Name Translation as a Machine Translation Evaluation Task

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Abstract

Name translation has proven to be a challenge for machine translation providers, but breakthroughs in related natural language processing technologies may make rapid progress possible in this area. In this paper, we describe the challenges in name translation, which takes on greater importance when viewing machine translation as an embedded component of a translingual process. To show a baseline measurement for this aspect, we then describe a procedure for name translation evaluation, along with preliminary results from an experiment to determine the feasibility of automated evaluation of name translation.

1. Introduction

Evaluation of machine translation (MT) systems remains an open issue in the MT community, despite the proliferation of machine translation products and the proliferation of MT evaluation efforts. Most evaluations rely on human judges to make assessments of the utility and/or readability of the resulting translations. Automation of evaluation is generally even more difficult because there is no one "right" answer and much human knowledge goes into the evaluation process. Recent focus on the automated evaluation of MT more accurately corresponds to the embedded use of MT. Hence, a new focus on automatically computed metrics to assess the quality of the resulting translation has arisen.

There are classes of localized phenomena for which there exists a small, well-defined set of right answers: the set of proper names, and various kinds of numerical expressions such as times, dates, monetary expressions, or percentages. These expressions correspond in part to the so-called "Named Entity" identification task that has been used in the evaluation of information extraction systems for both text (MUC 1998) and audio data (HUB-4 1999). Since names and numerical expressions (particularly dates) carry critical content — content that is useful for summarization, topic identification and browsing—this task provides a good measure of MT systems' ability to capture (or preserve) that critical information.

In addition to providing a possible evaluation metric, named entity translation is an important area of research in its own right, since this is an area where current commercial products have difficulty. However, a number of mono-lingual name identification products now exist for a variety of languages, as well as at least one public domain trainable statistical system (Palmer et al, 2000). This means that automated name identification and by extension, improved name translation, may be well within reach of the research community over the next few years. This paper outlines the challenges in named entity translation and then describes the preliminary results from an experiment examining the tractability of automated name translation evaluation.

2. Proper Name Translation

Proper translation of named entities must ensure that they are a) not translated when they are personal names; b) rendered idiomatically rather than literally, observing standard naming conventions in the target language; and c) rendered in a format that is usable by target language processing. Each of these issues suggests evaluation criteria, which are described below.

2.1. Personal Names

If a user is trying to gather information on Helmut Kohl from both German and English newspapers, but speaks only English, she would want MT systems to facilitate the search. Automated downstream processing assumes that the name has been properly handled by the MT software, that is, translating the name correctly as *Helmut Kohl* and rendering the name in a form usable by English retrieval software. The word *Kohl* is also the German word for *cabbage.* These are confusable in German, because both common and proper nouns are capitalized. A translation engine could amuse, but not be helpful, in returning *Helmut Cabbage.* The first goal of translation, then, is to ensure that personal names are not translated as common nouns, but that certain titles and parts of names are. Evaluation of these translations requires the identification of personal names in the reference translation so that they can be checked in the target text being evaluated.

2.2. Idiomatic Rendering

Another example of rendering problems is the Spanish *escuela de derecho de Harvard;* this is properly translated as *Harvard Law School* but was translated by one system as *Harvard School of the Right.* The idiomatic translation is preferred for institution names. Acronym handling is also included in this family of challenges—some acronyms are translated while others are not. A literal Latin-alphabet rendering of the abbreviation for the former Soviet Union would be the transliteration *SSSR,* whereas it is normally rendered by translating the expression into English *(Union of the Soviet Socialist Republics)* and then reducing the initials to *USSR.* On the other hand, the Basque separatist organization Euskadi Ta Askatasuna is generally rendered as *ETA,* based on the abbreviation of its (untranslated) full Basque name. Thus

the choice of transliteration or translation depends in part on convention. As a result, name translation evaluation requires identifying the names and their types (person names, geographic names, acronyms, etc.) and distinguishing those names (or parts of names) that are translated from those that are transliterated.

