



GE 401 – INNOVATIVE PRODUCT DESIGN AND DEVELOPMENT I

LITERATURE SURVEY AND COMPETITION REPORT

TEAM 6



Taha Alper Yoğurt	20700265	EE	(innowi@innowi.com)
Niyazi Koray Ertan	20702218	EE	(kertan@innowi.com)
Berkay Akyapı	20800955	EE	(bakyapi@innowi.com)
Mehmet Mithat Çınar	20802687	IE	(mmcinar@innowi.com)
Hazar Orhon	20801784	IE	(horhon@innowi.com)

METHODS FOR ACHIEVEMENT

innoWi proposes a barely new and challenging product to produce. Therefore, at first glance there cannot be advised an exact way to manage the production. Meanwhile there is at least a roadmap to follow which leads innoWi to accomplishment. If this roadmap is examined step by step, it can be explained as:

- I. **Research:** It can be accepted as the beginning of the Research & Development stage. A detailed web based research is important to have the first steps and make a concrete start. At the same time, this research gives the opportunity to meet the competitors and the pre knowledge on the market and industry.
- II. **Consultation:** A consultation which is done with the experts on such technologies is fruitful and helpful to determine a path.
- III. **Design:** According to results of the research and consultation steps, getting prepared with a SPICE design. This is where the engineering point of view is getting inside of the project.
- IV. **Design Improvement:** By the help of SPICE design, necessary improvements on the design are to be made. In this step, goal of innoWi is to have a stable design of the product. However, if necessary, some changes on the design can be done in further steps.
- V. **Experiments:** After being sure of having a strong design, first real life experiments are done, starting from the very basic level. During the experiments, weak and strong sides of the product can be examined in a healthier way. Extra work on the design and product can be done during this step.
- VI. **Prototype:** The real life design of the product is ready and a working prototype is prepared. Prototype is the proof of the working mechanism of the product. It also adds credibility to the project and innoWi.
- VII. **Finalization:** In this very last step, after having the prototype, the final version of the product is created and it is ready to sell.

UNDERLYING TECHNOLOGIES OF THE PRODUCT

As an introduction, it can be said that the basic and actually the most important technology to be used is induction. Magnetism and induction is a very well known technology for plenty of years and a bunch of studies were done on this subject before. However aim of innoWi is improving this technology and introducing it to the mobile phone industry. In fact, there are some trials about the use of this technology in mobile phone industry, but they are unsatisfactory or non-finished. Furthermore, there are a few of products which are already in the market and being sold, but after a short investigation it is easily seen that they have some common problems on the issue of efficiency, cost and compatibility.

POSSIBLE APPLICATIONS OF THE PRODUCT

In order to explain the possible applications of the product, a brief description of the product should be given. Designated product is a “wireless mobile phone charger”. It will have a box shaped design. Dimensions of the product are not certain yet but it is planned to be as big as 5cm x 10 cm x 5 cm. It is planned to work on with a strong battery on it without needing a direct power coming to device. Also, there will be a team of adaptor connected to power outlet which can directly be used while the charging session or charge the box when it is idle. Box will not continue working or turn into idle mode when there is no mobile phone inside of it, to avoid the energy loss. Moreover, it will have an ultraviolet emitter installed in order to disinfect the mobile phone and device itself. In order to charge the device the mobile phone users will carry his/her own receiver which can be carried in a wallet or even installed into the cover of mobile phone. In further steps, the devices may have these adapters pre-installed. Price of the product cannot be estimated now, but at least it can be said that it would not be more expensive than the potential competitors of it.

There are two types of uses of the wireless mobile phone charger: Commercial and Non-Commercial Use.

I. COMMERCIAL USE

This application of the product is designed for public areas like airports, shopping malls and conference centers. A charging station can be imagined in such a use. In the station, several boxes are ready to charge and each of them has its own lock. As known from daily life experiences, it is not easy to carry mobile phone chargers with. Even if you carry all the charging components with you, in such places; it is extremely hard to find a power outlet to charge your mobile phone. If so, what would you do if you are out of battery and you need to give a call or send a text message? In such a situation, innoWi wireless charger would be extremely helpful. Without needing the specific charging unit or the adaptor and the power outlet, it is very easy to charge the mobile phone. The box will have a design like a safe, which will allow user to continue his work or shopping when he leaves your mobile phone into charging unit.

II. NON-COMMERCIAL USE

This application of the product is designed for car and home usage. Additionally, it can be used in cafes and restaurants as an extra service. Non-commercial version of the product will be a single unit device which can be used with its built-in rechargeable battery. It gives mobility to the user in the place that is used.

EXISTING COMPETITION ON THE WORLD

Since wireless charging is rather new technology, there is not a very cutthroat competition. There are several products that pledge wireless charging; however these products are not at satisfactory level. In fact they work with the same logic and technology. The problems with those devices are: possible harms on your mobile phone, dependency to power outlet, the dependency that you put the phone on the exactly indicated point on the device. On the other hand, there are some applications for patents and academic studies. These academic studies are truly very promising but, they do not seem to enter this competition in very near future.

POSSIBLE COMPETITION AT THE TIME OF THE PRODUCT

Possibly the actual situation will continue with some new comers to the market. Our product will be compared to regular charging pads, however with its additional features and technology, our product will be one step ahead. At our expected time of our production it is not forecasted that a revolutionary product enters to the market. As a result, our product will make a difference among its rivals.

For commercial version of our product, less competition is foreseen. There is some charging devices which can be found in some shopping malls; however there are sockets for user to charge his mobile phone. They cannot offer wide range of sockets for different mobile phones. Moreover, they cannot offer a safe for your mobile phone, so user needs to wait until his mobile phone is charged.

