Introduction

The earth is an actor network consisting of different heterogeneous and unstable actor networks. These actor networks are interconnected biologically, chemically, and physically. These networks are numerous and they shape the world, as we know it today. Even our existence depends on the interconnectedness of these actor networks. For example, plants and humans are different, and one of the ways they are interconnected is via the exchange of carbon dioxide and oxygen between themselves. Therefore, it is hard to imagine the existence of humans without plants. Nevertheless, the interconnectedness of the different actants in the earthly actor network provides the balance that sustains life and human activity on earth. An imbalance in one of the networks has an effect on other actor networks within planet earth. The effect could either
be a positive or negative. An example of an imbalance with a potential negative effect is that of global warming. Environmentalists have identified the industrial activities of man as one of the reasons for the global rise in temperature. This rise in temperature has an effect on biodiversity (D’Amen and Bombi 2009), melts the polar ice (Hanna et al. 2008), affects our weather patterns (Vidya et al. 2020), which affects can directly affect our agricultural sector as well as our economy (Chen 2019). These endangered areas are inscribed actor networks. Other imbalances could produce mixed effects. An example is the imbalance created by the current COVID-19 Pandemic. Currently One million people are infected globally and the COVID-19 or Corona virus is very contagious (Kooraki et al. 2020). The actions of this virus had an impact on as the global economy (McKibbin and Fernando 2020); work place practices and inter-human relationships (social distancing) (Dingel and Neiman 2020), relationship with the environment and human interaction with drugs that relieve flu symptoms has been affected (Goodman and Giles 2020), etc. The list of inscribed actor networks is infinite. However, one of the positives is that the lockdown measures imposed by national governments around the world have resulted in Smog free cities (Brandon 2020). Furthermore, research has indicated that there was a correlation between clean air and the reduction in the spread of the virus (Sterpetti 2020). Nevertheless, the point is that isolated actor networks do not exist. They are connected either physically, chemically, or biologically. They are also unstable, volatile, and heterogeneous.

Despite the interconnectedness, most of these actor networks evolve socially if either human or living things that are non-human actors has influence on the network. The actor networks with greater social evolution are human influenced actor networks. Human led actor networks are diverse, unstable, dynamic, and always evolving. This is because humans possess the desire to push boundaries. Human influence on actor networks often result in their emergence of as the focal actor in such an actor network. This is because humans, based on higher intelligence possess and exhibit the capacity to destabilize and recreate new actor networks out of existing actor networks inorder to achieve their desired goals. This has been the attitude of humans from pre-historic Paleolithic (early Stone Age) times date. Hence, humans have largely monitored,
governed and have tried to exert control over the biological, chemical, and physical actor networks on planet earth. Largely they have carried out this task as the focal Actor in the global actor network ethically. Obviously they are yet to govern force majeure, but it could be a matter of time. Anyway, on a global scale humans can be termed “guardians of the earth.”

Over the ages, the achievement of humans in emerging as the global focal Actor has been enabled by their reliance on technology. Interesting the aid of technology, humans have created an interconnected world where elements from chemical and biological actor networks are now interacting in a mutually inclusive network. In the previous power relationship dynamics, between humans and technology, humans conscript technologies into their(human) actor network. In these actor networks, the role assigned to technology by humans was to mediate change that would result in the upgrade of various human civilizations. Today human civilization is so advance in such a way that mundane technologies have evolved into automated technologies. This has resulted in humans gradually weaning technology from its previous role as a mediator of change towards becoming the governor of change. Humans wean technology by gradually granting technologies the autonomy to govern and conscript actants into existing actor networks created by humans. The autonomy also enables technology to conscript actants to create new actor networks. ANT opposes this idea, as actants do not impose their will on other actants (Callon 1980). However, this chapter differs with ANT on that bit. This difference of opinion does not invalidate other aspects of ANT, it rather highlights an aspect evident in actor networks that is ignored. Nevertheless, the interconnected world inherited from nature and upgraded by humans (with the aid of technology) is gradually becoming a technology driven world. This implies that the power-relationship between technology and humans in the global actor network is changing. This also implies that our view on social translations in the future will be different from how we view it today. Obviously, this transformation will have an implication on how we study the social translation. Currently researchers have recognized the important role of automation technologies such as AI and Robots in contemporary actor networks (Richardson 2015; Shaw-Garlock 2011; Griffin et al. 2020)
and some have proposed the identification of these technologies as social actors (Reed 2018). This is a great start.