2.3. Textual Rendering

Finally, the *rendering* of names must be handled in languages that use characters that have no English equivalent. For instance, some people might render the acronym for the former Soviet Union as *CCCP* (a look-alike Latin-alphabet representation of the characters in the Cyrillic acronym). Rendering can involve translation of diacritics such as German umlauts or French accents, or it can involve other alphabets (Cyrillic, Arabic, Thai) or non-alphabetic writing systems (Chinese, Japanese). In certain cases when a name is not translated, the translation engine leaves it in the original character set (e.g., Cyrillic instead of an English transliteration or transcription). This means that a reader of the translation or an automated processor might miss *Gorbachev*. As Knight and Graehl (1998) point out, however, even uniform transliteration does not guarantee success in name recognition. In their work with Japanese name translation, they show that the process of transliteration across languages can introduce significant errors. The large number of transliterations for *Khadafy* is an example. An evaluation must decide on a representation scheme that reflects later processing needs and then provide guidelines for the rendering of named entities in the target language, and for the comparison of alternative transliteration schemes.

3. Evaluation of Named Entities

Named entity translation can be evaluated more directly than most other kinds of translation, because there is much less flexibility about how to translate a name. For translation in general, there is no one right answer for any given phrase or sentence, which means that evaluations that rely on comparison to a "gold standard" cannot be used. However, for proper name translation, there is generally one "right" answer (or answer class, to allow for multiple representation variants). This allows us to do name translation evaluation that compares target translation to reference translation for names, using a model developed for named entity detection in speech transcriptions. We assume that we have the following:

- NE TASK DEFINITION: A set of named entity guidelines that defines the set of names and numerical expressions to be evaluated (e.g., Chinchor et al. 1999).
- SOURCE: A source text that includes some named entities (not marked).
- REF TARGET: A human "reference" transcription, including the translations of these entities, with the name strings appropriately marked.
- SYS TARGET: The output of a machine translation system from source to target language.
- ALIGNMENT ALGORITHM: An alignment algorithm that can produce a mapping between source and target at the paragraph or sentence level. We use an alignment algorithm instead of indicators provided by individual translation engines because of the variation of alignment strategies and representations in translation engines.
- NAME ALIGNER: A name alignment algorithm that maps, on a sentence-by-sentence basis, the names in the REF TARGET to the corresponding strings in the SYS TARGET. In this mapping, some REF TARGET names will (partially) map to names in SYS TARGET and some may be missing altogether from the SYS TARGET (whether due to failure to translate or to anaphora). There will be many words in REF TARGET that are simply ignored because they are non-name output of the MT system.
- SCORER: A scoring algorithm that counts each named entity in REF TARGET as correctly translated or missing, with some provision for partial credit.

For the purposes of an initial experiment, we wished to test our ideas using several Spanish-to-English MT systems (which we will not specifically identify here). We used a corpus of materials from the AMTA Workshop on Interlingual Representation (Farwell et al. 1998). This consisted of an initial article in English and a human translation into Spanish (see Appendix A).[1] No pre-processing was applied to the data, and only a small amount of post-processing was applied to the resulting translations, to remove system-specific markers. We then proceeded as follows:

1. We ran the Spanish SOURCE through each MT system, to produce an English SYS TARGET
2. We tagged the English REF TARGET (human produced) for named entities and numerical expressions, using the NE TASK DEFINITION.
3. We aligned the SYS TARGET and the REF TARGET at the paragraph level.
4. On the REF and SYS paragraph pairs, we used the name alignment algorithm described below to provide name mappings.
5. We scored the aligned sets of names.

ACCIÓN Internacional es un organismo privado sin fines de lucro con sede en Estados Unidos, que brinda actualmente asistencia técnica a una red de establecimientos de microcrédito en trece países de América Latina y seis grandes ciudades de Estados Unidos. En América Latina la red abarca dieciocho organizaciones independientes que desembolsaron mil millones de dólares en los últimos cinco años en forma de préstamos de una cuantía media inferior a quinientos dólares.

