# The "Fixit" Economy: What does it mean for project & product professionals? [1]

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## Abstract

Recycling or has been in vogue for the last two or three decades to save the environment and various organizations, communities and countries have embraced it as a priority. But, what is being done as 'recycling'? Are there efforts to do Repairs / Refurbish or Reuse / Repurpose before the materials are finally disposed as trash or sent to the landfill? Increasing quantities of waste in the landfill create environmental and health hazards apart from posing a challenge of managing its disposal.

The 'Fix it' process is nothing new. This is how we started off during the industrial revolution, but over time, "use and throw" became the norm. Now, we have acute problems with environment and resource utilization, and focus on repairs and maintenance can be a very useful step in the circular economy chain.

In the coming years, the 'Fix it' economy can be become substantially large, considering that many of the advanced countries did not give it the needed priority and moved to a product development strategy focusing on quicker obsolescence and near monopolistic facilities for repair or replacement. The developing nations continued with the repair and maintenance processes more easily because of their lack of affordability, purchasing power for high-cost products, and, to some extent, their culture and way of life.

Activities involving Repairing / Refurbishing and Reusing / Re-purposing are all examples of projects. Timeline, risk or uncertainty of success and scoping are variable in individual cases and become candidates where project management can be gainfully deployed. There is also a need to incorporate a mindset of Preparing or Designing to 'Fixit' at the stage of product development itself. This activity would be a 'project' and product management will be required to consider the marketing and economic aspects.

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# All about the 'Fix it' Economy

## As part of a Circular Economy

### *What is a Circular Economy?*

Traditionally, as manufacturers and consumers, we have been practising the method of *take - make - use- waste* with the final step of sending materials to the landfill. This is an example of a linear economy. Over the years, this has included recycling, in which some portion returns to the manufacturing cycle. However, certain materials still end up in the trash. A further development is the concept of 'zero waste', where nothing goes to the landfill and all materials beyond consumption are returned to the operational cycle. This is achieved through *repair, reuse,* or by *refurbishing/re-manufacturing*. This is an example of a circular economy.

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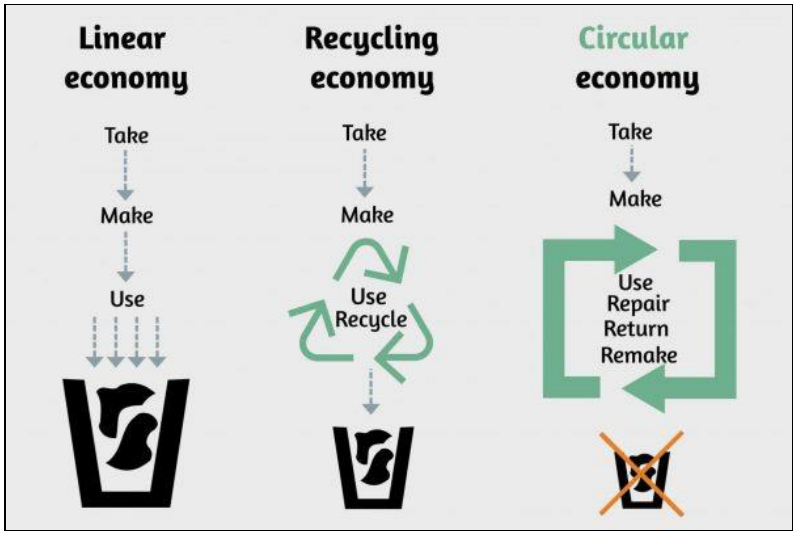



Exhibit 1: Circular Economy

### *Why do we need a circular economy?*

The question of moving to a circular economy from linear has come-up due to the large-scale environmental problems coupled with degradation of resources. Moving to a circular economy is beneficial though the transition will not be easy, and it could take a long time. This shift will tackle the problems of climate change, pollution and biodiversity, It is an opportunity for organizations to cut costs and improve profitability and make them more competitive. Following it will help separate economic growth from the need to use substantial resources and can be an avenue for new jobs because of innovation and new projects/products that will be developed in the next decade.

*'Fixit' and Circular Economy*

At various points in the circular cycle, i.e. from sourcing, transportation, manufacturing, distribution, consumption and beyond, there is an opportunity for materials to be returned back to the system.