However, the gap in literature is the implication of the aforementioned changes to the study of social translations. One of the most common frameworks for the study of social translations is the 4 moments of translation by Michel Callon (Callon, 1986). This work provides an outline on how social translation takes place. This piece of work has grained traction due to its relatability to observed network interactions in other fields other than sociology. However, the inspiration for Callon’s work was the human driven actor network. Currently we are gradually moving toward autonomous technology driven actor networks. Such autonomous systems exist. This implies that the four moments of translations may or may not be adequate to study social translations for these autonomous systems led by the new “social actor (technology).” Hence the rhetorical question that comes to mind is, will the four moments of translation hold true when technologies become “masters of the Universe”? An attempt will be made to provide ideas on what the answer to this question might be. However, the ultimate aim of this chapter is to draw attention to the need to revisit sociology of translation in light of the changing reality as described. This chapter tries to set the scene for related research in that area.

This chapter is divided into 5 sections. The introduction is followed by an overview of the 4 moments of translation. This is followed by a depiction on the shift in power relationship from humans to technology. The section provides a brief snapshot of this shift in power relationships from prehistoric times uphill the information age. That section is followed by a discussion on the effect the elevation of technology, as a focal actor, in current actor networks will have on the how we view sociology of translation. The section adopts a present and futuristic approach to the implication. The last section is the concluding part of the chapter.

Four Moments of Translation

The concept of translation, as used in ANT, is open to interpretation (Latour 1996; Law 2009; Gross and Sonnberger 2020). One of the approaches to translation highlights a process where either an
actant or a group of actants emerges as spokespersons for black boxes consisting of defined and interlinked entities (Shiga 2007). The emerging spokesperson from the transformation process could be a human, a non-human, or an inhuman actant. This approach to translation is derived from the work of Callon (1986). Although there are different sociological approaches towards describing translation (Shiga 2007), Callon’s work provides a somewhat systematic approach on how to approach translation. It is important to note that his work was not aimed providing a universal framework that highlights moments of translation. Rather his aim was to describe the moment of translation from an observable phenomena. It turns out however that Michel Callon is not the only individual that has observed these moments of translations. A great deal of Callon inspired researchers, not just sociologists, have identified the four moments of translations in social systems (example Meurer Sela et al. 2020), technical systems (example Chitanana 2020), and socio-technical systems (example Harker and Twum-Darko 2020). Furthermore, in our world today, these moments of translation can be identified in the evolution of human and non-human activities. Such activities include production processes, service delivery processes, and policy development processes, just to name a few. The non human activities can be observed in biological, nanophysical, technical and business ecosystems, etc, just to name a few.

A brief overview of Callon’s moment of translation is as follows. Callon (1986) highlights 4 moments of translation. These are problematization, Interessement, Enrolment, and Mobilization. Problematisation is the first stage. This process is led by a focal actant. The focal actant could be a single or a collective actant. The focal actant identifies the problem, its solution, and the relevant actants needed to solve the problem (ibid.). At this stage, the focal actant creates an indispensable Obligatory Passage Point (OPP). The OPP defines the action program and the relationships that need to be established between the actants. The OPP forms the basis for which the focal actor negotiates with other actant in order to conscript them into the actor network. The second stage is the Interessement phase. Here the primary actant negotiates with the needed actant to get them to accept the roles assigned to them in
the OPP (ibid.). The third stage is the enrolment stage. This stage highlights a successful interessement stage. That is because at this stage the actants accept the roles assigned to them (ibid.). If the interessement stage is unsuccessful, the actor network formation process either stalls or collapses. The last stage is the mobilization stage. This is a stage where representative actants emerge as spokespersons for black boxes in the actor network (ibid.). The representative actant could be either one or more than one. Hence, the mobilization stage is a successful enrolment stage.