Figure 1: First paragraph of Spanish SOURCE

ACCIÓN International is a U.S.-based private non-profit organization that currently provides technical assistance to a network of institutions in **thirteen** countries in **Latin America** and **six** cities in the **United States.** Its network of **eighteen** independent organizations in **Latin America** has lent over $1 **billion** to microenterprises in the last **five** years, in loans averaging less than $500.

Figure 2: Annotated REF TARGET (entities in bold)

[1] The example text discussed here is available in a variety of languages (including Spanish, French, German and Russian) at http://clr.nmsu.edu/Events/FWOI/SecondWorkshop/text.html.

International ACTION is a non-profit private organization with headquarters in United States, that offers currently technical assistance to an establishments net of microcrédito in thirteen Latin America countries and large six United States cities. In Latin America the net encompasses eighteen independent organizations that disbursed thousand millones of dollars in the last five years in the shape of loans of a mean quantity inferior to five hundred dollars.

Figure 3: SYS TARGET (System 1)

Reference Entities		**System Text**
ACCIÓN International	⇐	International ACTION
U. S.	⇐	United States
thirteen	⇐	thirteen
Latin America	⇐	Latin America
six	⇐	six
United States	⇐	United States
eighteen	⇐	eighteen
Latin America	⇐	Latin America
$1 billion	⇐	thousand millones of dollars
five years	⇐	five years
$500	⇐	five hundred dollars

Figure 4: Hand alignment of REF TARGET entities with SYS TARGET 1

ACTION the International is an organism deprived without aims of profit with seat in the United States, that technical attendance to a network of establishments of microcre'dito in thirteen countries of Latin America offers at the moment and six great cities of States United In Latin America the network includes eighteen thousands independent organizations who disbursed millo- nes of dollars in last the five years in form of loans of an average quantity infe- rior to five hundred dollars.

Figure 5: SYS TARGET (System 2)

Reference Entities		**System Text**
ACCIÓN International	⇐	ACTION the International
U. S.	⇐	United States
thirteen	⇐	thirteen
Latin America	⇐	Latin America
six	⇐	six
United States	⇐	States United
eighteen	⇐	eighteen thousands
Latin America	⇐	Latin America
$1 billion	⇐	millo-nes of dollars
five years	⇐	five years
$500	⇐	five hundred dollars

Figure 6: Hand alignment of REF TARGET entities with SYS TARGET 2

To illustrate this, we show the first few sentences of a Spanish SOURCE text in Figure 1 and the associated (human produced) REF TARGET in Figure 2. Hand-annotated named entities are shown in bold. The corresponding translation produced by "System 1" is shown in Figure 3. Figure 4 contains an alignment of the entities in Figures 2 and 3 that we performed by hand—this is intended to be suggestive of the kind of alignment we wish our automatic procedure to produce.

We can perform the same procedure with a different system's translation, shown in Figure 5, with the resulting hand alignment in Figure 6. In this case, we note several problems—there are some residual errors due to hyphenation and other formatting problems. The two system translations can be found in Appendices B and C.

4. Alignment and Scoring

Given pairs of aligned reference and system paragraphs (or sentences), we wish to score the system's translations of the reference named entities. To do so, we have developed a variant of the word-error metric used to evaluate the output of automatic speech transcription (ASR) systems (Pallett 1989). Unlike the standard definition of word-error, we are only interested in aligning the named entities in the reference. Further, we do not care (at this time) about the order in which the entities appear, although we are, of course, concerned with word order *within* entities.

