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# Implementation of Ionic 2 Typescript in Software
# (Case Study: Agystia Baby Toys Rental)

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## Abstract:

Software development is growing very rapidly, especially mobile based software, and brings great influence to changes in almost all fields, globally. Making efficiency in the process of creating mobile-based software. Ionic 2 Typescript mobile-based framework is a framework of software that can run on few different mobile operating systems like Android, iOS and Windows Phone. Ionic 2 concept, itself, is to create applications that able to run on different Operating System. As for this concept, enterprise will be able to cut the cost of making applications in vary mobile-based Operating System.

*Keywords* —**Ionic 2, Typescript, Android, iOS, Windows Phone**

## I.    INTRODUCTION

Software development is growing very rapidly, in Indonesia, especially mobile based software. Along with the development of Information and Communication Technology, it brings great influence to change in almost all fields, globally. The role of Information Systems in an enterprise considered very important, especially on supporting the company on product or service enhancement and/or be competitive. Small, medium and large enterprises are developing mobile-based software for an easy access where users conveniently able to access without being limited by time and location, as well as without having to open their Personal Computer or Notebook.

Ionic 2 Mobile-based Typescript Framework is a framework of software that able to run on different mobile operating systems like Android, iOS and Windows Phone.

Android is an open operating system on mobile phones that are Linux based operating system. Android can be used by anyone who wants to use it on their device. Android provides an open platform for developers to create their own applications that will be used for various mobile devices (Nasruddin Safaat, 2012).

Ionic 2 concept is to create applications that can run on different operating systems. Ionic Framework, itself, is an open source SDK (Software Development Kit) that allows developers to build high-quality mobile applications using familiar web technologies (HTML, CSS, and JavaScript). Ionic is mainly focused on the look and appearance, or UI (User Interface), of an application.

Creating effective technology, mediated through prototype approach (prototyping) where the development and testing of the working model (prototype) of the application to be developed will be through the process of repeated interaction and through continuous improvement to achieve conformity with what is required by the user). Appropriate application of course will greatly assist its user in effortless and speediness of completion of various tasks, whether on a small scale or large.

Based on the above, this study conducted to research how to implement Ionic 2 Typescript Framework on software development, which can run on different operating systems, to generate efficiency in the process of making mobile-based software.

## II. METHOD OF RESEARCH

### A.  Setting and Installation

The installation procedure of Ionic and Cordova is quite simple. Before its installation, please ensure to install Node JS. The source can be downloaded at nodejs.org. To perform a global installation, the

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following commands can be input in the installed terminal of the required package.
Global installation:

**npm install –g ionic cordova**

Once the basic Ionic 2 app is installed, please use the following command to check:

**ionic –v**
**cordova-v**

To build a new application in Ionic 2, **ionic serve** can be used in terminal after setting up the appropriate directory where the project is stored. The command will result in application display in the default browser on the computer. If you would like to display results of applications with different versions of browser, you can use **ionic serve -cls**, it will shows 3 versions of display of Android, Windows and IOS.

To run the application on emulator/phone device must add a platform on the application project by adding: **ionic platform add [android/ios]**, on terminal.

To run the application on the emulator can use this command: **ionic [run/emulate] [android/ios]**

### B. Software Specification

Some tools and software are used, to build this application. Applications are built and tested on Windows platform using command line interface. One of them is the use of NodeJS Version 4.4.0. To write TypeScript and CSS Script, the text editor used is Visual Studio Code. Web Browser used for deployment and debugging is Google Chrome 49.0.2623.87version.

### C. Alteration of Hybrid Application Development Methodology

Fig. 1 illustrates the basic concept sketches for build the application from scratch. The concept sketch highlights various aspects needed in order to design, build, test, debug and run the applications.
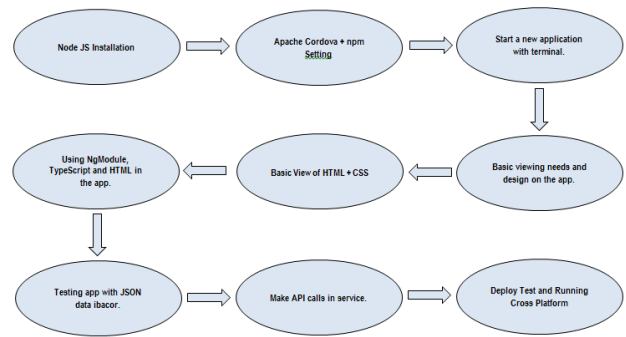


