

# Research paper on problem identified

[Technology](#), [Development](#)



## **Introduction and description of the problem**

We shall embark on a proposal that would augment a solution to an identified challenge. An exoskeleton is simply defined as a device that enhances the execution of an action of its wearer. Not being able to walk really deprives a person of the comfort of movement and the opportunities with which it brings.

The global statistics on people with disabilities are staggering at best. At present, over 10% of the global population live with one or more forms of disabilities. The increase in life span and the number of elderly individuals is also worrisome. In the United States alone, over 19.4 million people experience problems climbing stairs and walking. The number of soldiers returning from war with injured limbs is increasing. The incidence rate of congenital upper limb deficiency in the United States is approximately 4.1 for every 10000 live births. Disabilities of the limbs immobilize individuals denying them of quality life. This problem is bound to increase due to increased accidents and vascular diseases. It is therefore of importance to enhance the life of people with disabilities of their limbs. In recent times, the applications of robotic machines have been widely deployed to enhance treatment and help patients suffering from various ailments. Application of exoskeleton has proved to be not only helpful but it has opened a new scope of technological development(Lin et al, 249).

Previous attempts to help people with walking disabilities such as provisions of wheelchair has somehow helped but to an extent. When a person succumbs to stroke, his/her ability to move is hindered with. This results to

a person being confined to a wheelchair. This is a lifetime sentence depending on the action taken after such a case happens. Since not everyone has the financial ability to pursue further medication, some just end being confined in wheelchairs. I will embark on a study that can provide a reasonable solution. In this exoskeleton can find a proper application, as would be seen throughout the proposal. The military can also adapt these measures in curbing its challenges in the various fields of combat. Basically the life of a person whose legs are not useful would require further help apart from a wheelchair. Giving them the test moving a leg step by step feels like. Further various applications of exoskeleton enabling or enhancing certain actions to be done is also achieved. Exoskeleton robots not only offer the victims a second chance at life but also give them a quality life.

### **Solutions to the Identified problem.**

Victims with disabilities may not have the control of all their appendages. As such, exoskeletons can be used in order to enhance their mobility. More precisely, exoskeleton robot can be used to rehabilitate the patients. For instance, patients with stroke may not be able to move around depending on the extent of the stroke. The medical field can make use of exoskeleton robots in order to improve the quality of life that these patients lead. There are three models deployed in this kind of enhancement. We can have a therapist guiding the patient stepwise. This is materialized by the push of buttons. Secondly the patient may choose to personally be the in charge of prompting the steps by the same mode of button pushing. Lastly, the patient being the user in control, accomplishes this step by advancing their hips

forward and at the same time displacing them (Eskos Bionics, Choices of 3 Walks Modes, eskosbionics.com).

The military undertakes research in order to design exoskeleton robots that can be used by the soldiers for different functions. Soldiers carry heavy combat equipment while on duty. The military uses exoskeleton robots in order to enable them carry the heavy weights and still be efficient. Besides this, many soldiers get life altering injuries while in combat. Some of these injuries inhibit their appendages and hence cannot move around. The use of exoskeleton robots in this case helps the injured soldiers lead a life as close to normal and quality as possible. The exoskeleton would also provide an armour capable of protecting the soldier from bullet shots and even strangely bomb attacks. This is a preemptive move to prevent injuries that might lead to disabilities. The development brought new ideas of a full bodied exoskeleton rather than the one which would only at the limbs to help in performance effectiveness.

In depth study provides an elaborate explanation of two assorted kinds of exercise carried out by manipulating robots. The two accounts are wearable exoskeletal or rather robotic orthosis and stationary robots. Much insight was given to the main type in regard to my study. Exoskeleton also provides another two coincidental related use . They are exercise devices and the other type is powered braces. They tend to work in less assorted conditions as compared to stationary robots Robotic walkers also provide ambient help to the users . Both in therapy and operative or rather functional aid are under proper overview pertaining their development(Stein 313-314).

## **Justification of solutions**

Such immense developmental leaps have been made able by organizations such as Esko Bionics based in the U. S. in the state of California. They basically come up with a device or exoskeleton that allows people in wheelchairs to stand and be mobile. Thus it basically enhances humans movability and the capacity to perform an action. Japan has also been a force to reckon with when it comes to Robot assembling and deploying especially in the health Sector. Clear illustrations and understanding of the technology in use shows that technological development has also been deployed in manufacturing and as well as in its level of operation.

Challenges endured by such industries are outlined in order to give the next step in development. Problems involving power supply, efficiency and designing of the exoskeleton depending on the special needs of the users are met. Hence it is possible to note that upcoming modified inventions of an exoskeleton device in the field of medicine. For such developments to materialize, ethical and legal factors need to be taken care of since the presence of our broad cultural differences. An outline is also given to identifying various types of robots applied in the medical field all depending on the particular part of the world it is situated. With each specified robot contributes to the augmentation of the patient requiring the device for mobility or to facilitate an activity or action to be carried out (Kusuda , 35-37)

When it comes to the weight management, such exoskeleton device will be made in a way that , all the weight is shifted to the ground. This makes the wearer or rather the person using the device not to have any feelings of the

mass being carried or lifted up ( Matthew Gannon, Exoskeleton allows paraplegics to walk, CNN. com). This may be applied by the military to enable its soldiers to be carried heavier loads and still be efficient in battles. Basically such exoskeleton devices give hope to a person in a wheelchair. Hope to live or encounter with life on a much greater scale. Enabling them to simply walk or just move the lower limbs with the help of the devices, gives them a rare opportunity to be mobile and perform certain activities in places they reside. Enabling them to stand is and can be counted as a remarkable thing . The user can therefore perform various actions that do require him/her to be in an upright position.

The motion of the mobility enhancement skeletons is facilitated by the presence of motors. Taking the case of a device used by a stroke patient , ends up being made of four motors in each of the joints. That is, two located on the upper part of the limb, hip and the other at the knee. They act as its power source together with batteries connected together . A computer wounded to sensors which plays the role a brain ( Matthew Gannon, Exoskeleton allows paraplegics to walk, CNN. com).

Apart from the use of an exoskeleton, other viable types of robotic mechanism have been built to amplify the health care system. Some include ORS Image Trac Video System, which is mainly adopted by surgeons in performing certain operations. Other companies that remarkably important in the medical field by developing such robots are Olympus Optical Co. LTD and Hitachi Ltd (Kusuda 35-37). Greater therapeutic consistency is also observed in deploying exoskeleton robots . This device also brings out virtual reality in handling or performing tasks such as a limb movement

enhancement. An immediate possible feedback is also experienced when users deploy these devices.

It was prudent to point out the kind of challenges robot-producing industries face in developing exoskeleton which is to be applied in the medical sector. The development and enhancement of these devices have brought a new scope of what life may actually be if you can actually walk and stand . This is the kind of implication depicted by the person or users that uses exoskeleton . Also various robotic mechanical devices hare deployed in the various sections in the field of medicine. As far as robotic rehabilitation is concerned, stroke patients have often found another way to deal with the predicaments which they face such as wheelchair confinement . By this a more detailed explanation in the medical field. It also gives the relationship between the different body muscles involved in the exercises and the various features of the robots. The author also provides information concerning the technical and technological aspects of the robots. The sources of information used by the author are credible.

Conclusion

## **Works Cited**

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