Despite the wide adoption of the four moments of translation, this framework is without its deficiencies. It is evident that this framework is a high-level abstraction of the process of translation, hence metatheoretical. The four moments of translations are well defined. However, the intricacies of these four moments of translations are subject to interpretation as there are no defined rules governing the processes identified in each stage of the translation. Another deficiency is that the framework seems to diminish the role of power-relationships in the translation process. As mentioned earlier, ANT ignores inequality in the actor networks, but inequality actually exists between the actors observed in Callon’s work. For example, in the work of Michel Callon, there is a fundamental uneven relationship between the fishermen and the scallops. The scallops are coerced to anchor not because the fishermen are environmentalists and intend to create a peaceful home for the scallops. No scallops are slaves to the fishermen. Their duty is to anchor reproduce and become fished by the fishermen. Hence there is an issue of inequality there. The fact that not all actants are equal is evident in the interessement phase. This is because there are schools of thought that indicates that the focal actor could coerce other actants into the actor network (Tatnall 2001). Coercion denotes power relationships and that should have been expressed in Callon’s work.

However, despite these deficiencies, the framework is still valid for analyzing high-level abstractions of moments of translations. The latitude of thought enabled by the theory fits the purpose of discussion in this chapter with a high-level abstraction of thoughts as well. In this chapter, the focus is on the age-old power-relationship that exist between humans and technology in the process of advancing human civilization.
In actor networks where these two actants coexist, humans are always the focal actors guiding the translation process. This is because humans develop the technology they need as well as interese other actants to solve problems. However, as the relationship between humans and technology advances, there has been a gradual shift in the power-relationship toward making technology the focal actor in the translation process. This will obviously have an impact on the future validity of the four moments of translation and the power dynamics between humans and technology. In the next section, the four moments of translation are used as a reference framework for the discussion on the evolving relationship between human and technology within the context of the four moments of translation.

The Evolving Power Relationship Between Humans and Technology

Before discussing the implications of the evolution of power relationships between humans and technology, it is necessary to provide an overview on how the evolution occurred. From time immemorial, humans utilized technologies to assist in the fulfilment of specific tasks and processes and visions. Technologies, when enabled by humans produce or induce action. Hence, they are actants, but actants that perform the bidding of humans and not theirs. Once they are enabled by humans to act independently in any actor network, they possess agency. However, if they need human support in order to perform an action, that agency is reduced. The need for human has been the case until recently as will be discussed later. One can identify this point of contention as the bias in the chapter. Nevertheless, the power relationship between both actants has been unequal and mostly favoring humans.

As implied in the previous paragraph, the inequality in the relationship between humans and technology has been a constant from pre-historic times until recently. Although technology has been a critical ally to humans, the interessement of technology into actor networks by humans has been coercive. The coercive nature of the interessement process is evident either, in the invention process of the new technology;
the upgrading process; the innovation of existing technologies; or in the re-invention of a technology to fit the task for which the human intends for the technology. If one could recall in eons past most technologies then were forged in hell blazing furnaces. The product of the coerced interessement has been an upward trajectory in the proliferation of new technologies that has enabled the advancement in the development of human civilization.

However, despite the inequality in power relations between both actants the strength of their relationship has been on the increase from pre-historic times until date. This strength has been enabled by the efficiency of technology in enabling humans to advance their civilization. This positive feedback from technology and trust in technology by humans resulted in the gradual over-reliance of humans on technology. This over-reliance and trust resulted in humans gradually relinquishing the reins of their actor networks. This is evident in governance (Paulin 2020), the banking sector (Kaur et al. 2020), manufacturing (Zhang and Yang 2020) and even in our homes (Rahimi et al. 2020), etc. Hence, the scale in the power relationships is actually tipping toward technology controlling human actor networks and invariably controlling human activity. This implies that someday, if it is not happening now, that technology will have the right to conscript and control human actions in certain actor networks. Let us take a very brief trip back in time to take a snapshot that could provide a rough sketch of how the over-reliance on technology led to a gradual shift in the power relationship between both actants.