This alignment problem may be viewed as one of mapping reference entities to spans (subsequences) of the system output. Each such mapping can be assigned a cost, corresponding to how well (or how poorly) the system span matches the named entity (see Figure 7 for examples). Dynamic programming can be used to determine the cost of a span with respect to a system entity. We can also introduce a special empty span. Any entity that aligns with this is entirely missing from the system output, and is accorded a maximum cost, equal to the number of words in the reference entity. The overall problem can be seen as a search for the set of alignments from reference entities to system text spans. We wish to find the minimal cost overall alignment, subject to the constraint that none of the aligned spans can overlap. This can be framed as a linear programming problem, for which efficient algorithms exist. For the purposes of the preliminary exploration that we discuss here, however, we can determine the minimal cost alignments with a simple brute-force algorithm.

Note that, unlike the ASR metric, our error rate can never be greater than 100%, as there is always an alignment with a lower error rate that aligns every word in the system translation against the wildcard word.

As an example of how the alignment and scoring algorithm works, consider the first sentence of the reference source passage from Figure 2. Figure 8 shows a portion of the alignment produced by our algorithm for the output of System 2. The strike marks indicate that no system word aligned with a particular reference entity word, corresponding to a deletion. As we can see from

ACCIÓN International	0	
ACCIÓN	1	(1 deletion)
Action International	1	(1 substitution)
ACCIÓN of International	1	(1 insertion)

Figure 7: Possible alignments for *ACCIÓN International,* with associated costs

Reference Entities		System Spans
ACCIÓN International	⇐	the International
U. S.	⇐	x x
thirteen	⇐	thirteen
Latin America	⇐	Latin America
six	⇐	six
United States	⇐	United States

Figure 8: A portion of the automatic alignment of REF TARGET and SYS TARGET 2

this alignment, the system's second instance of *United States* did *not* align with the reference *U. S.,* resulting in two deletion errors, since *U. S.* is treated as two tokens (we discuss acronyms and related issues in the Conclusion). Also, *the* aligned with *ACCIÓN,* resulting in a substitution error. Equivalently, the reference entity might have aligned with the one-word span for *International,* corresponding to a deletion error for *ACCIÓN.* Given the three errors, and the ten named entity words in the reference, our algorithm determines a "targeted word error rate" of 30% for this sentence. If we score based on named entities, we have an "entity error rate" of 25%: out of 6 entities, one is missing and one gets partial (half) credit.

As described above, we ran both machine translation systems on the full Spanish article (see the Appendices), and then we did paragraph alignment on each system translation against the reference translation. We then ran our evaluation algorithm on the aligned pairs of texts. Because the alignment was at the paragraph level, we ran the software in a mode that collapses all occurrences of identical entities within the unit of comparison (in this case, a paragraph). In this way, translations that differ in the number of identical mentions of an entity are not penalized for what is arguably just a stylistic difference. After this paragraph-level "uniquing" process there were 91 named entities in the reference translation, comprising 126 tokens; 40 of the entities were proper names (65 tokens). Our algorithm produced the results shown in Figures 9 and 10.

	System 1	System 2
All Entities (126)	0.46 (58)	0.42 (53)
Names Only (65)	0.49 (32)	0.46 (30)

Figure 9: Token-based error rates
(raw token counts in parentheses)

	System 1	**System 2**
Correct	0.55 (22)	0.60 (24)
Partial	0.20 (8)	0.18 (7)
Missing	0.25 (10)	0.22 (9)
Error Rate	0.35 (10 + 8/2)	0.31 (9 + 7/2)

Figure 10: Entity-based results
(raw entity counts in parentheses)

5. Discussion and Conclusions

Danielsson and Mühlenbock (1998) discuss the issue of proper name translation in some detail. Their classification of names (not including numeric expressions) is more fine-grained than the one used here (seven vs. three categories). They also distinguish five different ways of treating names, including simple transcription and translation, but also clarification (e.g., adding contextual information), simplification (e.g., acronyms) and omission (e.g., using anaphora instead). In the parallel bilingual corpus that they analyzed, 65% of the names are transcribed, 31% are translated, and only 4% fall into the other categories.

