donations.*” See page L 72/9, REGULATION (EU) No 223/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 March 2014 on the Fund for European Aid to the Most Deprived. <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2014:072:0001:0041:EN:PDF>.

The food bank: Associazione Banco Alimentare Roma ODV

The food bank ‘Associazione Banco Alimentare Roma ODV’ (hereinafter, ABAR) is a nonprofit association established in December 1990 by an initial group of seventeen volunteers willing to engage in activities to support poor people in the city of Rome and in the Lazio Region, four of whom are current associates.

The core “business” of ABAR is to collect and distribute food to charities that ultimately provide aid to the needy members of the community. The majority of the total food distributed by ABAR comes from Agea (i.e., Agenzia per le Erogazioni in Agricoltura), which is the Agency of the Italian Ministry of Agriculture responsible for the FEAD (i.e., Fund for European Aid to the Most Deprived) at the national level. From Agea, under EU Regulation 223/2014, ABAR receives food products that it then redistributes to more than 300 local charities in its network (306 in 2022), which, in turn, provide food aid to about 117,000 indigent people. The rest of the total food distributed is recollecting from the market. More specifically, this activity consists of recollecting the food that is no longer tradable by food producers (i.e., usually medium-large-sized firms operating in the phases of food production and transformation) and groceries stores, that is still edible (e.g., upcoming expiration date, damaged or incorrect packaging, excess stock for overproduction, etc.), and then providing it for free to charities that assist indigent people living in the city of Rome and in Lazio Region at large.

Further, once a year, ABAR organizes a food donation day, called ‘raccolta di solidarietà.’ Since the year 2000, every year, usually in the last week of February or the first week of March, more than 300 supermarkets and more than 200 charities participate in this event throughout the Lazio Region. On this day, each supermarket participating in the event invites its customers to buy some groceries for the local charity, which can be found in a stand right at the entrance of the store. The event is organized by ABAR, and it is mainly financed by external sponsors, including enterprises. On the food donation day of 2019, 314 supermarkets and 222 charities participated in the event, involving more than 2700 volunteers, which resulted in 230 tons of donated food. Each of the charities directly kept the groceries they were given in the supermarkets wherein they had their stand. From a value creation perspective, enterprises who sponsored ABAR’s project captured value in the form of advertising, the participating supermarkets benefited in terms of both reputation and increased sales, while charities, ABAR, and the community of indigents got the 230 tons of food for the food aid service.

The activity of the association is almost entirely carried out by volunteers, about 50 people. Only three people are employed to ensure the continuity of service, two of which work at the warehouse and one Director of Operations. Coordination is carried out by a board of directors made up of 8 members – including the president, the vice-president, and the treasurer – that meet once a fortnight. Board directors are selected by an assembly of 25 associates. Thanks to the priceless commitment of volunteers, ABAR has been able to guarantee the necessary food distribution service to charitable organizations of the territory for 30 years.

WHAT ABOUT A NON-PROFIT PLATFORM?

ABAR has received the *Volunteer Award 2020 – Builders of the common good* (Premio al Volontariato 2020 – Costruttori del bene comune) by the Senate of the Italian Republic as: “*for over thirty years it has been a point of reference in the fight against food waste and in the recovery of surplus food to be used for those who need them most. For the important action carried out during the pandemic, which made it possible to respond to the new poverty generated by the crisis with interventions based on principles of inclusion and environmental sustainability.*”

ABAR was, in fact, one of the first organizations able to recover and distribute food surplus in Italy, and one of the first to innovate its operating practice by leveraging the potential offered by digital technologies.

Part A: BeeAPP

The history of the smart food donation processes initiated by ABAR harks back to 2012, when a group of volunteers started working on a project to facilitate surplus food recovery. BeeApp was the project called, named after the bee: a virtuous, laborious insect that constantly communicates where the food is to the rest of the colony, works with other bees for the common purpose of nourishing the beehive and, in so doing, grants the pollination service that is essential for the life of many. Such a metaphor well represented the logic permeating the new system. Indeed, the concept was born from the idea of collecting food surplus from operators in the food sector, otherwise doomed to waste, and repurposing such foodstuffs to provide free of charge food aid to the most deprived, by leveraging the involvement of the numerous frontline charities distributed across the territory fighting against hunger and, in so doing, contributing to food waste reduction. At that time, this was the very first Italian attempt to develop a digital platform that served such a purpose, and no references and anchors were available for such an important decentralization. After an intensive design phase, prolonged by a tiresome search for funding, the project was launched on July 30th, 2014 by ABAR, thanks to the contribution of Telecom Italia Foundation (nowadays, the TIM Foundation) which largely financed the development of the platform.