If one looks back into pre-history, then the encounter and interaction between humans and technology were nascent. Humans were still primitive but also exploring their environment, driven by the necessity to overcome the challenges posed by nature against their existence. The accidental discovery of fire and the potential to create tools out of stones was human’s first encounter with some form of technology (Wrangham and Gowlett 2018). Overtime, humans could develop different forms of technology from iron (Schmidt and Avery 2013), as well as copper, and bronze among other (Ottaway 2001). Using the technology tools developed, pre-historic humans created artefacts from stones copper and iron that enabled humans to transition from foraging to “cultivation
and animal husbandry” (Bar-Yosef 1998) as well as create shelter (Barber 1991). Hence, technological tools developed at this time were aimed at enabling human survival. However, from the dawn of history through antiquity up to the middle ages, technology—slowly but gradually—evolved from being a means of survival to a tool for advancing civilization via conquest, architecture, and the stratification of social structures. The following points provide a brief snapshot of the evolution using selected ages (point of references) in history.

1. The dawn of history: At the Neolithic (new stone age) period, there was the wide scale uptake of agrarian and animal husbandry and less reliance on hunting by humans (Hole 1984). This period saw the uptake of agro-technology by humans (ibid.). However, different regions transited from pre-history into the Neolithic age at different times (Putterman 2008). Hence, the moment and process of the adoption of agro-technology by humans, across regions, differed. Nevertheless, the OPP for the adoption of agro-technologies was to scale up food production, not just for families but also for emerging communities. The social alliance of then hunters turned farmers resulted in communities (Bar-Yosef 1998). The alliance enables the communities to exploit a vast amount of territories for agriculture as opposed to one family (ibid.). The period also saw the uptake of technologies used in making pottery (Bellwood 2004). Hence, the need for innovation was critical and humans had to constantly create OPPs of which technology was a critical actant.

2. Antiquity: Another interesting point of reference is the antiquity. In between the Neolithic period and the antiquity, human society had evolved from agro-based society to organized societies. Within this time period, technology became a tool used to provide social amenities such as the building of aqueducts, water baths, public gardens, transportation, housing projects, and roads; the architectural expansion cities in empires such as Assyria, Persia, Babylonia to name a few; and the development of war machines, etc,. Therefore, by the antiquity humans had grown used to the importance of technology. This led empires in the antiquity such as Roman and Greek empire in exporting their technology and civilization to territories
they conquered (Curchin 2014; Jones 1964). The importance placed on the role of technology in upgrading civilization resulted in the elevation of technology within human led actor networks. This is because technology was not just a mediator but also a spokesperson in the actor network, displaying the civilization. This was evident in different inscribed actor networks, such as art, architecture, monuments, war machines, mode of transportation (both land and sea) and in water management, sanitation, etc. However, just as in the Neolithic Age and the ages in between, humans created and governed the OPP for these actor networks.

3. Middle ages and Renaissance: The middle ages or medieval times and the renaissance, are another points of reference due to the emergence of simple machines and hydraulic engineering, etc. (Mokyr 1992). Obviously previous mechanical artifacts that were present in antiquity and even in the archaic ages inspired these machines (ibid.). Therefore, the ideas were not new, rather these simple machines were either an implementation of these ideas or an innovation of existing inventions. It is at this age that humans began granting semi-autonomy to machines in human led actor networks. However, machines that gained the semi-autonomy operated in niche actor networks which required intensive human labor. Examples of such self-operating machines included flywheel, printing press (Mokyr 1992), etc. Aside the simple machines there are other non-machine technologies such as gunpowder (Khan 2004), horseshoe (Wigelsworth 2006), mechanical clock (Mokyr 1992), etc. among other that were invented.

These ages also saw greater diffusion of technology and culture. In Antiquity, the intermediaries that enabled the diffusion of these technologies in other human led actor networks in other countries and regions were war and travel. Both intermediaries enabled a mediator “ideas” about technologies to diffuse easily to newer civilizations. A good example is the diffusion of the art of making Gunpowder and the printing press from the East (China) to the West (Khan 2004; McLay 2011). The trajectory of the diffusion of Gunpowder from China to the West was wars (McLay 2011). Other examples are the description of technologies Marco Polo encountered in the East and the inspirational drawings of Leonardo Da Vinci. These descriptions
served as inspiration for the replication of such technologies in other jurisdictions. Technology still emerged as one of the spokespersons in human led actor networks. However, there were parallel humans actor networks that were expounding and documenting the science behind the technology. A part of the influence to this parallel actor network was ancient Greek Philosophies. The spokesperson in that network was science. While the spokespersons in actor networks involving technology was innovation.

