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JavaScript(https://www.sitepoint.com/javascript/) - January 25, 2017 - By Joyce Echessa (https://www.sitepoint.com/author/jechessa/)

Building a Facebook Chat Bot with Node and Heroku

Building a Facebook Chat Bot with Node and Heroku was peer reviewed by Joan Yin (https://github.com/newjsn) and Camilo Reyes (https://www.sitepoint.com/author/creyes/). Thanks to all of SitePoint's peer reviewers for making SitePoint content the best it can be!

At last year's f8 conference, Facebook launched the Messenger Platform (https://developers.facebook.com/docs/messenger-platform), giving developers the ability to create bots that could have a conversation with people on Messenger or from a Facebook Page. With bots, app owners can better engage with their users by providing personalized and interactive communication that can scale for the masses. Since the launch, businesses and app owners have shown great interest in the chat bots. Just three months after the announcement, there was an estimated 11,000 bots (http://www.forbes.com/sites/kathleenchaykowski/2016/07/01/more-than-11000-bots-are-now-on-facebook-messenger/#4de652526b82) built on the platform.

Businesses and app owners aren't the only ones benefiting from chatbots. Users of these bots can enjoy a myriad of services such as:

- getting immediate customer support
- booking a flight (http://venturebeat.com/2016/06/23/hipmunk-embraces-bots-with-an-a-i-travel-assistant-for-facebook-messenger-and-slack/)
- buying a movie ticket
- getting Netflix movie recommendations (http://www.andchill.io/)
- getting the weather forecast (https://poncho.is/)
- keeping up with the news (https://www.messenger.com/t/cnn/)
- getting advice on what to wear (https://blog.gofynd.com/meet-fify-your-new-botfriend-8c04de85601c#.vp2oteghe)
- getting ideas of what to have for dinner (https://dinnerideas.io/) depending on the ingredients at hand
- entertainment (https://www.facebook.com/storiesonsequel/).

The current interest in and appeal of chatbots is obvious and as the technology in artificial intelligence improves, the bots will get better at interacting with users.

In this article, we'll look at how to create a Facebook chatbot that can interact with users via Messenger on behalf of a Facebook Page. We'll build a bot that gives the user different details regarding a movie that they specified.

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Do I Need to Know AI to Build a Bot?

Being skilled in AI will certainly help, especially in building sophisticated bots, but is not required. You can certainly build a bot without knowing machine learning.

There are two types of bots you can build. One is based on a set of rules and the other uses machine learning. The former is limited in the interactions it can offer. It can only respond to specific commands. This is the type of bot we'll be building.

With bots that use machine learning, you get better interaction with the user. The user can interact with the bot in a more natural way as they would in a human to human interaction, as opposed to just using commands. The bot also gets smarter as it learns from the conversations it has with people. We'll leave building this type of bot for a future article. Machine learning knowledge will not be necessary, though. Lucky for us, there are services such as wit.ai (https://wit.ai/) and Api.ai (https://api.ai/) that enable developers to integrate machine learning (specifically Natural Language Processing – NLP) into their apps.

Getting Started

You can download the code for the completed demo app here (https://github.com/sitepoint-editors/spbot).

For your chat bot to communicate with Facebook users, we'll need to set up a server that will receive, process and send back messages. The server will make use of the Facebook Graph API for this. The Graph API is the primary way to get data in and out of Facebook's platform. The server must have an endpoint URL that is accessible from Facebook's servers, therefore deploying the web application on your local machine won't work, you have to put it online. Also, as of version 2.5 of the Graph API, new subscriptions to the service have to use a secure HTTPS callback URL. In the tutorial, we'll deploy the app to Heroku as all default `appname.herokuapp.com` domains are already SSL-enabled. We'll use Node.js to build the web application.

To get started, first make sure Node (https://nodejs.org/) is installed on your computer. You can check this by typing `node -v` in the Terminal. If installed, it will output the version number. Then install the Heroku Command Line Interface (https://devcenter.heroku.com/articles/heroku-command-line) (CLI). We'll use this later to push the app to Heroku. Use `heroku --version` to verify that the CLI is installed.