In December 2015, following the presentation event, one year after its testing, BeeApp had officially begun, involving three stores belonging to two major supermarket chains, and seven frontline charities.

The system had the following functioning:

1. The store with food surplus availability had to send an e-mail to the BeeApp platform, with the document of transportation (DDT) attached.
2. Upon receipt of the donor's email, the system was then sending an e-mail notification to one of the frontline charities associated with the store, based on their last date of collection and positive track record (to ensure equal shifts and penalize the least reliable charities);
3. The notified frontline charity had to collect the donation from the donors, to be used to assist those in need, and then upload the scan of the signed DDT into the platform.

The total food surplus saved and donated through BeeApp in three years of experimentation – despite only three stores were involved as donors, with 1135 donations exceeded 26 tons of food products, of which over 16.9 tons are represented by fresh highly-perishable food, such as dairy products, eggs, poultry, meat, vegetables, and fruits.

The results of the experimentation demonstrated the great potential of BeeApp; however, after three years, the number of supermarkets involved didn't increase, as well as the one of charities – that actually decreased, hence highlighting the need for additional changes aimed at facilitating wider adoption and use of the platform.

On the one side of the platform, there were supermarkets which, since the very start, were quite doubtful about the feasibility of their involvement as donors in such a platform. Once convinced by the volunteers of ABAR, and thanks to a process designed to be non-invasive of the supermar-

kets' processes – which represented one of their main concerns – they started donating quite frequently, in some periods even daily. This placed significant pressure on the other side of the platform, that is, on the receivers of the donations, ergo frontline charities. Such pressure was mainly due to the fact that until then, frontline charities were only used to collect the food at ABAR's warehouse, or during the special event of the “*raccolta alimentare di solidarietà*”, which was typically non-perishable, long-life food products, such as dry pasta, rice, tomato sauce, canned legumes, canned tuna, canned meat, flour, olive oil, biscuits, and the like. Hence, these organizations were not familiar at all with the process of recovering highly perishable food, such as all those products normally exhibited in the fridge windows of supermarkets. As a matter of fact, collection of this type of food requires particular hygiene measures, above all, using insulated carrier boxes, usually made of polypropylene (PPE), to prevent the temperature increase of cold food, as well as a prompt organization of the distribution of the food to the most deprived, in order to minimize the time between collection and consumption. These new organizational requirements placed significant stress on frontline charities, and the difficulty to embed the new operating practices was exacerbated by two main factors. First of all, frontline charities are small-sized non-profit organizations that are typically and entirely based on the contributions of volunteers; this makes it hard for frontline charities to provide a dynamic and fast response upon receiving the notification that food surplus is available for donation. Second, the pool of volunteers that carry out the frontline charities' activities consists of people with a quite advanced average age, which certainly was not helping with learning new operative practices based on a digitalized system. As a consequence, the main issue was the timeliness of response of frontline charities: sometimes they were not readily accepting or declining the assigned donation, determining the failure of the donation process because of the accumulated delay in the assignment routine. Further, three out of the ten frontline charities involved were not keen to use the platform – mainly because of a lack of the required (basic) digital competencies – and still prefer to be alerted by phone when there is surplus food ready to be picked up.

Thus, not only ABAR had to manage these issues by delivering training, but soon it became all about daily calls to the frontline charities to ensure they were able to collect the food. ABAR had to undertake this bridging activity to avoid not even a single donation being left unpicked: indeed, right from the first couple of times in which frontline charities failed to pick up the donations, supermarkets immediately disengaged with the initiative and dropped sending the notification of their food surplus availability. This required ABAR to work hard on multiple re-onboarding of supermarkets, along with monitoring the activity of frontline charities for every donation, by checking on them via phone calls, in order to find substitutes promptly, when needed.