4. First industrial revolution: However, after the Middle Ages and the renaissance, Humans had interresed science into actor networks aimed at advancing human civilizations. In the first industrial revolution, Science enabled became a mediator, which enabled the greater potentials of technology to be unveiled resulting in, semi-autonomous operating, mechanical, electrical, wind, and water driven technologies. Therefore, the role of technologies in different actor networks was elevated. This was evident in manufacturing, agriculture, mining, transportation, city planning, etc. Hence technology became an active partner with humans in the upgrade of human civilization. Humans operating industries were able to, attain competitive advantage, lower their production overhead costs as well as maximize profit. These benefits occurred because the use of technology implied the reduction in work force needed to perform factory functions, in which the technology was more efficient in performing. On the other hand humans also had access to innovative technologies such as the gramophone (for entertainment), home electricity, advanced carriages, house plumbing, etc. One could say that the semi-autonomy granted to technology by humans resulted in the modernization of societies, hence modernization became the spokesperson of the actor networks where technology was involved. Nevertheless, it was in the industrial age that the age-old relationship between humans and technology was strengthened.

5. Second Industrial revolution: The active partnership between human and technologies became stronger in the second industrial revolution. This was the age where Information and communication Technologies (ICT) were developed and technology was used to modernize society. Such modernization efforts include extending the supply of
electricity; extracting and refining petroleum; and the development of Steel. However, the technology that would revolutionize the relationship between man and technology in a very significant way was the ICTs. ICTs emerged due to the innovations that emerged from the telegraph and electronic tabulation (Williams, 2020a). The telegraph became an inspiration for long distance communication. While the Electronic tabulator was the inspiration for machines that can handle complex computations. By the end of the second industrial revolution, these technologies were found useful by government agencies, industry stakeholders (Williams 2020b; Census.gov 2018), and citizens. It is important to note that citizens used more of the electric telegraph. The electronic tabulators were mostly for government agencies. Nevertheless, this was the moment in history where humans began developing an OPP toward a technology driven world enabled by ICTs.

6. Transition between the second Industrial revolution and Information age: This was a transition period in the relationship between humans and ICTs. The aim was to interesse technology into the OPP developed at the end the second industrial revolution by human industrialists such as Alexander Bell who envisioned telephones for all (Compaine and Weinrub 1997). This period in human history is characterized with the imposition of the will of humans on ICTs. The idea was to develop ICTs that will become the major drivers of society. It is within these periods that visions about Artificial Intelligence, robotics, wireless telephony, the various technologies of the current World Wide Web were planned (CHM 2019). Technology was coerced in different research based actor networks by humans to produce the necessary actions that will lead to the manifestation of the world envisaged by humans. This is still the case today. The research networks involved those of the natural sciences, social sciences and humanities, and medical sciences. The spokespersons of the different actor networks were ICTs that drive other technologies; ICTs that support e-government and e-governance; Technologies that support media rich remote communications; new business models; electronic commerce; and evolved sciences. These spokespersons ushered the
world into the Information age and became actants in the information age themselves.

7. Information age: This age saw the interresemment of and enrolment of the ICT spokespersons in the previous age into different global actor networks. For the first time in the world's history, there was a global effort to facilitate the aforementioned interresemments and enrolments. Inscribed networks such as International Governmental Agencies, national government agencies, donor agencies, and continental governance agencies developed global, regional, and national OPPs, where technology was identified as an enabler (a mediator) for sectoral and societal development. They utilized Intermediaries such as regulations, policy, organizational change management procedures, institutional change management procedures and regional change management procedures enabled the diffusion of ICTs (Blackman 1998). They also provided financial incentives and deployment incentives as mediators to attract researchers and ICT providers toward the deployment of ICTs in various jurisdiction around the globe. These incentives enabled these researchers and ICT providers to research into more advanced technologies as each of them were eager to outdo the other. As a result, toward the end of the information age, basic ICTs enabled by mobile telephone networks existed in every part of the globe.