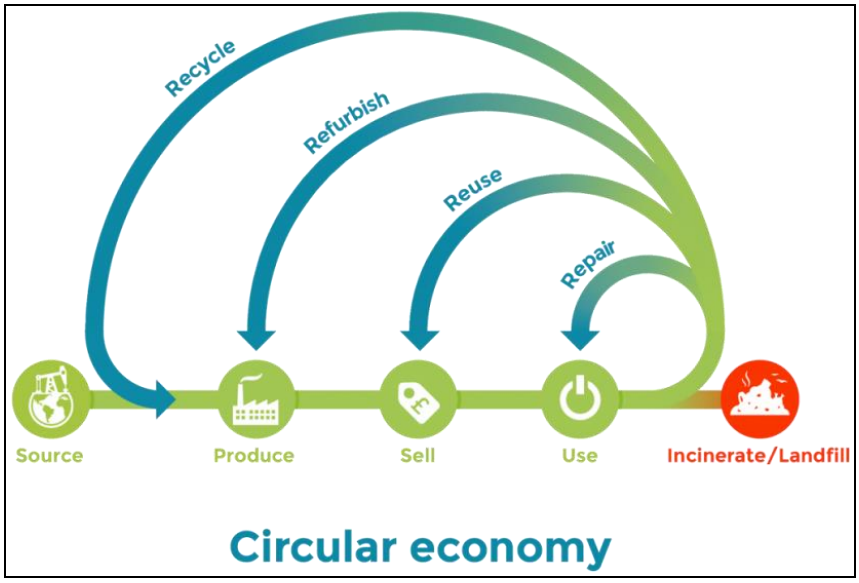



Exhibit 2: Returning materials to the system

From the viewpoint of productivity, the preferred option will be to take action at the earliest stage of the return cycle. This would be Repair (done at the point of use) followed by reuse, refurbish and if these are not possible recycle.

***Customer oriented service and sustainability goals.***

Organizations focus on customer satisfaction as part of their product & service delivery. This is normal and a well-accepted practice. But if one views it from a sustainability angle we have to include the environmental and social effects.

A part of this is the return cycle (which includes repair as an option) where efforts are made to return the product or materials back into the system.

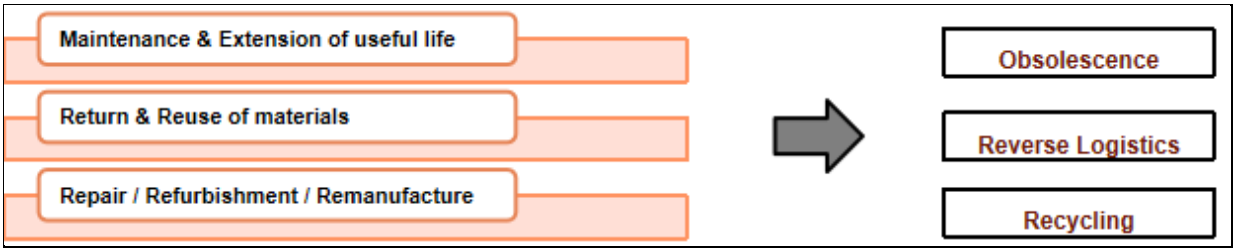



Exhibit 3: Methods for return products or materials

In order to change from a linear to a circular supply chain, three methods can be identified.

✧ **Maintenance & Extension of the life of a product**

Frequent change and introduction of revised models and upgrades, which has been the practice over the last few decades. This is unfortunate, as it has led to excess consumption and more wastage. It is directly connected to the phenomenon of obsolescence, where products are made artificially obsolete through 'planned obsolescence'. In industry, a large part of the malaise of wastage and resultant negative effects on the environment and resources is because of quick turnover in products when newer models and upgrades are introduced. This is easily visible for e.g.in the electronics and automobile industry.

✧ **Return & reuse of materials**

Materials and components, when unusable, after use or are to be repaired, can be sent back to the manufacturer. This can be re-used as part of a new product after refurbishment or added in some proportion to the original. This would reduce the cost of manufacture. Forward logistics has been in practice for quite some years and is a well-established supply chain model, e.g. amazon. The same has to be replicated for reverse logistics as well. While it is in place for some organizations up to the point of supply, it has to be extended beyond to the end of the life of the product.