Part B: ecibo

Although the lack of timeliness by frontline charities was initially compensated by ABAR volunteers assisting them by phone, the need for further simplification of the system to ensure it could work on its own started to emerge clearly. This need, along with the new law approved during the fall 2016 (i.e., Law 116/2016), which further simplified and incentivized surplus food donation, pushed the volunteers involved in the project to enter a new design phase for innovating the platform. While the food surplus donation system was continuously running thanks to the intermediation by ABAR's office, with volunteers "manually" assuring a smooth donation assignment process (i.e., through phone and e-mail coordination), the innovation process was impaired. The software development competence holder was the software house, and the partnership between the latter and ABAR was a transaction-based supplier-client relationship: although they offered a discount for implementing changes, the amount was beyond the reach of ABAR, as no additional budget was available for the project. Then, the inauspicious passing of the founding President in 2018, completely paralyzed the search for solutions, and the innovation process had seemingly reached an impasse. After the new President and Vice President succeeded, and two volunteers previously involved in the project were appointed members of the board of directors, ABAR profoundly committed to perpetuating and innovating the project.

Eventually, during the summer 2018, ABAR engaged with a highly-skilled ICT engineer – sourced from the Vice President's personal network – who was willing to help ABAR voluntarily to redesign the system, and with his help, they eventually rebuilt it from scratch. In fact, taking advantage of this opportunity and treasuring the lessons learned, new features were implemented in the renewal of the system, which, by the beginning of 2019, was made into a simple, intuitive, and fully automated platform, optimized to prevent food surpluses from turning into waste through a streamlined donation process.

The renewed platform was called *ecibo*, owing its name to *eccedenze di cibo*, the Italian for food surplus, playing on the prefix "e" that describes anything transmitted over the Internet.

Although having the very same aim as BeeApp, the functioning was slightly changed to accommodate improvements, starting from the fact that the web app was now accessible at www.ecibo.it by any device, including smartphones.

1. Logging into the platform, food business operators (in particular, the stores of big supermarket chains) can easily insert a donation of surplus food, specifying the date and time from and by which the donation can be collected – a process that takes less than 30 seconds.
2. Such availability of surplus food is then notified, through the platform and via e-mail, to the numerous frontline charities that look for these foodstuffs for providing food aid to the most deprived.
3. One of the charities books the donation, specifying the date and time of pick up (within the range provided by the donor), and the platform notifies this information to the food business operator through the platform and via email.

4. When at the premises of the donor to pick up the donation, the charity signs the DDT and can upload a picture of it with the smartphone, to complete the process.
5. The admins of ABAR check the donation and, if everything is correct, they close it.

One of the most important features of *ecibo* concerned the notification function: The new system allowed the association of more than one charity to each donor and offers two alternative ways of managing the notification. One possibility is to go for the default setup of the donor profile, designed in a way that each donation published by that very donor is notified automatically and simultaneously to all the frontline charities associated to that given donor – so that the frontline charity that books the donation first, is the one acquiring the right to pick it up, under a “first come, first served” basis, thereby creating a healthy competition across charities. Another way is to enable the calendarization feature, thanks to which it is possible to assign specific frontline charities for specific days of the week – so that, for instance, a charity having its distribution activity on Tuesday and Thursday evenings, can be assigned to a specific donor nearby its premises for those days, so that such a charity receives an exclusive notification every time a donation collectible on those days is entered. The calendarization also allows for a hybrid notification strategy: for some days of the week, specific frontline charities might be assigned, whereas the default competitive assignment might be preferred on the remaining days.

The reason behind the introduction of the competitive assignment system was to maximize the likelihood of a donation being booked and collected, thus minimizing the risk of donors deciding for opting out of the food surplus donation project. At the same time, the calendarization feature allowing for specific and exclusive assignments for specific days of the week was designed to reward the consistency of the most reliable frontline charities, as well as to shelter the possibility for the least digitalized charities, the volunteer of which need more their time to book a donation, to get the food supplies that under a competitive assignment notification strategy would not be able to book, and thus collect the goods.

Another important feature that was added to *ecibo* consists of the possibility for each donor and frontline charity to have more than one user that can access the platform. Indeed, both actors are characterized by the fact that is not the same person that, on their respective sides, handles the donation process. This was particularly relevant for the side of frontline charities. Although even supermarkets have personnel that can take up different shifts, normally the computer from which the people working in the store access the platform is the same, the e-mail account that they use is the one of the store – accessible to that very same computer, and thus one account is typically enough for them. Conversely, frontline charities are nonprofit organizations based on the contributions of different volunteers that are hardly found in the same place or have access to the email account of the association. Therefore, having the possibility to include more than one user, each one with their username, password, and email account, that can access the platform and operate on the behalf of the association, was key to minimizing the response time and enhancing coordination for frontline charities.