Create the project directory and initialize a `package.json` file with the following commands.

```
$ mkdir spbot
$ cd spbot
$ npm init
```

Follow the prompts to set your preferences for the project.

After the `package.json` file has been generated, open it and add a `start` property to the `scripts` object. This lets Heroku know what command to execute to start the app. During project setup, I defined `app.js` as the entry point of the app, thus I'm using `node app.js` as the value of `start`. Change this according to your project's settings.

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```
{
  "name": "spbot",
  "version": "1.0.0",
  "description": "SPBot Server",
  "main": "app.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" &amp;&amp; exit 1",
    "start": "node app.js"
  },
  "author": "Joyce Echessa",
  "license": "ISC"
}
```

Install the following Node packages.

```
$ npm install express request body-parser mongoose --save
```

Create a `.gitignore` file in your project's root directory and include the `node_modules` folder, to prevent it from being committed.

```
node_modules
```

In your project's root directory, create a file labeled `app.js` (or `index.js`, if you went with the default name). Modify it as shown:

```
var express = require("express");
var request = require("request");
var bodyParser = require("body-parser");

var app = express();
app.use(bodyParser.urlencoded({extended: false}));
app.use(bodyParser.json());
app.listen((process.env.PORT || 5000));

// Server index page
app.get("/", function (req, res) {
  res.send("Deployed!");
});

// Facebook Webhook
// Used for verification
app.get("/webhook", function (req, res) {
  if (req.query["hub.verify_token"] === "this_is_my_token") {
    console.log("Verified webhook");
    res.status(200).send(req.query["hub.challenge"]);
  } else {
    console.error("Verification failed. The tokens do not match.");
    res.sendStatus(403);
  }
});
```

The first GET handler will be for our own testing – to know if the app has been successfully deployed. The second GET handler is the endpoint that Facebook will use to verify the app. The code should look for the `verify_token` and respond with the `challenge` sent in the verification request.

You can paste your own token into the code. Such data is best saved in an environment variable (https://devcenter.heroku.com/articles/getting-started-with-nodejs#define-config-vars), which we'll do shortly after we create a project on Heroku.

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Deploying to Heroku

For the Facebook platform to connect with our backend application, we first need to put it online.

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Create a Git repository and commit the project's files with the following commands.

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```
$ git init
$ git add .
$ git commit -m "Initial commit"
```

Register for a free Heroku (https://heroku.com/) account if you don't already have one.

From your terminal, login to Heroku and create an application.

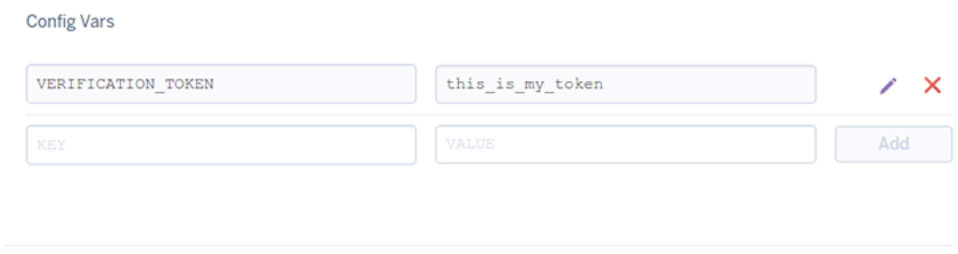
```
$ heroku login
$ heroku create
$ git push heroku master
$ heroku open
```

On running the `heroku open` command, the link to the running app will be opened in your default browser. If everything went well, you will get a page with the text **Deployed!** on it.

Creating Environment Variables

Before we continue, let's create an environment variable on Heroku to hold the app's Verify Token.

Open your Heroku Dashboard (https://dashboard.heroku.com/apps) and select the app that you just deployed. Go to the app's *Settings* and click on the *Reveal Config Vars* button. Enter `VERIFICATION_TOKEN` as the *Key* and your token as the *Value* and click *Add*.