✧ **Repair, Refurbishment/Re-manufacture**

This considers a situation after the delivery of the product and when it is in use until the end of its life. Often, the problem with a product can be sorted out by repairing it at the customer's site itself. This is the most preferred option and, if required to be pursued, adequate manuals have to provide for DIY (Do-it-yourself) mode or additional technical support provided. If repair is not possible, then the product has to be sent to the manufacturer for refurbishment or re-manufacture. Such a process is required if we have to consider a supply chain or cycle which will be circular rather than a linear one, as the latter will limit it to services only up to the point of supply.

**Repairability**

***Repairability Index and Scoring***

Repairability is an important step in the solution to improve the circularity of manufacturing a product. Ironically, this is a case of going back to practices which were done earlier, which now in the name of progress has been relegated to the back burner. Fortunately, many of the developing countries, unlike the advanced economies, still practice 'repairing' instead of 'use and throw'.

Some organizations have developed a repairability index which provides number scores for various products on the ease of repairing. e.g. https://ifixit.com. It gives a score of 10 for Fairphone, a European manufacturer, 7 for iPhone 14 and 6 for google pixel 6. Such scores are available for other phones and electronic products like tablets and laptops.

Some countries, like France, have been at the forefront of establishing a scoring system.

Other bodies which have similar models may arrive at different outcomes, e.g. US based www.pirg.org, a public interest group.

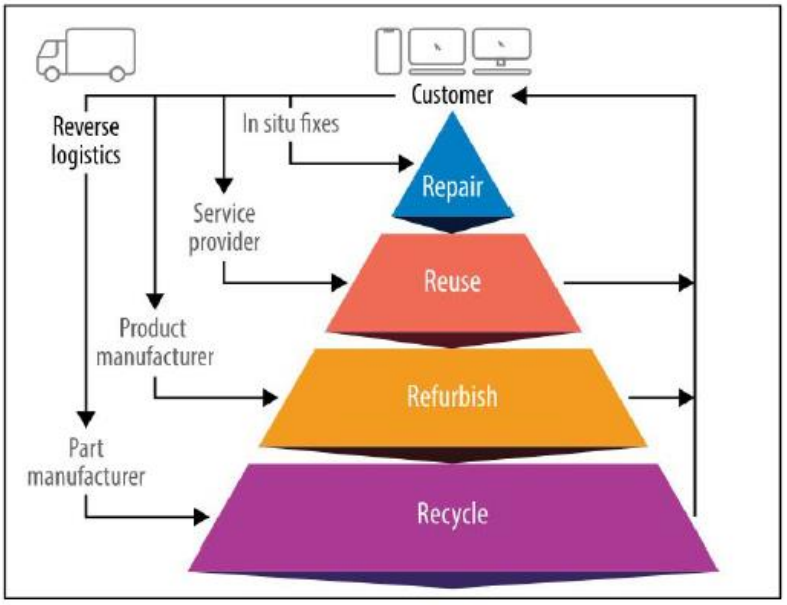



Exhibit 4: Reverse Logistics and Productivity in Circular Supply Chain

### *Repairability & Sustainability*

Repairability has to be seen in overall sustainability, particularly considering the stage of recycling. It becomes an option only when the other avenues of repair, reuse and refurbish/re-manufacture are exhausted, though historically, during the last many decades, recycling has been resorted to most of the time. This will not be an optimal solution because we do not know if the products upon recycling are put to good use or sent to the landfill. The preferred method will be to Repair at the customer's site and if this is not possible, then it will be reused by others as a whole or its parts failing which it will refurbished /re-manufactured to make it function like the original product. This method when practiced by organizations has to be adequately supported by product warranties.

### *Repairability and Strategic considerations*

To build in Repairability, we have to look at strategic considerations.

Technical: Design to make it easy to dis-assemble, repair and assemble. Leveraging technology for repair-related information delivery. The availability of parts and personnel is important for accessibility.

Economical: Unrestricted repair authorization for partners. | Availability of parts, information to avoid a monopoly.

Environmental: Focus on environmental impact to reduce waste of natural resources. | Increase in product life span.

Regulatory: Protection of intellectual property rights. Avoiding the use of warranty clauses to restrict alternative routes.