Regarding the process, the user interface was simplified, and the information required from supermarkets was kept to a minimum. Instead of asking for a detailed list of food products contained in the basket, the ABAR team solved the problem of conveying the necessary information to charities about the logistics underlying the physical collection of the basket of goods donated by creating a three-icon choice: motorbike, car, or van. Therefore, the information required for a donor to notify a new donation opportunity was then limited to three pieces of information: the type of vehicle needed to carry the basket, the nature of food products contained in the basket (perishable, non-perishable, both perishable and non-perishable, cooked, frozen, or mixed), and the time range within which frontline charities could collect the basket.

Another critical feature was the possibility to access the platform through the smartphone, and thus the possibility of uploading a picture of the signed DDT, right after having signed it at the donors' premises – whereas, previously, frontline charities had to go back to their premises to scan the signed DDT for its transmission to ABAR. This was creating important delays in the receipt of the documents certifying the actual donations and feeding a growing amount of backlog work for ABAR team. Indeed, according to law 116/2016, it is necessary for the receivers of donations to submit a formal quarterly declaration listing all the DDTs' reference numbers and dates that have been received by a specific donor in that very period. Such a quarterly declaration can be used by donors to claim their tax reduction and should be sent to the donor within the month following the quarter. At the end of every quarter, it was all about understanding whether booked donations were successfully collected or not, hence, the *ecibo* feature allowing frontline charities' volunteers to easily upload pictures captioned with the smartphone was designed in the direction of making this entire process much smoother and faster.

All these features, although designed, implemented, and tested by the ABAR team, were left unused for a prolonged period of time. Even though by the beginning of 2019 the system was renewed, streamlined, and made easier to use, when pursuing the shift to the new system ABAR faced more resistance than expected. The long phase of stagnation in the number of actors involved on the donors' side – three supermarkets – alongside the decrease in the number of frontline charities involved – from ten to four – eventually drove donations to take place outside the platform: frontline charities found easier to bypass the *BeeApp* platform, which initially was serving as a hub, and connect directly with the donors that represented the ideal match for them. One supermarket was donating every two or three weeks, with one frontline charity responding upon call; the second supermarket was donating every two or three months, with a frontline charity right across the street also responding upon call; the third donor was donating every day with two frontline charities performing pick-ups at regular times according to an agreed weekly schedule – one frontline charities picking up the donations every Wednesday, while the other one collecting donations the rest of the days. There was no incentive for those frontline charities to start using the new system to engage with the same donors if the organization of pick-ups with them was already sorted out and managed offline.

People at ABAR well acknowledged the need for a powerful action aimed at involving new donors and a set of additional frontline charities to bring the system behind the ecibo platform to life. However, at that time, ABAR did not have the resources to engage in such an endeavor, although it was essential for a full-scale expansion of the platform.

On the one hand, the problem was about counting on the right human resources: the project re-start-up demanded a consistency that could have hardly been achieved with scattered contributions by the few volunteers available at that time. Most of the human resources were busy handling core activities that were still disrupted by the inauspicious passing of the founding President, who has been the essential reference point for all the activities of ABAR and the glue of the very association. On the other hand, the problem was about the shortage of financial resources required to buy the equipment representing the essential endowment for frontline charities to engage in the collection of surplus food – the insulated carrier boxes.

While working on the reorganization of activities around ABAR, the team of the innovative project applied for funding to the Lazio Region, which eventually turned out to be successful, giving the possibility for starting a new weave of implementation at the beginning of February 2021.

Preparing the ground for platform launch

One of the pillars at the base of the realization of the project consisted in the scouting activity necessary to the identification of potential donors – i.e., supermarkets – to involve in the ecibo platform. ABAR team started initially with a desk search of potential donors to contact. Contacting potential donors was a particularly time-consuming activity, which did not always produce the desired results. The ABAR team employed a double strategy:

1. Multilevel, as initial donors were contacted both at the bottom – thus following a bottom-up approach by calling the store or going there in person to propose the initiative to the store manager – and at the top – therefore under a top-down approach, trying to contact the top management or the administration of the supermarket chain to sign an agreement.
2. Multichannel, as attempts have been made to contact potential donors in person, by phone, by email (when available), through the official website contact form (when present), and via social networks, mainly LinkedIn.