As ICTs diffused, around the globe, toward the end of the information age humans developed new socio-cultural ways of life. This was because ICT services bridged diverse cultures around the globe, so humans could choose how they want to behave. They now had a new identity or persona. Hence a new global community emerged called the Internet (not the technology). Hence phrases like, “the internet went wild” or the “breaking the internet” or the personification of the internet such as “the internet does not agree with you” are now common. Hence, technology has been able to create new social actor networks. The most common and the biggest being “the Internet” (not the technology). Subset of “the Internet” includes “youtubers,” “Facebook family,” and twitter “hash tags” to mention a few. Aside the Internet as a whole, platforms like Facebook and Youtube have become a platform where people share emotional details of their lives.
It is unheard of in time past, as you share details about your life to, not just friend, but very close friends. The reason for this act is because, most people do not have physical friends they can trust but they trust the unknown stranger “friend” whom they have never seen. These are examples of how technology has reframed our social lives. There are myriads of other examples, online dating, online protest being one of them.

Similarly, the gradual use of ICT had an effect in the business world. First of all cash was no more the only legal tender. There were alternatives such as mobile pay, mobile money tokens, and even cryptocurrency. Aside that, the ability of ICTs to control and manipulate other technologies implies that there were certain actor networks in the business world, Technology could handle. These potentials resulted in:

- the greater adoption of e-commerce;
- the employment of less human help by Small and Medium Scaled Enterprises (SMEs);
- the emergence of new and emerging business models;
- the potential for networking between companies locally and internationally;
- the portable deployment and movement of assets;
- the possibility to outsource and collaborate with other companies in real-time;
- and the use of ICT for managing partners, customers, transactions, tasks, processes, and production.

Furthermore, ICTs are now integral parts of research. It is the tool for statistics, forecasting and predictions; monitoring and the evaluation, modelling of digital twins; the modelling of various other global actor networks, be they physical, chemical, or biological. In different sectors of the economy there are myriads of examples where some ICT is used in an actor network. In other words, ICTs are pervasive (Blackman 1998) in most sections of society. Hence, one could say that ICT in the Information age has fulfilled a part of it role in the OPP designed by various human visionaries at the end of the second
industrial age. However as human relationship with ICTs and other technologies grew, so did trust in technology by humans.

8. Automation age: Today we are in the automation age and the same global actor network that helped the advancement of the information is playing a part in the fulfilment of the promise of the age. But the grand plan is far from being achieved. Nevertheless, in many actor networks, ICT enabled machines or robots are in control. This implies that industry players are far ahead of the global network. Currently some factories are fully automated. The society and homes are still lagging but some are automated. The result is the emergence of smart cities and smart homes. Although technology controls some of the actor networks humans are still in control of the actor networks and technology still exhibits soft power in general. Nevertheless, humans are now increasingly relinquishing control technologies such as AI, Robots, and even Blockchains. OPPs are created for these technologies, which grants them powers to control actor networks such as transaction-based actor networks, Operational-based actor networks, governance-based actor networks, and even actor networks that are social networks. These technologies are designed to accept or reject human intervention based on pre-defined interesement and enrolment criteria. Let us take Blockchain as an example. Blockchains were originally developed to enable secured transactions, transparency, and trust between untrusting partners (BlockchainHub 2018). It creates an OPP where the operations of each partner are visible to the other partners. Hence, it is easy to track, trace, and validate transactions and processes. However, in a situation where the human actors on the Blockchain validate a wrong transaction or process, once that transaction is added to the Blockchain, it is deemed valid. The human stakeholders cannot intervene, as the Blockchain does not permit erasure. If humans try to change the hash key, it messes up the Blockchain altogether. However, despite the existence of this OPP, Blockchain is adopted by government agencies and industries around the globe (Chandler 2019; Anwar 2009; Mearian 2019; Werwitzke 2020; TE-FOOD 2019). Another example is AI, in the case of AI, once their OPP is set, it is left for the AI to govern the actor network using that OPP. Human intervention is not here.
In summary, if we look back through the ages, it is obvious that humans have imposed their will on technology. The imposition of “this will” shapes technology to fulfil its role in the intended actor network. However here at the automation age, humans are gradually diminishing their role in preference of technologies in actor networks. Hence, humans are transiting into a technology driven life. A fully technology driven life is on its way, as will be discussed later. Nevertheless, the transition in the power relations implies that we are moving into a new world where human operations in actor networks will be governed by technology. Imagine having a robot police arresting you for a crime. However, as this change occurs, what does this mean for sociology of translations? Will robots and AI still problematize, interese, and enroll? That is reflected upon in the next section.

