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Uber For Tractors: Hiring Agricultural Equipment Through Mobile Application

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Abstract

A laser guided land leveller harnesses technology to accurately flatten a field in a fraction of the time used by a traditional oxen powered scraper. Farmers can save precious groundwater and increase productivity by 10 to 15%. Such hi-tech levelers cost at least 3 lakh rupees, way beyond the reach of the average small farmer. This is where the app can be useful like from uber one can book a taxi similarly farmer can hire agricultural machines. Say, a farmer needs a rotovator with tractor for 1 acre land the app will show nearby custom hiring centers within 5-20 km radius so that famers can book it by contacting the person by using the app and book the equipment at a specific time and location.

Introduction

To realize their full potential, agricultural automation technologies must be accessible to all, not least to small-scale agricultural producers in low-income countries where hand tools and animal power are still in common use, hampering agricultural productivity and negatively affecting livelihoods. In other words, the automation process must become scale-neutral. In favorable circumstances, it may even be possible to leapfrog the technological evolution, passing directly from low-tech agriculture based on manual labor or draught animal power to agricultural automation (Gulati and Juneja, 2020).

This can be achieved through technologies that are scale-neutral by design, through innovative institutional arrangements (e.g. cooperatives and associations), or through market mechanisms that enable small-scale agricultural producers to overcome scale constraints. For example, expensive and complex agriculture equipment can be made available to local farmers through hire service providers, often producers themselves who have invested in draught animals and/or tractors and similar equipment. Digital tools also hold great promise for hire services. They can create new business models for the adoption of automation technologies by small-scale agricultural producers. One such scheme is Uber for tractors; similar to the Uber

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taxi application, it allows producers to access tractor hire services. Robotics and AI are based on digital technologies; therefore, countries need to push for wider access to digital technologies, promoting the essential infrastructures, appropriate legal frameworks, and necessary knowledge and skills (Seth and Ganguly, 2020).

To achieve this, both agricultural producers and governments must first recognize the economic, social and environmental benefits of the dissemination and adoption of digital technologies. Thereafter, it is vital to ensure availability, inclusivity, accessibility and adaptability to local conditions, reaching out to the wide range of potential beneficiaries in order to avoid widening the technological divides that disadvantage vulnerable groups (e.g. women) and remote territories.

Turning Challenges into Opportunities

Creating an "Uber for tractors" could involve developing a platform connecting farmers in need of tractor services with available tractor operators. Users could request tractor services for various agricultural tasks like plowing or planting, and nearby tractor operators could fulfill those requests. The platform would streamline the process of accessing agricultural machinery, improving efficiency in the farming sector.

The concept of an "Uber for tractors" addresses several important agricultural challenges:

- **Efficiency:** It enhances efficiency by connecting farmers with available tractor operators quickly. This can lead to timely completion of crucial farming activities, especially during peak seasons.
- **Access to Machinery:** Small and medium-scale farmers who may not own expensive tractors can still access the necessary machinery for their fields. This democratizes access to agricultural equipment.
- **Cost-Effectiveness:** For farmers who don't require a tractor year-round, hiring one when needed is more cost-effective than purchasing and maintaining the equipment.
- **Increased Productivity:** Timely access to tractor services can improve overall farm productivity by ensuring tasks like plowing, seeding, or harvesting are completed on schedule.
- **Income Generation:** For tractor operators, it provides a platform to offer their services to a broader market, potentially increasing their income by utilizing their equipment more efficiently.

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- **Technology Integration:** The platform could incorporate technology for efficient scheduling, real-time tracking, and secure payment systems, making the process more streamlined and user-friendly.

Custom Hiring Centres App

The Indian government has released a mobile application to facilitate the rental of pricey farm equipment. With the use of this software, Customer Hiring Centers (CHCs) will be connected, much like Uber does when a person needs a taxi. Currently, the nation has over 38,000 custom hiring centers (CHCs) that rent out 2.5 lakh pieces of farm equipment annually. The CHCs with equipment accessible within 5, 20, and 50 km of the area will be displayed on the app along with their fees. States like Chhattisgarh, Madhya Pradesh, Rajasthan, and Punjab are effectively using it.

Customer Hiring Centers (CHCs) are essentially a collection of farm equipment, machinery, and tools available for rent by farmers. Due to their financial situation, marginal farmers—those with land holdings of less than two hectares—are unable to purchase farm equipment outright or through institutional financing. Therefore, there is a strong push for communal ownership or custom hiring centers in an effort to make farm machinery more accessible to small and marginal estates of land. The CHCs are ought to be situated at a range from 5 to 7 – 40 to 50 km radius around land holdings. This will cut down on the price and duration of agricultural machinery transportation (The Hindu, 2019).

The current government's Custom Hiring Model and the private sector's Uberization Model are two new innovative on-demand business models that provide farmers with farm machinery and equipment (such as harvest combines and tractors) as well as operator services at affordable prices and at any time. As previously stated, mechanizing tiny and non-contiguous land tracts is not economically feasible, particularly for processes such as field preparation, sowing, and harvesting, because of small and marginal holdings as India's average farm size continuously shrinks, from 2.28 ha in 1970–71 to 1.08 ha in 2017–18. So consequently, both the 'Uberization Model' and the 'Custom Hiring Model' can provide access to cutting-edge technologies tailored to the crop and soil profile without requiring a large financial investment (Ganguly, Gulati, & Braun, 2017). These models are an innovation in the institutional framework that might make farm machinery and equipment accessible to farmers on a 'pay per use' basis. This could result in even more time and labor savings, lower crop production costs

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and postharvest losses, and increased crop output and farm income. Furthermore, it may allow new machines to be used to their full capacity, making it a more efficient and financially sustainable firm.