Besides this large-scale activity, which was carried out on a continuous basis since the start of the project, the managers of the three supermarket chains already involved in BeeApp with one store each were also contacted. At the end of February 2021, an agreement was eventually found with one of the three supermarket chains originally involved in the BeeApp experimentation, and eight new supermarkets were selected for their involvement in the project. This made it possible to proceed, drawing from the pool of the charitable organizations associated with ABAR, with the identification of the frontline charities that required the food supplies to assist people in need, and, most importantly, that were willing and able to recover surplus food. The activities underlying the identi-

fication of frontline charities were certainly simpler than the identification of donors, but they still hold a certain degree of complexity. To begin with, it was necessary to build a map projecting the geographical position of the supermarkets and, at the same time, create a second layer on the same map that projected the geographical position of the frontline charities, in order to identify which were the closest frontline charities for each donor store. In a second step, it was necessary to make sure that these charitable organizations were willing and had the capabilities to recover food surpluses at a given store (i.e., the one closest to them). ABAR recruited twelve charities, which were the ones keener to participate among those located nearby the stores' premises.

The proximity of the stores to the frontline charities' premises did not only have reasons of convenience for the collection of the goods but, more importantly, for the sake of recovery times reduction, thus allowing the fastest distribution of the recovered food and avoid its deterioration – to which the donated goods are particularly susceptible, as they are usually highly-perishable products close to the expiry date or the best-before date. Since the first contact, for each frontline charity, it was somehow necessary to anticipate how the recovery of surplus food should have taken place. Hence, a group training session was organized with all the twelve frontline charities involved with the aim of enabling the charitable organizations to be ready for performing the first collections once the stores were ready to donate. All the operative aspects were covered: i., the email notifications to the frontline charity whenever the assigned store donates on the day of the week appointed for collection; ii., the need to book the donation indicating the expected collection time which must be within the time window indicated by the donor; iii., the need to carry the stamp in order to be able to stamp and sign the transport document (DDT) prepared in duplicate by the supermarket making the donation; iv., the need to carry with them one of the copies of the DDT together with the withdrawn goods, which will later be scanned (or simply photographed) and uploaded by the frontline charity to the *ecibo* platform to ensure full traceability of the operation.

On the supermarket side, once the list of the stores comprising the contacts of the store managers and deputies was made available by the supermarket chain, the ABAR team started scheduling appointments with the various stores. Whenever possible, appointments were scheduled at times in which both the store manager and the deputy (and other deputies, if any) would be available. Once the appointment was scheduled by phone, and the details of the store acquired, it was necessary to create a user profile on *ecibo* to use the platform. Hence, before the appointment, the profile was created for managers and deputy of each store to insert a donation whenever food surplus was generated, and then the credentials (i.e., username) were sent via e-mail along with the appointment confirmation, the instructions to set a password for the account, and the user guide. This latter was appropriately prepared in advance by the ABAR team to facilitate the training session and allow the supermarket personnel to easily find how to perform the basic steps to use the platform in case of doubts.

‘In the occasion of the training appointment with the supermarkets’ personnel, a donation test was carried out. Many problems emerged, for example, some store managers were unable to use the PC – sometimes due to lack of computer skills, sometimes because the firewall of the store blocked access to sites external to the organization, or blocked the e-mails coming from the @ecibo.it domain because labeled as not secure. In other cases, problems came from the impossibility of printing the DDT in duplicate; sometimes the DDT could not even be generated because the information system of the store was not authorized to perform the function of transforming a scrap bill – a list of products becoming waste because no longer suitable for sale – into a list of products that were donated to a charity, as still edible, and thus suitable for donation as provisions of law 166/2016. In these cases, it was necessary to interact – with quite a few problems – with the management of the supermarket chain, in order to obtain IT assistance. Hence, on several occasions, training had to be postponed, often taking place at the very same time of the actual first donation. Then, it was all about monitoring the platform, constantly following the progression of the process for each donation made available by supermarkets. This entailed solving problems of booking, correcting the wrong expected collection time, correcting the wrong bookings, along with issues related to the collection of the donation that, even if booked by a frontline charity, due to various unforeseen events – such as the unavailability of the vehicle, a punctured wheel, the unavailability of the volunteer – could no longer be carried out by the booked frontline charity, and which therefore required the volunteers of ABAR to promptly re-assign the donation to another frontline charity that could recover the donation and prevent it from being left unpicked.

This activity was particularly critical since, if the donation had not been recovered, the supermarket would no longer have been able to recover the VAT on the purchases of the goods that were the subject to donation (which it would have instead deducted with the scrap bill, then throwing them away), hence potentially discouraging the supermarket from continuing the donations. Several problems had to be managed in this phase, including non-trivial issues relating to the quality of the food donated, which sometimes left the frontline charities unhappy, thus determining significant reluctance in continuing to recover food from the same store, especially when it came in small quantities.