We performed some rudimentary analysis of our data at the level of entities, rather than words. Figure 9 shows that for both systems, over half of the proper name entities matched the reference translations perfectly—we found that most of these fell into Danielsson and Mühlenbock's category of simple transcriptions. Of those that matched partially, most involved genuine translation errors, while a few were arguably perfectly good alternative translations. For those names that were missing entirely from the system translations, roughly half had good alternative translations, including acronyms, a few were omitted or realized anaphorically, and less than half were translated incorrectly. On this basis, we estimate that the corrected error rate is around 25% for names.

Entity translation may be a useful dimension along which to evaluate MT systems, but a number of issues remain. As described earlier, it will be necessary to deal with systematic variations, such as the use of abbreviations *(U.S.)* instead of full names *(United States);* similarly for dates *(May 12, 2000* vs. *5-12-2000)* and currency expressions *($1 billion* vs. *one thousand million dollars).* The currently reported error rates should be seen as over-estimates until the matching portion of the algorithm is improved to deal with these types of variations. Second, it will be necessary to recognize alternate spellings, particularly for names that are transliterated or transcribed from other languages *(Khadafy, Chechnia,* etc.). Third, we need to understand the impact of non-literal translations—what happens when a name appears in the source, but not in the reference transcription? This reflects the fact that human translators do not necessarily perform a sentence-by-sentence translation.

We also need to understand the robustness of both the sentence/paragraph alignment and the word alignment portions of the process and whether they introduce any kind of systematic error. However, despite these issues, we believe that this is a promising approach to providing an automatic quantitative evaluation of translation quality for key content expressions. In addition, it is hoped that this will provide the basis for tools that can facilitate better translation of named entities.

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Appendix A: Original Spanish Text

AMÉRICA LATINA RADIOGRAFÍA DE UNA PROEZA POR MARÍA OTERO

En cinco años BancoSol se ha convertido en un banco comercial especializado en microfinanza.

ACCIÓN Internacional es un organismo privado sin fines de lucro con sede en Estados Unidos, que brinda actualmente asistencia técnica a una red de establecimientos de microcrédito en trece países de América Latina y seis grandes ciudades de Estados Unidos. En América Latina la red abarca dieciocho organizaciones independientes que desembolsaron mil millo- nes de dólares en los últimos cinco años en forma de préstamos de una cuantía media infe- rior a quinientos dólares.

Tres de las instituciones dependientes de ACCIÓN Internacional que han dado mejores resultados, que inicialmente eran organizaciones sin fines de lucro, se han transformado, en los últimos cinco años, en establecimientos de crédito perfectamente integrados en el sistema bancario nacional pero especializados en el sector de la microempresa. Tomemos el ejemplo de BancoSol, en Bolivia.

Nacimiento del "Banco Solidario"

En sus comienzos, en 1986, BancoSol era una asociación sin fines de lucro administrada conjuntamente por ACCIÓN Internacional--que se encargaba de la gestión y proporcionaba el capital inicial--y por representantes de los círculos bolivianos de los negocios, que suministraban apoyo logístico y su conocimiento del terreno. La finalidad del programa (bautizado PRODEM) era ofrecer a los trabajadores independientes más desfavorecidos posibilidades de crédito y de formación para ampliar sus perspectivas de empleo, alentar las inversiones en las microempresas y aumentar la rentabilidad del sector.

PRODEM comenzó prestando pequeñas sumas por concepto de capital de explotación a grupos de empresarios solidarios. Al cabo de cinco años, el programa había otorgado más de 27 millones de dólares en préstamos de un monto medio de 273 dólares, a más de 13.000 empresarios, de los cuales 77% eran mujeres, con una tasa de reembolso próxima a 100% (de los 27 millones de dólares, sólo 2.000 no fueron recuperados).