Fig. 1 Alteration of Hybrid Application Development Methodology

## III. DISCUSSION

### D. Design and Implementation

Fig. 2 displays the Entity Relationship Diagram (ERD) of Agystia Baby Toys Rental.
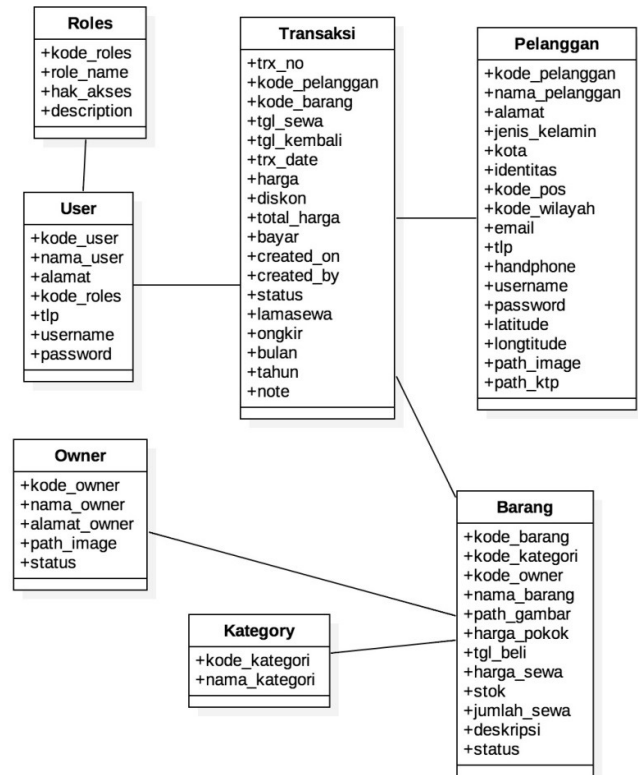


Fig. 2. Entity Relationship Diagram (ERD) of Agystia Baby Toys Rental

TABLE 1
ENTITY RELATIONSHIP DIAGRAM (ERD) OF AGYSTIA BABY TOYS RENTAL

| No. | Menu | Description |
|---|---|---|
| 1 | Roles | Table of role's storage/user access. |
| 2 | *Transaksi* (Transaction) | Table used to record all Agistya Rental transactions. |
| 3 | *Pelanggan* (Customer) | Agystia Rental customer list table. |
| 4 | *Barang* (Items) | Table list of items in Agistya Rental. |
| 5 | User | Table list of users who can access Agistya Rental application. |
| 6 | Owner | Table list of owners who have items in Agistya Rental (in the case that there is toys rental joint). |
| 7 | *Kategori* (Category) | Table for category of items in Agistia Rental. |

### E. Application's User Interface

Fig. 3 shows the Login menu of Agystia Baby Toys Rental on mobile device. This Login menu is used by Rental Owners to manage their toys rentals. Rental owners can perform toys data maintenance, at anywhere and anytime, by just entering the username and password that has been registered.
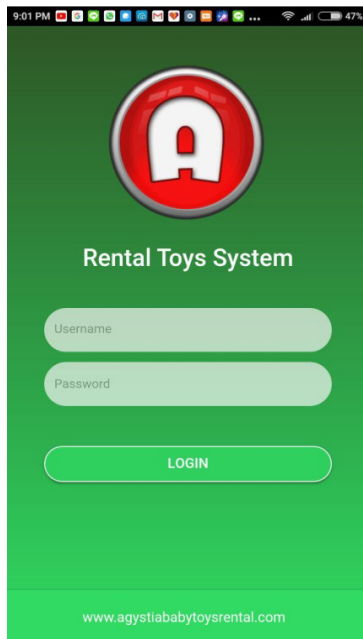


Fig. 3Login Menu Captureof Agystia Baby Toys Rental

Fig. 4 pose the side menu (menu list) of Agystia Baby Toys Rental application. Rental owner can access the following menus: Toys List, Out of Rent, Booking List, Outstanding List, Customer List, Owner List, Rental Transactions, Monthly Report, and Annual Report, including Asset List.