As far as food surplus quality is concerned, it was critical to organize training sessions that went well beyond the technical explanation relating to the use of the ecibo platform: in fact, it was necessary to clarify the type of surplus that the frontline charities could collect, namely products that because of the proximity to the expiry date or best before date, could no longer be sold; such products were not simply about to expire but also highly perishable products, such as fresh dairy products, fresh pasta, meat, eggs, fruit and vegetables, bread, and bakery products – which unfortunately, by their nature, do not leave particularly large time margins for their recovery and consumption, requiring a very timely distribution immediately after collection. It was necessary to train frontline charities on the need to carry out quality checks on the suitability of food for

human consumption, discarding packaged foods deemed unsuitable and eliminating it, where possible (e.g., citrus bags no longer salable because they contained a spoiled fruit, which would require to discard the spoiled fruit from the bag before distributing it, in accordance with the correct hygiene practices). ABAR's contribution was essential in explaining to them how to best organize the collection of these foodstuffs. On the one hand, they were instructed to make use of the isothermal containers in PPE that were purchased and supplied to frontline charities, while on the other hand, inviting them to collect the donations as soon as possible to ensure greater time margins for distribution for the lunch meal – to be preferred for obvious reasons to the collection in the afternoon for distribution to needy families – or their use for the preparation of meals to be served in soup kitchens, or through the activity of meal distribution on the street to the homeless for dinner. Furthermore, the awareness-raising activity of the volunteers of the frontline charities involved was fundamental, emphasizing the important impact from both an environmental and a social point of view, hence, the importance of their contribution in collecting food surpluses from supermarkets – sometimes daily. From this standpoint, sharing the numbers relating to the quantities recovered and the estimates of the potentially recoverable food surplus was an important motivating factor. On the side of supermarkets, it was necessary to specify the type of food that could be included in the donation basket, making use of informative brochures and guides which were developed to raise awareness regarding the importance of careful control of the food upstream – therefore at the supermarket, right when the donation baskets are prepared. Particular emphasis was placed on the importance to pay attention to the presence of the word “*preferibilmente*” – i.e., preferably – in the wording preceding the date on the label. The wording “*consumare preferibilmente entro*” – literally translated as “to be consumed preferably by” – precedes the indication of the best-before date (what in Italian is known as *termine minimo di conservazione*, TMC) – which is very different from the expiry date. As a matter of fact, beyond the best-before date, food products are still safe for human consumption and thus still suitable to be donated to the most deprived – obviously paying the most careful attention to any sign of deterioration, such as the presence of rancid molds and the like, according to the provisions of the manual for correct operating practices for food donation validated by Italian Ministry of Health. Conversely, it is absolutely forbidden and potentially extremely dangerous to donate food after the expiry date – indicated precisely by the wording “*consumare entro*” – literally translated as “to be consumed by”, thus without the word “preferably” (in Italian, “*preferibilmente*”).

Moreover, it was essential to raise the awareness of the staff of supermarkets with respect to the best timing for entering the donation in the *ecibo* platform. This was required to grant frontline charities a greater time buffer to pick up the donation basket and redistribute the food products in it. The ABAR team ensured that supermarket personnel had clear in mind the type of actors interacting on the other side of the platform: volunteers of charitable organizations who make themselves available during their personal time to help people in need. This helped them understand how guaranteeing them more time to organize could greatly facilitate the reconciliation of voluntary activities with their work and personal lives, whereas inserting a donation too late was

significantly increasing the risk of encountering the unavailability of the volunteers. It was also important to underline the storage room of the basket of surplus food, once removed from the shelves and fridges, was absolutely to be kept in the cold rooms until the arrival of the frontline charities for collection. Not least important was to underline the necessity for the delivery note, called document of transportation (DDT), to state the correct quantity and quality of the foodstuffs in the donation basket – which had absolutely to correspond. All these pivotal training sessions were carried out by a human resource hired with a fixed-term employment contract thanks to the project funding, and by the volunteers.