COMPETITION FROM SIMILAR PRODUCTS

innoWi have two main competitors. One of the competitors is traditional cable chargers which are connected to power outlet. These products are almost used by all mobile phone users. Also after innoWi enter to market, these traditional chargers will be market leader in charging by far. However, it is believed that innoWi can reach a wide-range of costumers which are normally using cable chargers.

The other main competitors will be the other wireless charging devices. These devices are sold as charging pads in the market. As explained above, these devices are using same technology in a different way and have some restrictions than our product.

To be clearer it is useful to make comparison between innoWi wireless charging box and the possible competitors of innoWi in the market.

First it would be suitable to examine the competitor product and make a comparison.

1.

Product Name: Powermat 2X Portable Mat & Power Cube [1]

Producer: Powermat

Basic Features of the Product:



- I. It charges mobile phones from near field
- II. Dimensions are: 3.25" x 9.25" x 1"
- III. Product weight is: 2.0000 lbs.
- IV. Its battery is powerful
- V. Special receiver case is necessary for charging

Price of the Product: \$129.99

Comparison:

- I. In this product if the mobile phone is not in the exact right position on the mat, fully efficient charging does not occur. In our product, it is aimed to charge the mobile phone inside of the box wherever it is put with full efficiency.
- II. Since it is not a closed shaped product, magnetic field created by the charger is dissolved around the product and can create incompatibilities with the devices working near side of it. For example, credit cards are In danger near to this product. In our product, box has an enclosed structure, and it does not allow creating a magnetic field out of the box.
- III. This product is not applicable for the commercial use. User cannot leave his phone on the charging mat and go out of sight comfortably. On the other hand our product gives the advantage of using a safe which contains the device and protects it at the same time from outside harm.
- IV. In this very product, there is no work on disinfection. In our product, ultraviolet emitter cleans the phone from bacteria.
- V. This power mat is not applicable with all phones. For instance, since Blackberry Bold phones have charging points on corners, this power mat does not have the ability to charge it.
- VI. This power mat cannot be used in the cars, as specified in the Product FAQs. However it is not foreseen any problem on using our product in cars.

2.

Product Name: GETPOWERPAD 3 charge pad [2]

Producer: GETPOWERPAD



Basic Features of the Product:

- I. It charges the mobile phone from near field
- II. Dimensions are: 28.1 cm x 15 cm x 1.5 cm
- III. Product weight is: 1.0000 lbs.
- IV. Special receiver case is necessary for charging

Price of the Product: €79.00

Comparison:

- I. Position of the phone on this charging pad is important. If the phone is not in right position charging does not start.
- II. The same problem seen in power mat is faced again. The magnetic field created by the charging pad can be harmful for the other devices, such as credit cards. Also it can be a threat for the human life.
- III. This product is also not applicable for the commercial use because of the same safety concerns.
- IV. Again disinfection property is not provided in this product.

As easily understood, the first 4 elements of the comparison are the same or similar with the comparison between Powermat and our product.

- V. As a last element of comparison, in this charging pad, power supply is not a strong one, which rises the problem of charging the charger pad frequently. This limits the user friendliness and easiness of the usage.

3.

Product Name: Energizer Qi - Enabled 3 Position Inductive Charger [3]

Producer: Energizer



Basic Features of the Product:

- I. It charges the mobile phone from near field
- II. Dimensions are: not given
- III. Product weight is: 1.0000 lbs.
- IV. Special receiver case is necessary for charging
- V. Charges I-Phones and Blackberry Phones

Price of the Product: €89.00

Comparison:

Since this is also not a box shaped charger first 4 elements of the comparison are the same.

As an additional comparison, it can be examined that, this product is only compatible with I-Phones and Blackberry Phones. The other mobile phones cannot be charged by using this wireless charger. But in our product it is designed to charge every different brand and model.

4.

Product Name: PowerKiss Heart [4]

Producer: Zens



Basic Features of the Product:

- I. This product is put into or under furniture
- II. Dimensions are: not given
- III. Product weight is: not given
- IV. A receiver is not necessary for the wireless charging

Price of the Product: €99.95

Comparison:

- I. To use this product, user either has to conduct an operation on his furniture or stick it to under the furniture. This operation just damages the nature of the furniture and may not be very preferred.
- II. This product is not getting benefit of near field method. If the material between charger and the phone is metal, it can create some problems on magnetic field created by the charger and charging could be stuck between limits.
- III. Portability and mobility of the product is very restricted. In many cases, actually in every case it is not practical to move the furniture around the place that is used. It does not need any cables; however it is more limited on accessibility and mobility issues than the classical charging adapters.
- IV. Since the most common use of this product in or under the tables, used furniture should be in harmony with the charger. If the table is made of glass or some other material similar to glass, this product would be disturbing for the user.
- V. This product needs to detect the place of the mobile phone. It creates time consuming and inefficiency in the charging period.
- VI. Comparably, this product is very expensive.

CONCLUSION

As a conclusion it can be said that innoWi wireless charging box is produced by following a certain path. It is detailed and every detail is handled beforehand. Since there are some similar products in the market, possible risks can be handled beforehand by an investigation on these products. Also, our product is being different from the others in certain areas like safety, efficiency, compatibility and health caring.

With enough and careful work on it, it has the potential to surpass the other similar products in the market and force the place of the classical charging devices.

REFERENCES

- [1] <http://www.powermat.com/mats/powermat-2x-portable-and-powercube.html>
- [2] <http://www.wirelesscharger.org/charge-pads/getpowerpad-3-charge-pad.html>
- [3] <http://www.wirelesscharger.org/charge-pads/energizer-qi-enabled-3-position-inductive-charger.html>
- [4] <http://www.wirelesscharger.org/charge-pads/powerkiss-heart.html>