Config Vars

VERIFICATION_TOKEN this_is_my_token

In your code, modify your token string (`"this_is_my_token"`) to `process.env.VERIFICATION_TOKEN`. Commit your changes and push them to Heroku.

Create a Facebook Page and App

With the server up and running, we'll now create a Facebook app and the Page it will be associated with. You can create a new Page or use an existing one.

To create a Facebook Page, log in to Facebook and head over to Create a Page (https://www.facebook.com/pages/create/). Select a Page Type from the given options. I chose *Entertainment*.

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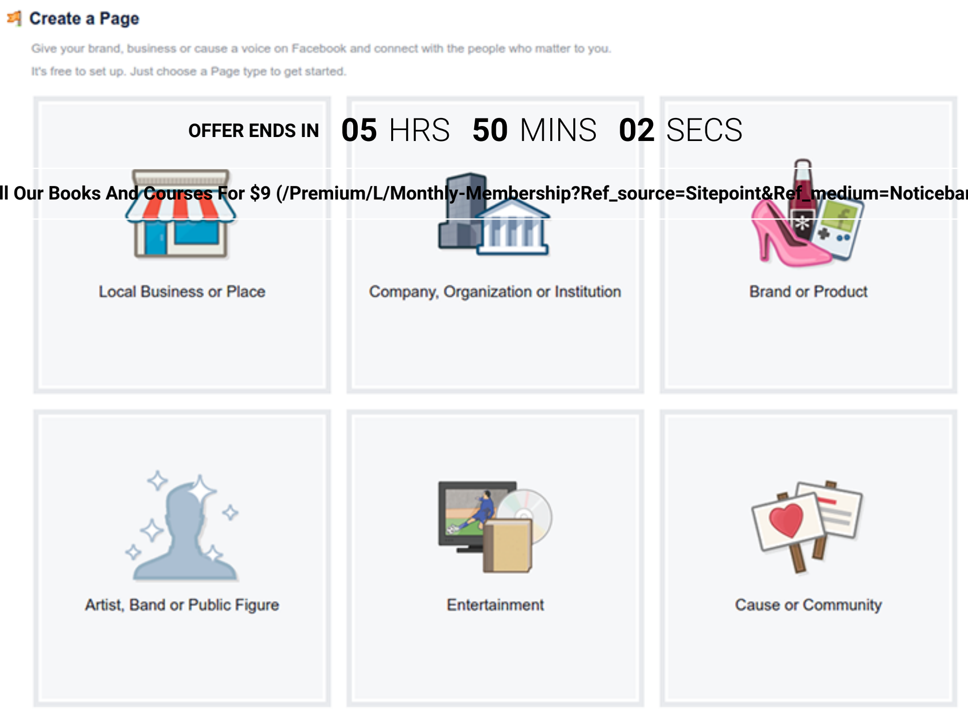
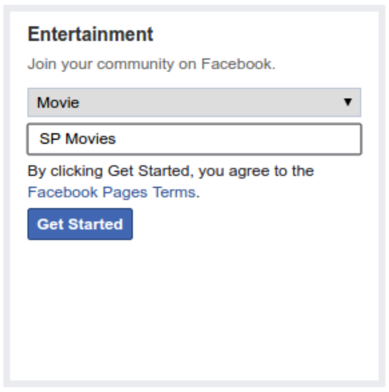
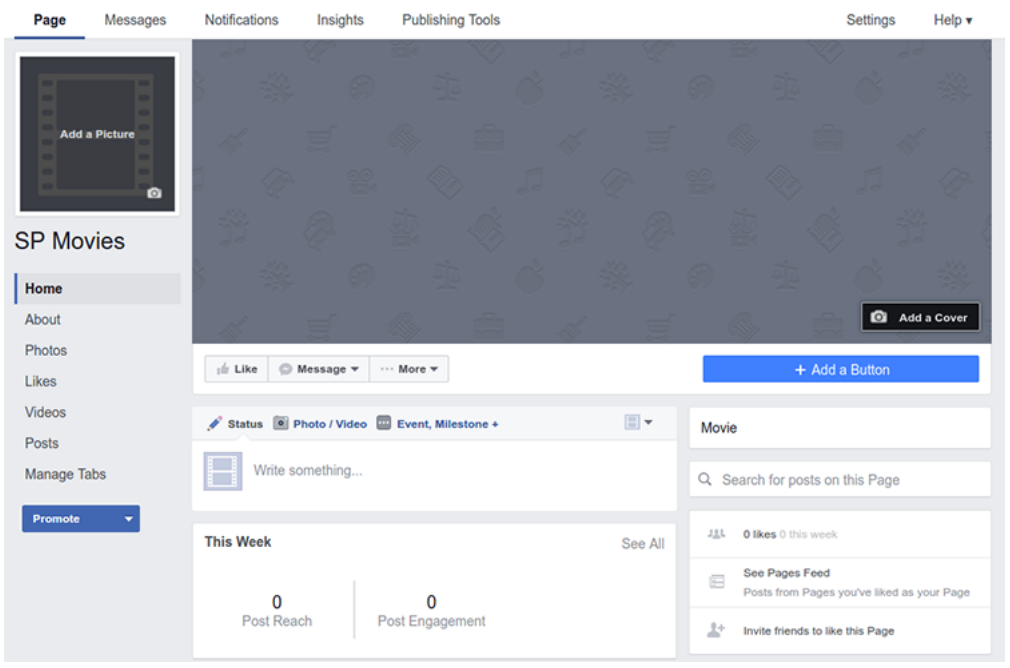