**Implications of the Evolving Power Relationship to 4 Moments of Translation**

As highlighted in the previous section, some ICT enabled technologies exerts soft power over humans. As discussed, this is not a subtle takeover of planet earth or a plot from a sci-fi movie. Rather humans have granted soft power to technology. Humans do so based on trust. Furthermore, they currently assist some of the technologies in the sociology of translation process. Hence, as long as humans program technology, problematization, interessement, enrolment, and mobilization will always be part of the actor network even when technology is the focal actant. Humans have always been able to engrain these moments of translation in the process of developing technology. They can do so by adding supporting information based technology to the main technology or they co-share the responsibility of leading the actor network with the technology. Let’s take a look at how that could work.

The different ways humans assist the translation process are as follows:

1. Problematization: From the 2000s, most ICT technologies have been developed with default OPPs. This implies that the technologies are developed not to just support existing industry but revolutionize
the industry. That will imply the adoption of new business models (Makridakis 2017; Bloem et al. 2014). The catch though for businesses is the potential toward becoming competitive and making profit (ibid.). Hence existing businesses, lured by this promise often neglect existing technologies to adopt the new one with its new business model. This trend is evident in the influence of technologies such as the mobile technologies (3G, 4G, and now 5G), computing technologies (Blockchain, cloud computing, etc.), sensor based technologies, Artificial Intelligence (AI), and robotics. However, so far quite unlike that witnessed in the 4 moments of translation (Callon 1986), there are two partner focal actants. That is the human and the technology. The human problematizes and develops the OPP while the technology embodies the OPP. The human who produced the technology is a temporal focal actant, whose leadership ends after enrolment while the technology is the permanent focal actant whose leadership continues until the actor network breaks down. Any human who is not the producer of the technology is a mediator in the network. They are unable to tamper with the OPP.

2. Interessement: Unlike the problematization process, the involvement of the human producer here is limited. However the partnership continues. The interessement process is a joint action by both actants. Examples of joint actions could be road shows, advertisement, etc. where the human speaks and the technology performs. However, despite the joint action, the technology ultimately decides if the interresed actant can join the technology driven actor network or otherwise. This implies that if the human focal actant attempts to interreses an artifact or another human that does not comply with the rules of the OPP, the technology will bar that entry. For example, an AI system controls the door to a mall and that door has to scan only human eye pupil to grant access to a single customer per time. Assuming the owner of the mall who installed the door invites everyone in town to visit the mall and a young boy shows up with his dog, he will enter the mall but his dog will not have access. That is because the robot was designed to scan human eye pupil. Hence, in this case, the AI overrides the owner of the mall, who forgot to announce that pets are not allowed in the mall. Another example is
a self-driving car. There will be rules for starting, driving, and stopping self-driving cars; humans will sell the self-driving cars. Assuming the would-be buyer fails to obey the rules, the car will not drive. The partnership between the focal actants is not a panacea for a successful interessement. This is because interessement is not always guaranteed.

3. Enrolment: The role of the focal human actant diminishes here. In the event that the interessement is successful, then all actants involved will begin to play their part. Further negotiations are needed here if an actant agrees with an assigned role but decides not to take up the role for any reason. Then the human focal actor can intervene.

4. Mobilization: At this stage, the various spokespersons elected by the member of the network emerge. As mentioned earlier, it could be a product, an act, a delegation, a way of life, etc. The focal human actant has no role here. But other human actants that are part of the network have a role here.

This translation process will be evident in the advancement of Industry 4.0 (advanced manufacturing), the development of self-driving cars, automated homes, and other areas where technology exhibits soft power. Hence the 4 moments of translation is bound to be valid for a while.