Launch

At the end of February 2021 donations started to appear on the ecibo platform, and with the support of the ABAR team, the number of actors involved started growing. Despite the hardship experienced in recruiting frontline charities, thanks to the resources of the funded project ABAR was capable of engaging new collaborators on the project that could smooth out the issues, as well as acquiring all the necessary equipment for allowing charities to recover surplus food and realizing the informative material to promote the platform (such as leaflets and an official video¹¹). By the end of 2021 only, 64.72 tons of food surplus has been successfully recovered, through donations involving 23 supermarkets and 30 frontline charities around Rome.

	2014	2015	2016	2017	2018	2019	2020	2021
Platform	BeeApp	BeeApp	BeeApp	BeeApp	BeeApp & offline	ecibo	ecibo	ecibo
Frontline charities	3	7	10	5	4	4	4	30
Supermarkets	1	2	3	3	3	3	3	23
Donations	22	96	228	375	414	327	399	2096
Food donated (KG)	354,62	2.205,43	4.502,75	8.464,05	10.741,43	9.025,66	10.936,59	64.726,00

11. ecibo – il recupero “intelligente” di eccedenze alimentari – Associazione Banco Alimentare Roma ODV
https://www.youtube.com/watch?v=x5BhopLO_-M.

Part C: Stasera Offro Io

At the same time when ABAR was working on the implementation of the ecibo platform, the problems underlying the system were quite clear to the team. During 2019, when experiencing difficulties in engaging frontline charities to recover the surplus food from supermarkets by adhering to the ecibo platform, new ideas started to emerge.

The main problem was, again, that frontline charities were not quite incentivized to recover surplus food from supermarkets in multiple, daily pick-ups – especially when it comes to donations of small quantities, when they had always the opportunity to go at ABAR warehouse upon booking, at the time that suit them the most, and get the food supplies they need for providing food to their assisted people in bulk. Back in 2014, out of a network of 300 charities only 10 were interested in the project, and 6 of them eventually dropped out. This was also confirmed later on, during the implementation wave of 2021, when the team had to go to a serious hardship to find the availability of 30 frontline charities. ABAR was confronted with the fact that it was more convenient for charities to stick with the traditional food aid supply chain: For them, collecting daily surplus food at supermarkets was significantly more costly than obtaining, at once, the food supplies required for one-month operations at ABAR’s warehouse.

Such frictions were also at the root of the unsuitability of a platform like ecibo to facilitate the recovery of surplus food generated in the numerous small-sized food business operators such as bakeries, for instance, because all but convenient from a cost-benefit analysis from the frontline charities’ standpoint.

The big idea was then to involve another type of actor in the process, the most deprived people who, by definition, being the ultimate beneficiary of the surplus food, had the greatest incentive for the platform to work. Starting from the foundations of the ecibo platform, the team designed a new platform based on the involvement of the most deprived people as users.

This sparked the genesis of the web app Stasera Offro Io (the Italian for “tonight is on me”, hereinafter, SOI), a radical innovation allowing for recovery of surplus food from small food business operators (e.g., bakeries, restaurants, butchers, fishmongers, etc.), which until then have been untapped by the solidarity chain. The new platform allows recovering daily unsold food products of which can be collected directly by the deprived people: enabled by the frontline charities, the assisted people are actively involved in the recovery of surplus food, under a new model of inclusive assistance that mobilizes the final beneficiaries in the fight against waste, making them active actors in their own exit from the condition of deprivation. It is no longer the food bank, nor the frontline charity that collects food surplus, but rather the people in need themselves, who are enabled to personally collect portioned donations, to be consumed by them under the food aid assistance provided by frontline charities. Thus, people in need, from being known as “*assistiti*” (the Italian for assisted people) become “*invitati*” (the Italian for guests), who are indeed invited for lunch or dinner by donors who, thanks to SOI, make their unsold items available, in an innovative way, for this noble purpose.

In sum, the SOI platform involves three actors in the donation process:

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- Donors, i.e., food business operators who insert the availability of food surplus to be donated, packaged in portions suitable for the consumption need of a family.
- Frontline charities, i.e., charitable organizations that provide food assistance to most deprived people.
- Guests, i.e., persons appointed by frontline charities, who, on behalf of the latter, can collect the donations, as well as be the final beneficiaries of the food recovered, being eligible for food assistance, as part of the food aid that the frontline charity grants them.

The SOI platform was designed for simple and immediate use for all user profiles. In particular, with a few clicks (or taps, as it is accessible via smartphone as well), donors have the opportunity to publish the food surplus generated at the end of the day, by portioning it into a certain number of baskets, each of which will be available as a single donation. In turn, the Guests can visualize the donations as icons on the map of Rome, being able to check their remaining availability and, tapping on it, a description of the content. As long as present on the map, each individual donation basket can be booked by one of the Guests; once a booking has been made, the Guest is then required to collect it within the time range indicated for pick-up.