Social: Peers striving to evolve and improve the ecosystem through competition. Assistance for small repair shops and job growth

| Company | Number of devices scored | Average of French scores | Average disassembly rating (out of 10) | Did we find a record of direct lobbying on Right to Repair? | Is the company a TechNet member? | Is the Company a CTA member? | Anti-repair lobbying deduction | Grade out of 10 | Letter grade |
|---|---|---|---|---|---|---|---|---|---|
| Apple | 20 | 5.64 | 2.86 | Yes | Yes | Yes | 1.5 | 2.75 | F |
| Google | 3 | 6.33 | 5.94 | Yes | Yes | Yes | 1.5 | 4.64 | D+ |
| Motorola | 18 | 7.15 | 8.38 | No | No | No | 0 | 7.77 | B+ |
| Samsung | 21 | 8.10 | 3.78 | No | No | Yes | 0.25 | 5.69 | C |

Exhibit 5: Example of Repairability Index scoring: US pirg

## Present Status & Trends

### *E-Waste*

In case of electronic waste, only approximately 20% is being returned to the system as part of the repair, refurbish / re-manufacture stream. The rest, approximately 80% goes to the landfill. This is not only a health hazard because of the vapour that it generates during incineration, but also a source of material wastage as many minerals of value are part of the waste. These include cadmium, mercury, iron, copper, gold and fluorocarbons. The landfill for electronic waste is concentrated in Africa (Congo, Kenya, etc.) and Asia (India, Bangladesh, etc.). The quantum of electronic waste produced is substantial, the annual global figure being in the range of 50 million tonnes having a value above US $50 billion.

Considering the quantum of electronic waste and the value, there is considerable scope for projects in this space. Organized industry with their financial and technical resources can contribute and gain from it, and therefore, it is a good opportunity.

### *'Right-to-Repair' movement*

The Right-to-Repair movement is trying to find solutions to this problem through legislation works largely through not for profit or public interest groups. Governments are also active here e.g. many European countries including France, the US, Australia, India, etc. with partial progress in each, with many of them on the way for the laws to be passed. Most of them mandate the availability of manuals for repair, non-exclusivity in repair vendors and making parts available freely.

### *Community Organizations*

Other ways in which the Repair movement is active is by establishing internet cafes many of them as 'pop-up' or ad hoc, forming groups of like-minded bodies e.g. the open repair alliance which includes five organizations: antifungal, fixit clinic, ifixit, restart and repair cafe.

The Library of Things or Tool Library are interesting ways where sharing is used as a solution to prevent disposal and instead make use of products, thereby increasing their life span.

## Interface with Project & Product Management

### Projects in the 'Fix It' Economy in the Technical Cycle

To identify projects in the 'Fix It' Economy, we can broadly consider two groups - Biological and Technical cycles. In the former, products after use and disposal are returned to the system and there is no problem in assimilating them. No untoward effects are produced from viewpoint of environment, hazards or resources though one could look at more effective production processes here. In the latter, i.e. the technical cycle, products at the end of use and disposal need to be specially processed and do not assimilate with the natural cycle as they are not biodegradable. This paper is focusing particularly on the products in the technical cycle because for a 'Fixit' economy the products and processes would be part of this space rather than the biological cycle.