But as mentioned in the previous section, a point is coming when technology will create itself and the needed OPP. There will be no human intervention. A perceivable example can be found by looking back into middle of the information age. If you needed a website, you would pay a professional that will develop it for you. Now today you pay a platform owner, he/she grants you access to the platform’s web designing platform. All you do is drag and drop and few minutes you have a website. You upload your content and go to bed and the system works for you. That is what we can perceive now. But as will be discussed, at some point technology will exhibit full power and humans will have to be permitted by the technology to either join or remain in the network. The ICT technology likely then to play a similar central role as ICTs today is Artificial Intelligence (AI), to be specific Artificial Super Intelligence. They will be the brains behind machines and robots. This is easy to predict because western governments and different industries have
been interested in AI (Williams, E-Government, Yesterday, Today and in the Future, 2020).

Before discussing the potential implication of Artificial Super Intelligence led actor networks on the 4 moments of translation, let’s take a very brief overview of AI. There are 4 types of AI. These are reactive machines, limited memory, theory of mind, and self-awareness (Senthilkumar 2020; Gollapudi 2019).

1. Reactive AI: They are common today. They are programmed with neither stored memory nor to use past experience (ibid.). Siri, Google’s Alpha Go, and IBM’s deep blue are examples of such AIs. They are also used in manufacturing plants. They are reliable because they are repetitive but they do not engage.

2. Limited memory AI: As the name implies they hold limited memory (ibid.). They can interact but by fetching the relevant answer from what they have stored. In instances where they lack information, they are limited. However, in order to create space for more information, the stored information lasts for a short period. This type of AI is being implemented in self-driving cars.

3. The theory of mind AI: It does not exist yet, but it will exist in future. This AI will be emotionally intelligent; will be able to understand the psychology of humans and Interact with humans (ibid.). Such AI will be able to become a part of human society as well as learn from humans in order to be able to interact with humans.

4. Self-aware AIs are those that possess their own independent consciousness (ibid.).

These types of AI are categorized into three. Artificial Narrow Intelligence (Reactive machines). The term narrow is used because they can perform narrowly defined tasks (Kaplan and Haenlein 2019). The next stage is Artificial General Intelligence (limited memory AI). The term general is used because they can think and make decisions (ibid.). The final stage is Artificial Super Intelligence (ibid.). They are humanized AI (theory of Mind and the Self Aware AI). This is when the capacity of AI surpasses that of humans.
In other words, we can say that the future is sci-fi made real. Anyway, that was a digression. But by analyzing the 4 types of AI, it is evident that in the future technology will grant agency to men. Currently reactive AI and limited memory AI are here and exhibiting soft power granted by human. For example, voice recognition commands are needed to open doors, control home lighting systems, smart homes, etc. But when the theory of mind and self-awareness AIs are in charge of earthly actor networks, will the observable 4 levels of translation in Callon (1986) work still be valid? That is difficult to predict but also highly doubtful. We have to look at it in two ways. In instances that involve machine-to-machine activity, the 4 moments of translation will not exist. That will just be a master-slave relationship. They will just function as programmed. However, for machine-to-human activity there is the probability of enrolment and mobilization. Problematization might be scaled down to just an OPP and identifying the actants needed. However, this is very uncertain.

Conclusion

As the title of this chapter indicates, the robots are here. They are here because their status has been elevated in the various actor networks where they operate to that of focal actancts. Technologies have earned the trust of humans over the ages. They have been reliable in advancing human civilization. Today in the midst of the COVID-19 pandemic, technology has saved economies from total collapse. All activities such as conferences, meeting, remote working, ecommerce, and even ordering from restaurants all take place on the Internet. Aside that software companies are developing applications that can track your COVID-19 status. Aside the pandemic, technologies via mobile apps support our wellbeing. There are apps that aid our workout routine, eating habits, and even how we cook. Hence, as a result of that trust, we humans are granting more powers and autonomy to technology.

However as seen in this chapter, the gradual emergence of technology as the focal actant in different actor networks such as commerce, the environment, our home and industries, etc., has an implication on the 4
moments of translation and potentially on the Sociology of translation as a whole. So far, there are signs that the 4 moments of translation will still be observable in different technology driven translation processes in the near future. But after that no one is certain. Despite this mixed conclusion, there is the need to study sociology of translation as a whole with power relationships in mind. This will enable the research to move to human-centric translation to technology-centric translations. Just as the title of the chapter reads “the Robots are here,” we should acknowledge it in research and grant them the place due them in the sociology of translation.

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