Entre las razones de este éxito cabe men- cionar la preocupación por brindar un servicio de buena calidad, tanto en el plano de la gestión financiera como de la formación del personal, así como un esfuerzo de información muy importante. A fines de 1991, la cartera de préstamos de PRODEM representaba cuatro millones de dólares, pero es evidente que, pese al dinamismo del programa, éste sólo había favorecido a un porcentaje limitado de benefi- ciarios potenciales.

Frente a la enorme demanda, los responsables de PRODEM, deseosos de ofrecer un servicio de ahorro a sus clientes y de tener, al mismo tiempo, acceso al mercado de capitales para financiar sus operaciones, tomaron la

iniciativa sin precedentes de pasar de la condición de asociación sin fines de lucro a la de banco privado de depósito y de crédito espe- cializado en la microfinanza.

La transición, iniciade en 1989, iba a durar dos años: era preciso, en efecto, constituir el capital social exigido por la ley boliviana, instalar las estructuras financieras, hacer previsiones de rentabilidad, formar personal y ajustarse a los criterios de la Superintendencia de Bancos de Bolivia.

BancoSol abrió sus puertas en 1992, con PRODEM como principal accionista, que había convertido sus cuatro millones de dólares de capital en acciones. Entre los demás accionistas figuraban ACCIÓN Internacional, Calmeadow (del Canadá), que habían contribuido en gran medida a la creación del banco, Fundes (de Suiza) e ICC, rama privada del Banco Interamericano de Desarrollo.

Un éxito fulgurante

Tras cuatro años de actividad, BancoSol cuenta con 29 agencias y cerca de 70.000 clientes, o sea 40% de la clientela bancaria del país. Es curioso observar que aunque las pérdidas del banco siguen siendo sumamente bajas (BancoSol registró en 1994 la tasa más alta de rendimiento de los activos de todos los bancos del país), sus clientes--sobre todo indígenas y en su mayoría mujeres que se endeudan por sumas muy pequeñas--son considerados insolven- tes por los demás establecimientos.

Hoy día BancoSol dispone de una cartera de unos 35 millones de dólares, un cuarto de los cuales son depósitos de ahorristas, y los préstamos otorgados cada año ascienden a 80 millones de dólares, en general por sumas inferiores a 600 dólares y a corto plazo. El banco pretende algún día llegar a cubrir el conjunto del país, desarrollar el ahorro y seguir presentando un balance positivo, pero manteniéndose al servicio de una población que anteriormente no había tenido acceso a los servicios financieros.

El ejemplo de BancoSol es, por lo demás, contagioso. La Superintendencia de Bancos creó, en 1994, un nuevo tipo de institución bancaria reglamentada para permitir que otras organizaciones de ayuda financieramente sanas puedan ser reconocidas como bancos de pleno derecho y extender así sus actividades al sector de la microempresa. En otros países, organismos como K-REP en Kenya, Acción Comunitaria en el Perú y Génesis en Guatemala se esfuerzan por adaptar las enseñanzas obtenidas de la experiencia de BancoSol a su contexto específico y aspiran a convertirse, en un plazo de dos años, en establecimientos financieros reconocidos especializados en microfinanza.

MARÍA OTERO, estadounidense de origen boliviano, es vicepresidenta de la asociación Acción Internacional. Ha codirigido la publicación The new world of microenterprise finance (1994, El nuevo mundo de la financiación de la microempresa) y es autora de varios estudios y artículos sobre el tema.

Appendix B: System l's Translation

LATIN AMERICA: X-RAY OF A PROWESS
BY MARÍA HILL

In five years BancoSol has been converted into a commercial bank majored in microfinanza.

International ACTION is a non-profit private organization with headquarters in United States, that offers currently technical assistance to an establishments net of microcrédito in thirteen Latin America countries and large six United States cities. In Latin America the net encompasses eighteen independent organizations that disbursed thousand millo - nes of dollars in the last five years in the shape of loans of a mean quantity infe - rior to five hundred dollars.