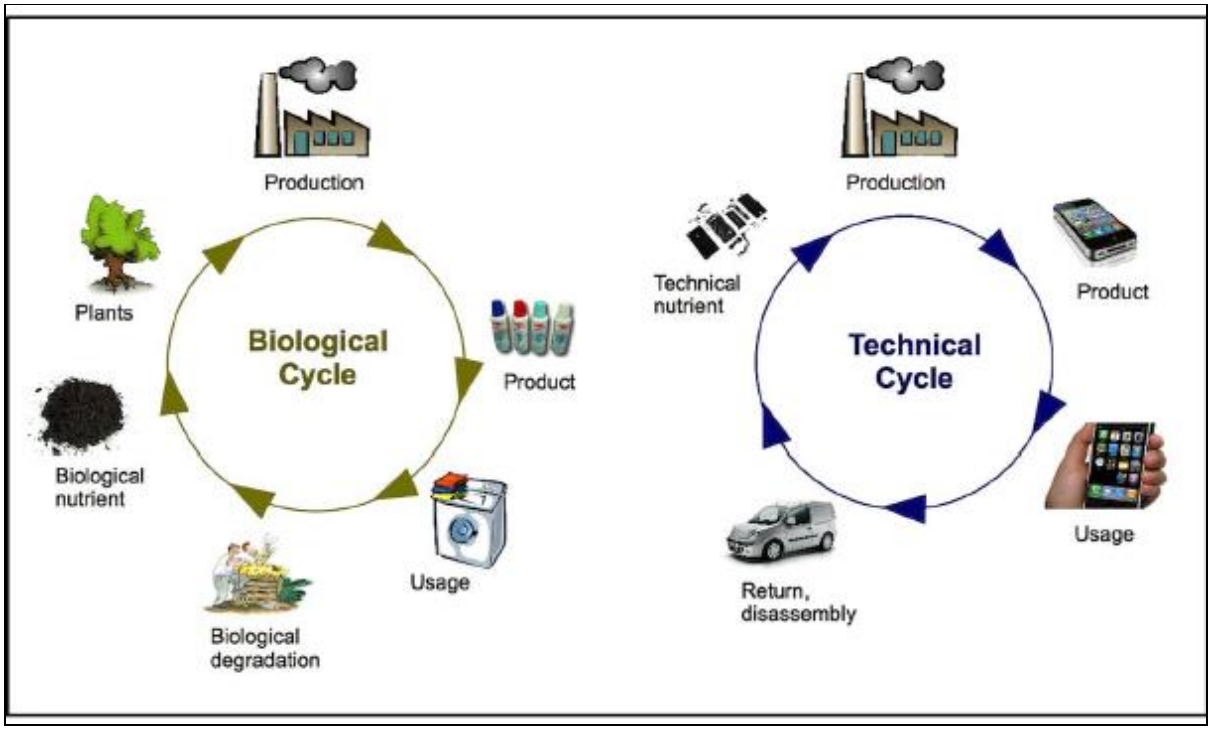



Exhibit 6: Biological & Technical Cycles

Also excluded from this list are projects under MRO (Maintenance, Repair and Operations) as they are business-as-usual initiatives and would be considered as operations. Other areas which are not covered here are re-manufacture particularly automobiles, construction and plant & machinery. This is so because in this area, products after use and disposal are being processed most of the time, and do not have a significant effect on the environment or resources.

The focus is more on electronics and allied products and industries as they are currently the areas which need attention from a 'fixit' perspective.