Create a Page
Give your brand, business or cause a voice on Facebook and connect with the people who matter to you.
It's free to set up. Just choose a Page type to get started.
Local Business or Place
Company, Organization or Institution
Brand or Product
Artist, Band or Public Figure
Entertainment
Cause or Community

Then select a Category and Name for the Page.


Entertainment
Join your community on Facebook.
Movie
SP Movies
By clicking Get Started, you agree to the Facebook Pages Terms.
Get Started

Ater clicking on *Get Started*, the Page will be created and you will be asked for more details regarding your app (description, website, profile picture, target audience, e.t.c). You can skip these setup steps for now.



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To create a Facebook App, head over to the [Add a New App (https://developers.facebook.com/quickstarts/)](https://developers.facebook.com/quickstarts/) page and click on the *basic setup* link below the other platform choices.

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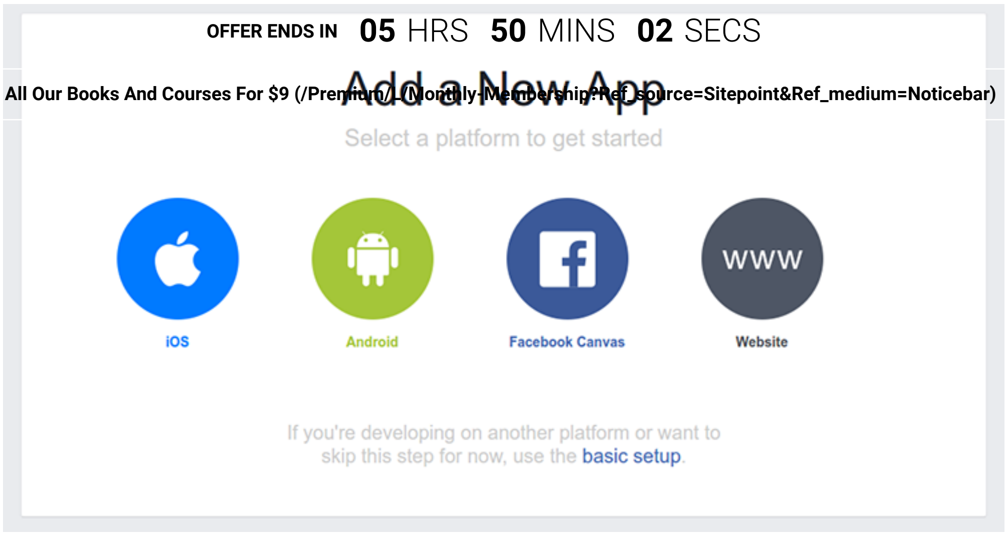
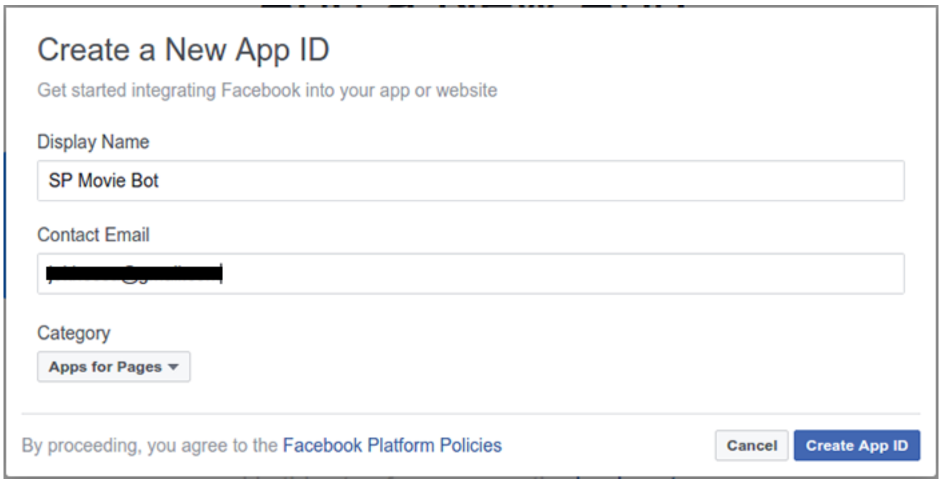