Three of the dependent institutions of International ACTION that they have given better results, that initially they were non-profit organizations, they have been transformed, into the last five years, into credit establishments perfectly integrated in the national banking system but majored in the sector of the microempresa. We take the example of BancoSol, in Bolivia.

Birth of the "Solidary Bank"

In their/its beginning, in 1986, BancoSol was an administered non-profit association jointly by International ACTION - - that take charge of management and was providing the initial capital - - and by representative of the Bolivian circles of the businesses, that were supplying logistical support and their/its/your/his knowledge of the earthly. The purpose of the program (baptized PRODEM) was to offer to the independent workers more desfavorecidos possibilities of credit and of training to widen their/its perspectives of employment, to encourage the investments in the microempresas and increase the profitability of the sector.

PRODEM began lending small sums on account of capital of development to groups of solidary entrepreneurs. Al five-year end, the program had granted more than 27 million of dollars in loans of an amount middle of 273 dollars, to more than 13.000 entrepreneurs, of those which 77% were women, with a next refund rate to 100% (of 27 million of dollars, only 2.000 were not recovered).

Between the reasons of this success fits men - cionar the preoccupation by offering a service of good quality, so much in the plan of financial management as of the training of the personal, as well as an information effort very important. Around the end of 1991, the loans portfolio of PRODEM was representing four million of dollars, but it is evident that, weigh to the dynamism of the program, this only had favored to a limited percentage of benefi - ciarios potential.

Across from huge demand, the responsible for PRODEM, desirous of offering a saving service to their/its clients and of having, at the same time, access to the capitals market to finance their/its operations, took the unprecedented initiative of go from the condición of non-profit

association to that of private deposit bank and of credit espe - cializado in the microfinanza.

The transition, iniciade in 1989, was going to last two years: was accurate, as a matter of fact, to constitute the social capital demanded by the Bolivian law, to install the financial structures, to make profitability provisions, to form personal and be adjusted to the criteria of the Banks Superintendence of Bolivia.

BancoSol opened their/its doors in 1992, with PRODEM as principal shareholder, that had converted their/its four million of capital dollars into actions. Between the other shareholders were appearing International ACTION, Calmeadow (of the Canada), that they had contributed to a large extent to the creation of the bank, you Fuse (of Suiza) and ICC, private branch of the Inter-American Development Bank.

An aglow success

After four activity years, BancoSol count on 29 agencies and about 70.000 clients, that is 40% of the banking clientele of the country. It is curious to observe that though the losses of the bank continue being extremely decreases (BancoSol registered in 1994 the rate most yield certificate of the assets a little of everything the banks of the country), their/its clients - - above all indigenous and for the most part women that are indebted by adding very small - - are considered insolven - ts by the other establishments.

Nowadays BancoSol it has a portfolio some 35 million dollars, a those which quarter are saver deposits, and the loans granted each year ascend to 80 million of dollars, as a rule by inferior sums to 600 dollars and short term. The bank intends someday to arrive to cover the set of the country, to develop the saving and to follow presenting a positive balance, but being maintained to the service of a population that previously had not had access to the financial services.

The example of BancoSol is, furthermore, contagious. The Banks Superintendence created, in 1994, a new sort of banking institution regulated to permit that other organizations of help financially you heal could be recognized as banks to full right and to extend thus their/its activities to the sector of the microempresa. In other countries, organizations as K-REP in Kenya, Community Action in the Peru and Genesis in Guatemala are strengthened by adapting the obtained teachings from the experience of BancoSol to their/its/your/his specific context and aspire to be converted, into a two-year term, into recognized financial establishments majored in microfinanza.

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Appendix C: System 2's Translation

LATIN AMERICA: X-RAY OF A FEAT
BY MARIA OTERO

Into five BancoSol years one has become a specialized commercial bank in microfinanza.