TABLE 2
AGYSTIA BABY TOYS RENTAL APPLICATION' SIDE MENU (MENU LIST)

| No. | Menu | Description |
|---|---|---|
| 1 | *Daftar Mainan* (List of Toys) | List of toys that available in Agystia rentals. |
| 2 | *Habis Sewa* (Out of Rent) | List of customers who have an overdue rental. |
| 3 | *Daftar Booking* (Booking List) | List of customer's booking records. |
| 4 | *Daftar Tunggakan* (Outstanding List) | List of customers who still have rental arrears. |
| 5 | *Daftar Pelanggan* (Customer List) | List of existing customers in Agystia. |
| 6 | *Daftar Owner* (Owner List) | List of toys owners (in the case that there is toys rental joint). |
| 7 | *Transaksi Sewa* (Rental Transaction) | Transaction module used to record rental transactions. |
| 8 | *Laporan Bulanan* (Monthly Report) | Displays monthly reports of Agystia Rental. |
| 9 | *Laporan Tahunan* (Annual Report) | Displays annual reports of Agystia Rental. |
| 10 | Asset | Displays the total assets owned by Agistya Rental. |

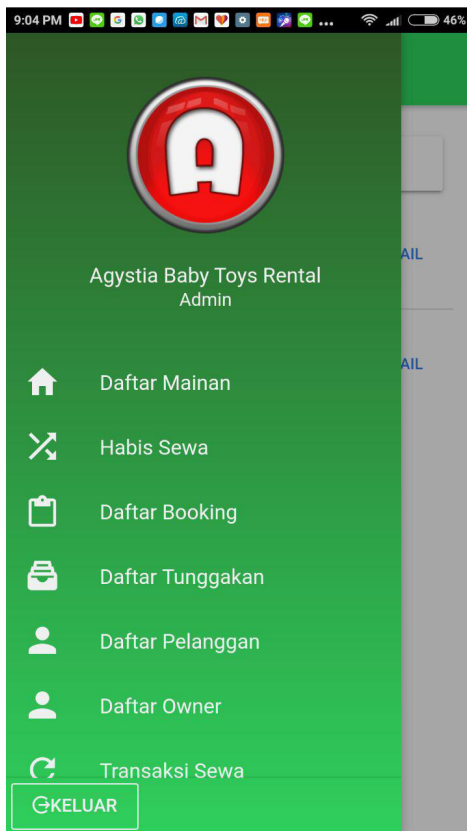Fig. 4Side Menu Captureof Agystia Baby Toys Rental

Toys List (*List Mainan*) menu is used for adding toy rental list. Rental owner adds name of the toy, rental price and original price of the toy that used in profit calculation. It's captured in Fig. 5.
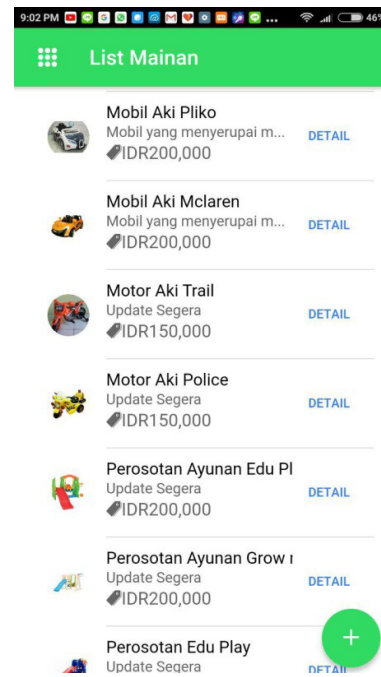


Fig. 5Capture of Toys List

Fig. 6 captures the Arrears List. Arrears List (*Daftar Tunggakan*) is a list of tenants who make arrears on rent. It contains of outstanding returning items (toys) along with its customer's detail, item and outstanding amount. This overdue may occur because at time of lease renewal where the lessee makes payments upon repayment.
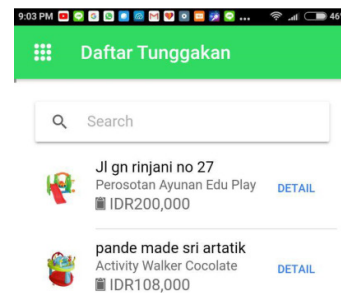


