Total-Reflection X-Ray Fluorescence Analysis had been developed in Japan, Austria and Germany in the 1970ties. In comparison to conventional XRF techniques TXRF has its own history and special peculiarities. Today it is a self-contained method established in the community of elemental spectroscopy. At the last conference TXRF 2013 in Osaka it was noticed that the number of TXRF spectrometers, their distribution around the world, and the percentage of its applications are unknown so far. But reliable answers seem to be important in order to assess the perception and strength of TXRF. For that reason a survey was carried out among some 100 conference attendees, many colleagues and several instrument manufacturers.

Corresponding to the survey TXRF users generally come three groups: from universities or scientific institutes, from working places at synchrotron beamlines, and laboratories in semiconductor fabs. Actually TXRF instrumentation is distributed in 57 countries of 6 continents and is applied at about 500 institutes and laboratories. The number of the first group of TXRF users mostly running desktop instruments amounts to nearly 300. Working places at synchrotron facilities dedicated to TXRF investigations were not registered by the survey, but the number of this second group could be estimated to be about 60. The third group of TXRF users is represented by chemical laboratories, especially in the semiconductor industry with particular interest in wafer control. The number of running instruments – generally floor-mounted appliances – was estimated to be about 300 installed in about 150 semiconductor fabs. Some remarkable data will illustrate the importance of TXRF in the wafer industry.

The survey gave minimum estimations, more exact numbers could not be obtained because of sales' secrets. All the data were evaluated statistically and have been demonstrated by world maps showing the distribution of today's TXRF equipment.

Furthermore, 13 different fields of applications could be registered from different aspects. With respect to its capabilities, TXRF has surpassed conventional XRF by far and has attained a leading position in atomic spectroscopy. The outstanding features compete very well with those of ICP-MS (Inductively Coupled Plasma–Mass Spectrometry), of ET–AAS (Electrothermal–Atomic Absorption Spectrometry), and INAA (Instrumental Neutron Activation Analysis). Some examples for the strength of TXRF in comparison with these competitors will be demonstrated.

A recent trend of TXRF development goes towards a combination of different spectrometric methods with total-reflection geometry. The new methods are TR-XRR (Total-Reflection X-Ray Reflectivity); GI-XRF (Grazing Incidence X-Ray Fluorescence); GE-XRF (Grazing Exit X-Ray Fluorescence); TR-XRD (Total-Reflection X-Ray Diffraction); and TR-NEXAFS (Total-Reflection Near-Edge X-ray Absorption Fine Structure). All these methods benefit from a reduced background at grazing incidence and lead to an improved structure or species analysis. Impressive examples for applications will be given.