ACTION the International is an organism deprived without aims of profit with seat in the United States, that technical attendance to a network of establishments of microcre'dito in thirteen countries of Latin America offers at the moment and six great cities of States United In Latin America the network includes eighteen thousands independent organizations who disbursed millo- nes of dollars *in* last the five years in form of loans of an average quantity infe- rior to five hundred dollars.

Three of the dependent institutions of ACTION the International that have given better results, than initially were organizations without profit aims, have become, in last the five years, establishments of credit perfectly integrated in the national banking system but specialized in the sector of microempresa. Tomemos the example from BancoSol, in Bolivia.

Birth of the " Shared in common Bank "

In its beginnings, in 1986, BancoSol was an association without aims of profit administered jointly by ACTION International-that was in charge of the management and provided the initial-and capital by representatives of the circles Bolivians of the businesses, that provided logistic support and its knowledge of the land the purpose of the program (baptized PRODEM) was to offer to the independent workers more desfavorecidos possibilities of credit and formation to extend its perspective of use, to encourage the investments in the microempresas and to increase the yield of the sector.

PRODEM began lending small sum by concept of capital of operation to groups of shared in common industralists Al end of five years, the program had granted more than 27 million dollars in loans of an average amount of 273 dollars, to more than 13,000 industralists, of who 77% were women, with a rate of reimbursement next to 100% (of the 27 million dollars, only 2,000 were not recovered).

Between the reasons of this success men- is possible to cionar the preoccupation to offer a service of good quality, as much in the plane of the financial management like of the formation of the staff, as well as a very important effort of information To 1991 ends, the portfolio of PRODEM loans represented four million dollars, but it is evident that, in spite of the dynamism of the program, this one had only favored to a limited percentage of potential beneficiaries.

As opposed to the enormous demand, the people in charge of PRODEM, eager to offer a service of saving to their clients and to have, at the same time, access to the market of capitals to finance their operations, took the initiative without precedents to pass of condici'o'n of association without aims of profit to the one of credit and deposit private bank espe- cializado in microfinanza.

The transition, iniciade in 1989, were going to last two years: it was necessary, in effect, to constitute the share capital demanded by the law Bolivian, to install the financial structures, to make forecasts of yield, to form staff and to adjust to the criteria of the Supervision of Banks of Bolivia.

BancoSol opened its doors in 1992, with PRODEM like main shareholder, who had turned his four million dollars of capital corresponding to issued stock. Between the other shareholders they appeared ACTION the International, Calmeadow (of the Canada '), who had contributed to a great extent to the creation of the bank, You found (of Switzerland) and ICC, deprived branch of the Inter-American Bank of Development.

A flashing success

After four years of activity, BancoSol counts on 29 agencies and near 70,000 clients, that is 40% of the banking customer of the country Are peculiar to observe that although the losses of the bank continue being extremely low (BancoSol registered in 1994 the highest rate of yield of the assets of all the banks of the country), his client-on all natives and in its majority women that are become indebted very by sum small- they are considered insolven- tes by the other establishments.

Nowadays BancoSol has a portfolio of about 35 million dollars, a quarter of which is deposits of ahorristas, and the granted loans every year ascend to 80 million dollars, in general by sum inferior to 600 dollars and to short term the bank tries some day to arrive to cover the set with the country, to develop the saving and to continue presenting/displaying a positive balance, but staying to the service of a population that had previously not had access to the financial services.

The example of BancoSol is, by the others, contagious the Supervision of Banks created, in 1994, a new type of banking institution regulated to allow that other financially healthy organizations of aid can be recognized like banks of right plenary session and to thus extend their activities to the sector of microempresa. In other countries, organisms like K-REP in Kenya, Communitarian Action in Peru and Ge'nesis in Guatemala makes an effort to adapt the lessons obtained from the experience of BancoSol to their specific context and aspires to become, in a term of two years, specialized recognized financial establishments in microfinanza.

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