When the Guest who has regularly booked the donation goes to the donor's shop for collection, the latter checks the booking code held by the Guest and, if correct, delivers the basket of food surplus. Along with the physical delivery of the donation basket to the Guest, the Donor confirms the withdrawal on the platform which, at that point, issues the corresponding document of transportation (DDT).

The frontline charity can monitor the operations made by their Guests and has the right to enable or disable guests. The frontline charities can also check all the DDTs of the donations collected by its guests, which will be used by the system to draw up the declaration at the end of each quarter, which the frontline charity will need to sign and reupload, for the donors to be able to download and use it to redeem their tax reduction.

One of the key features of Stasera Offro Io is the user category of Guests, those who can book and pick up the donation baskets from donors. Indeed, on such side of the platform, not only the most deprived people are found, but it also comprises some of the frontline charities' volunteer. The latter does not pick up the food for their own consumption as the former, but rather collects and redistribute it to the assisted people of the charitable organization they belong, hence their presence is fundamental. Indeed, thanks to the ambiguous nature of the Guest user, when somebody enters the donors' premises to collect the booked donation, the donors cannot be sure whether that person is a volunteer or somebody in need – thereby protecting the information about the precarious condition of indigent people.

In the summer 2020, Stasera Offro Io was initiated as a vanguard project. Once the platform has been developed and tested within the ABAR team, the project team was enlarged with new young

volunteers, and interns of a local University, who were trained during their involvement in the preliminary activities aimed at launching the live experimentation phase.

Everything began by preparing the legal documents – such as the contractual agreements for the use of the platform with donors, frontline charities, and guests – and the informative material – such as the brochures for engaging donors, and the user guides to facilitate training about the platform functioning.

Once everything was sorted out, the team moved to the identification, within the ABAR's network, of the frontline charity that was deemed most suitable to be part of such a groundbreaking initiative in the solidarity landscape. A new frontline charity, that had started its activity of providing food aid to the most deprived that very year as a response to the Covid-19 pandemic, and mostly made of young volunteers, was identified and engaged in the project.

Several sessions of training were held between December 2020 and January 2021, mostly online, with the frontline charity's volunteers about the functioning of the system, and most importantly, their role in engaging the most deprived people they provided food aid to, who had to be involved as active, central actors in the donation process.

Guided and supported by ABAR, the frontline charity started a twofold search: on the one hand, the volunteers started searching for the right people to be included as Guests in the system within the pool of their assisted people – initially picking up five people among those having a smartphone, some digital skills, and that had no problem of mobility; on the other hand, they shared a list of four potential donors featuring bakeries that, during the first and most difficult phase of the pandemic, had already donated something, and other shops that were just located nearby. One of these potential donors, a bakery that really believed in the project, was engaged and trained by ABAR's volunteers.

Five underprivileged people and one volunteer were also trained, each with multiple, extensive sessions involving also repeated trials within the platform's test environment, in order to provide them with all the necessary information to autonomously perform the steps to collect a donation in the real-world.

On 1st February 2021, right along the implementation wave of *ecibo* that was gaining momentum, the experimentation phase of the SOI platform had officially begun, and the first two donations were collected at the donors' premises.

The same week, another bakery was engaged as donor and started donating. However, this donor was receiving less bookings because its premises were more distant from where the Guests involved that far had their homes. In order to prevent the donor from quitting, it has been essential to find a short-term solution with committing more volunteers to collect the food donations – especially for those days in which no bookings were made by guests. At the same time, it has been essential to work on the identification of more Guests in the area to be involved in the platform. By simultaneously working in two directions, namely the gradual engagement of new donors, on one side, and new frontline charities, on the other side, eventually allowed the platform to grow.

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By mid-September 2022, 2000 donations of food surplus, accounting for a market value of 21.367 euros, were made through the SOI platform by 30 donors. These donations were recovered by 84 guests, namely 74 families assisted by 11 frontline charities – who have personally recovered the donated baskets to be directly used for their own consumption – and 10 volunteers of those 11 frontline charities – who have collected the donations to be then distributed to the people assisted by the charitable organization they are part of. ABAR's next step is diffusing the system in the whole territory of Rome, and beyond.