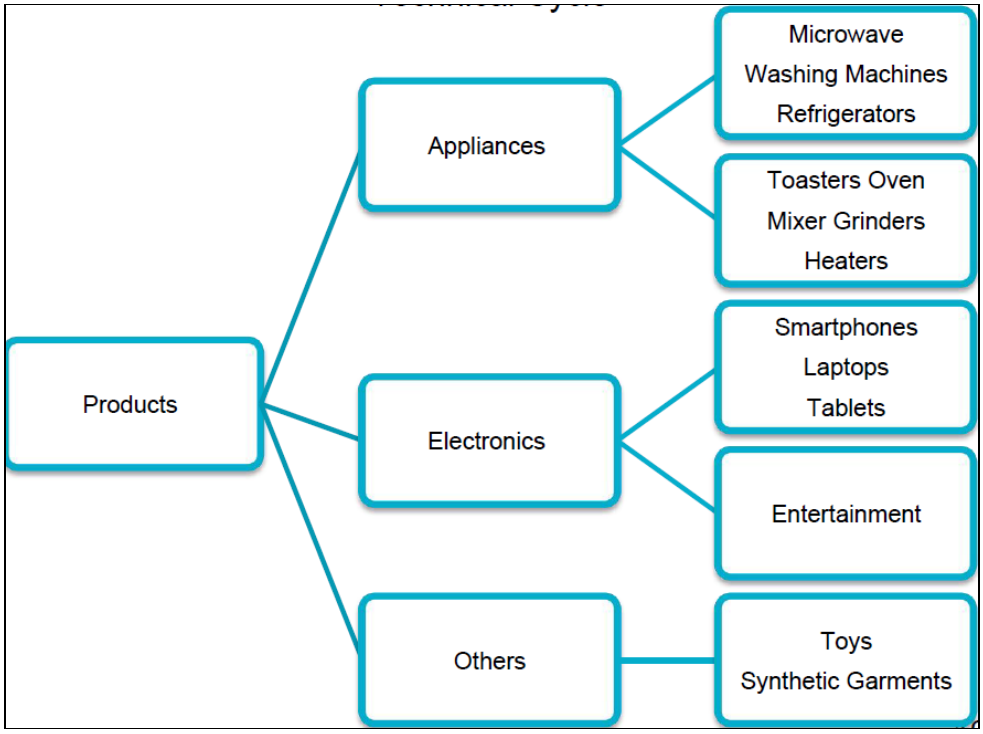



Exhibit 7: 'Fix It' Projects in Electronics & Appliances

To the above list of projects, we can add two groups which would qualify as 'projects'.

**Design for Repairability**: Historically, over the last numerous decades and before, products were being developed and produced without considerations of sustainability and instead, the focus was on profitability and customer satisfaction. This is now changing, as there is a need to include a perspective of repairability when developing a product. This means 'Design for Repairability' will be a project for existing products at least till such time or cases when it becomes the norm to have a repairability perspective incorporated while developing products.

**DIY**: or Do-It-Yourself can be a good option for repairing projects at the customer's premises. Developing & manufacturing organizations have to make this possible by supporting their products through DIY manuals, videos and training, apart from making it an integral part of the product delivery in the use and disposal cycle.

**Life Cycles, Project & Product Management**

The overall circular life cycle includes the 'Fixit' life span, which encompasses repair, reuse, refurbish/re-manufacture, recycle, and reverse logistics stages. Since we are

discussing products here, as project & product managers, we are traditionally used to considering the life cycle up to the point of delivery, or cradle to gate. The circular cycle for products has stages of cradle to gate/grave and back to cradle or cradle to cradle. Now, keeping the reverse cycles in mind, we have to focus on gate to grave/cradle. Refer Exhibit 8


Exhibit 8: Cradle to Cradle

**PMI Standards**

It is useful to understand the ways project and product management standards approach the initiatives as part of the reverse cycles in the circular value chain. For e.g. in the PMBOK 7th Ed Standard of PMI, two principles stand out, i.e. Value and Tailoring and the project performance domains of Uncertainty, Development Approach & Life Cycle and Delivery would be useful for implementation.

Value or benefits got from the project have to be assessed to ensure they are under principles of following a circular life cycle and sustainability.

Tailoring would be required because every project could be different in each situation and will depend on the requirements at the stages of repair, reuse or refurbish/re-manufacture.

Considering project performance domains, the following areas would be significant:

**Uncertainty**: Repairability would be risk or uncertainty (unknown unknown) depending on type of project and context. Risk could be due to various reasons, e.g. parts availability, technical feasibility, cost or time schedule. Refer to Exhibit 9

**Development Approach**: Predictive or Adaptive, though for RRR type of projects, a predictive approach would normally apply.

**Life Cycle**: Will vary based on the type of project and the implementing organization.

**Delivery**: Scoping requirements | quality

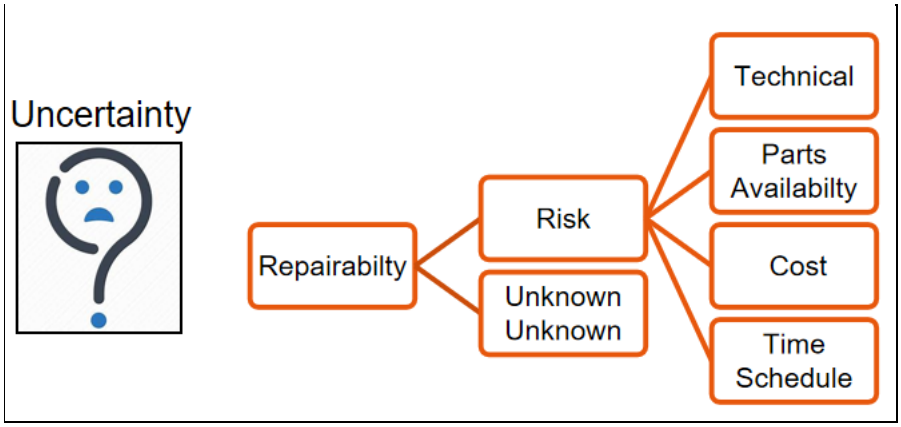



Exhibit 9: Uncertainty in 'Fix It' Projects

**Design for Repairability**

Historically, products have been designed from a customer's perspective. One can include here a dimension of 'Designing for repairability'. This would mean ease of dis-assembly and fair access to repair information, fair pricing and availability of parts. This approach has to be incorporated as part of the product design and development. Here, product management will help in ensuring that it is part of the supply chain with the required communication with customers and stakeholders.