Table 1. Prevailing custom hiring rates for different implements

Name of equipment	Hiring charges in local market (INR/hour)	Rate charged by CHCs (INR/hour)
Tractor with rotavators	1200	950
Tractor with cultivators	800	650
Tractor with seed drill	800	700
Power tiller	600	500
Brush cutter without fuel	350 per day	300 per day
Thresher	1000	850
Paddy combine	1400	1200

The Sub-Mission on Agricultural Mechanization (SMAM) Scheme, implemented by the Government of India (2016-17) under the aegis of the National Mission on Agricultural Extension & Technology (NMAET) in 2014-15, is the origin of the Custom Hiring Model. The scheme's goal was to expand farm mechanization's reach to farmers with small and marginal holdings, as well as to places with low farm power, compensating for adverse economies of scale, which means a high cost of individual machinery ownership for a small holder farmer. The central government promoted the establishment of Custom Hiring Centres (CHCs) to provide hiring services of various types of agricultural machinery with a financial assistance level (subsidy) of 40% (of the machine cost) to farmers, entrepreneurs, and societies willing to set up these CHCs under this program. These CHCs must cover a minimum of 10 ha per day and at least 300 ha per cropping season. Furthermore, in order to encourage the employment of high-tech, high-value machines for increased productivity, the government encourages the construction of hi-tech centers with a financial aid level of 40% (of the machine cost). Each cropping season, these hubs must cover at least 500 acres. The government also gives an 80 percent subsidy to stimulate the creation of farm machinery hubs (also known as farm machinery banks) for custom hiring in selected areas, with a minimum of 8 farmers per hub/bank. 14 KVKs/manufacturers/Approved Testing Centers and ICAR centers will provide

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technical help to established CHCs and hi-tech hubs for maintenance and training (Government of India, 2018).

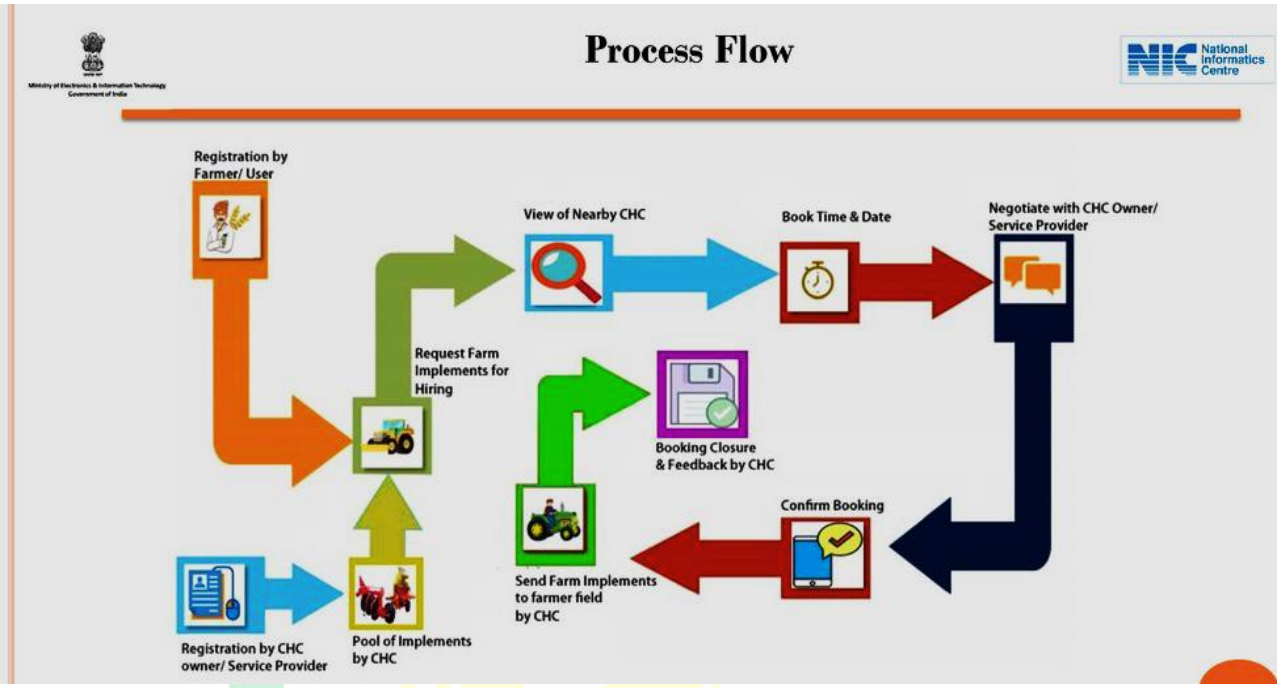

Fig 1. Process flow of custom hiring center app booking

Summary

Uber for tractors" could involve developing a platform connecting farmers in need of tractor services with available tractor operators. Users could request tractor services for various agricultural tasks like plowing or planting, and nearby tractor operators could fulfill those requests. The platform would streamline the process of accessing agricultural machinery, improving efficiency in the farming sector. In summary, an "Uber for tractors" addresses the resource and operational challenges in agriculture, making it a valuable solution for both farmers and tractor operators.

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