Fig. 6 Capture of Arrears List

Rent Transactions are used by rental owner to include toy rental schedule of its customers, hence toy that overdue to returned, can be seen. It shows in Fig. 7.
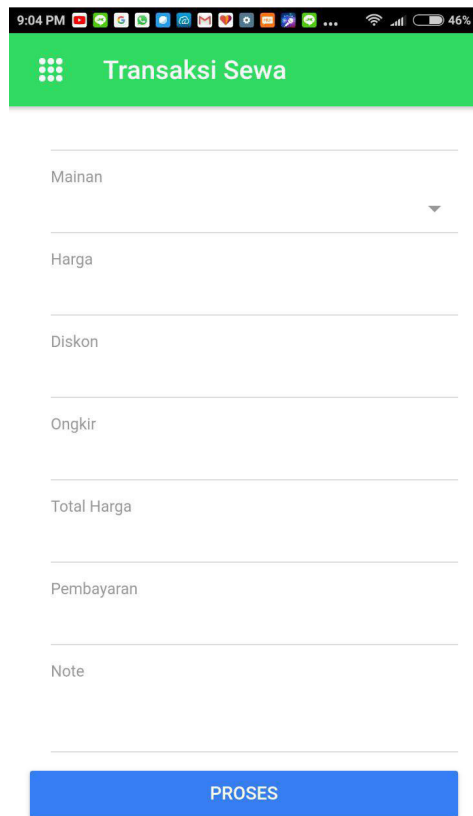
Fig. 7 Rent Transactions' Capture

TABLE 3
RENT TRANSACTIONS' MENU

| No. | Menu | Description |
|-----|------|-------------|
| 1 | *Mainan* (Toys) | Choice of toys for rent. |
| 2 | *Harga* (Price) | Price will be calculated automatically by system according to the input of items. |
| 3 | *Diskon* (Discount) | Discount determined by rental owners input. |
| 4 | *Ongkir* (Courier Fee) | Delivery fee, according to distance, calculated by rental owner. |
| 5 | *Total Harga* (Total Amount) | Price that calculated automatically; which is the total price to be paid by the tenant. |
| 6 | *Pembayaran* (Payment) | The amount of payments paid by tenant (can be a down payment or a fully paid) |
| 7 | Note (Remarks) | Notes that can be used by owner, i.e. as a reminder. |

## IV. CONCLUSIONS

The research attests that Ionic Framework 2 successfully runs on mobile devices and is ready for use in mobile applications projects. Accordingly, on this study case, Ionic 2 Implementation in Agistya Rental software is ready for use.

User-end wise, a software used for client (tenant) are recommended. Not only covering the maintenance from the rental owner's side, as discussed in this study.

## ACKNOWLEDGMENT

## REFERENCES

1. *Dewanti, P., & Permana, P. A. G. (2017). Pengembangan Aplikasi Hybrid Menggunakan Ionic 2 Framework dan Angular 2*. E-Proceedings KNS&I STIKOM Bali, *396-400.*

2. *Griffith, C. (2017).* Mobile App Development with Ionic, Revised Edition: Cross-Platform Apps with Ionic, Angular, and Cordova. *" O'Reilly Media, Inc.".*

3. *Gupta, A., & Gaffar, A. (2016). Hybrid Application Development using Ionic Framework & AngularJS.* International Journal of Innovative Research in Computer Science & Technology (IJIRCST), 4(2), 62-64.

4. *More, K. A., & Chandran, M. P. (2016). Native Vs Hybrid Apps.* Proceeding of International Journal of Current Trends in Engineering & Research, *563-572.*

5. *Murray, N., Lerner, A., Coury, F., & Taborda, C. (2016). ng-book 2: The Complete Book on Angular 2 (Volume 2).*

6. *Phan, H. (2015).* Ionic Cookbook. *Packt Publishing Ltd.*

7. *Safaat, N. (2012). Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android.* Bandung: informatika.