This would mean, at the very minimum, products should be created for ease of repair from the time they are conceptualized. A modular, shared approach to design makes it easy to identify and either fix or replace only the malfunctioning part.

To enable better design for repairability, the following ways of design can be productive.

Emotion: Make a product which people want to keep, e.g. Personalize it. Create sentimental value. Instead of throwing away, they are more likely to keep it.

Dis-assembly: Product should be easy to dismantle if required, using basic tools. Substitute adhesives with fasteners or swap security screws with standard screws. Parts most likely to fail should be most accessible.

Modularity: Make them in modules or sub-assemblies. This will make it easier for the user to do the repair instead of using a professional service.

Repair Guide: Provide easy-to-understand manuals, repair instructions and access to videos.

Repair Service: Provide repair service for your product. Go beyond by taking responsibility beyond the point of purchase, not just help in providing parts. This service will earn your customer trust and loyalty.

Durability: Choice of materials can help in making the product robust, preventing breakages and making the product life longer.

The Right-to-Repair movement has helped more and more organizations embrace the need to look at repairability as a criterion while designing a product.

An example of a focus on repairability is the research project on 'product design for circular economy' where the transition in design product life extension reuses refurbishing and recycling. This created a Dis-assembly map along with design methodologies for redesign became inputs for a new scoring system for repair and upgrade of products, I.e. vacuum cleaners product group.

Since many products have not been including repairability factors in their product development, 'Design for repairability' would be a project for various organizations. Along with the processes, it will also need to change management and management of stakeholders for it to become effective. As it is a part of the product development process, product management also has a role.

**DIY**

Many of the repair or 'Fixit" jobs can ideally be undertaken as Do-it-yourself projects. Here, this will depend on how well the manufacturer has envisaged and enabled it to happen by providing the right support - through the right manuals, online and visual media help.

## Final Thoughts

- ✧ Focus on Sustainability of the Environment, Energy and Resources is creating an interest in the benefits of RRR* to solve a global problem.
- ✧ Implementing RRR* as a method has its own challenges: economics, politics, business interests & culture.
- ✧ If RRR* is considered as a project, then the best practices for implementation can be gainfully employed. Incorporating it as an integral part of product management will help in visualizing it from a marketing and business perspective.

* RRR Repair Reuse and Refurbish/Re-manufacture

## References

C40 Cities Climate Leadership Group, How to grow your city's reuse and repair economy www.c40knowledgehub.org

De Fazio, F. (2019) Enhancing consumer product repairability https://delftdesignlabs.org

Elkington, T. (2021) Right to Repair: 6 Design for Repairability Principles LinkedIn

Stewards for Consumers (2023) Where does your e-waste go? e-stewards.org

Gramling, C. (2020) Earth's annual e-waste could grow to 75 million metric tons by 2030 Science News

iFixit (2023) Smartphone Repairability Scores. www.ifixit.com

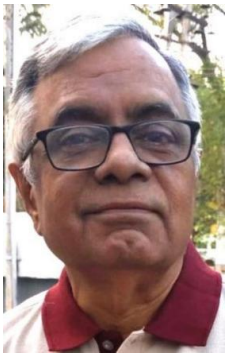
Mead, D. (2020) Text excerpts from Design for Repair: Things can be fixed Lectorates Design

Rajan, M. Ramachandran S. (2021) The Right to Repair and a New Era of Sustainability Infosys Knowledge Institute

Rao, R. (2023). Circular Economy: What does it mean for Project Professionals? PM World Journal, Vol XII, Issue X, October.

The World Counts (2023) Tons of electronic waste thrown out https://www.theworldcounts.com/challenges/planet-earth/waste/electronic-waste-facts

## About the Author



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