Add a New App

Select a platform to get started

If you're developing on another platform or want to skip this step for now, use the basic setup.

Fill in the necessary details. Select *Apps for Pages* as the Category.


Create a New App ID

Get started integrating Facebook into your app or website

Display Name

SP Movie Bot

Contact Email

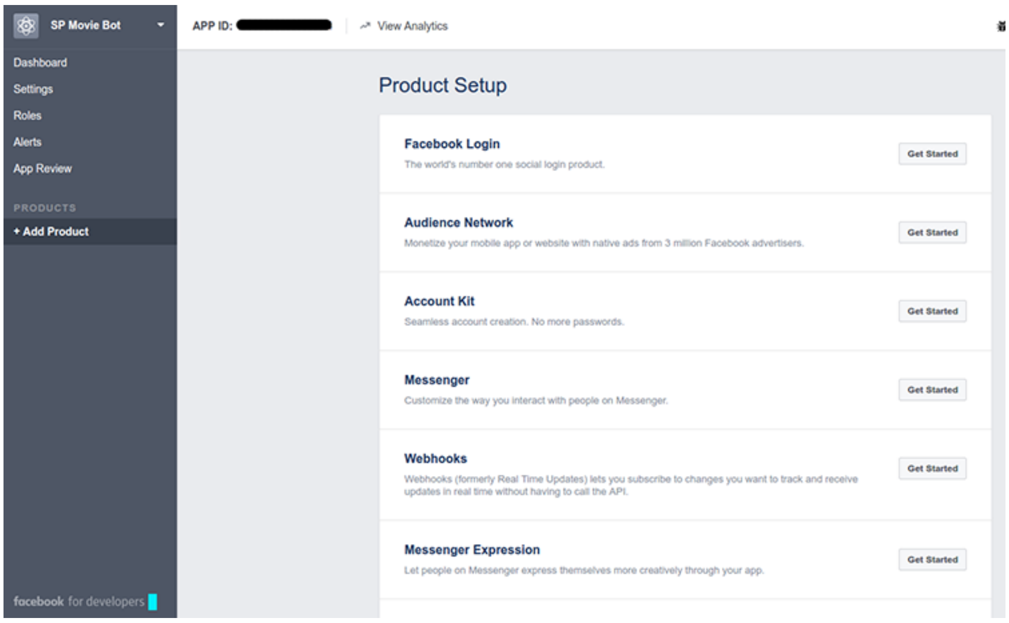
[redacted]

Category

Apps for Pages

By proceeding, you agree to the Facebook Platform Policies

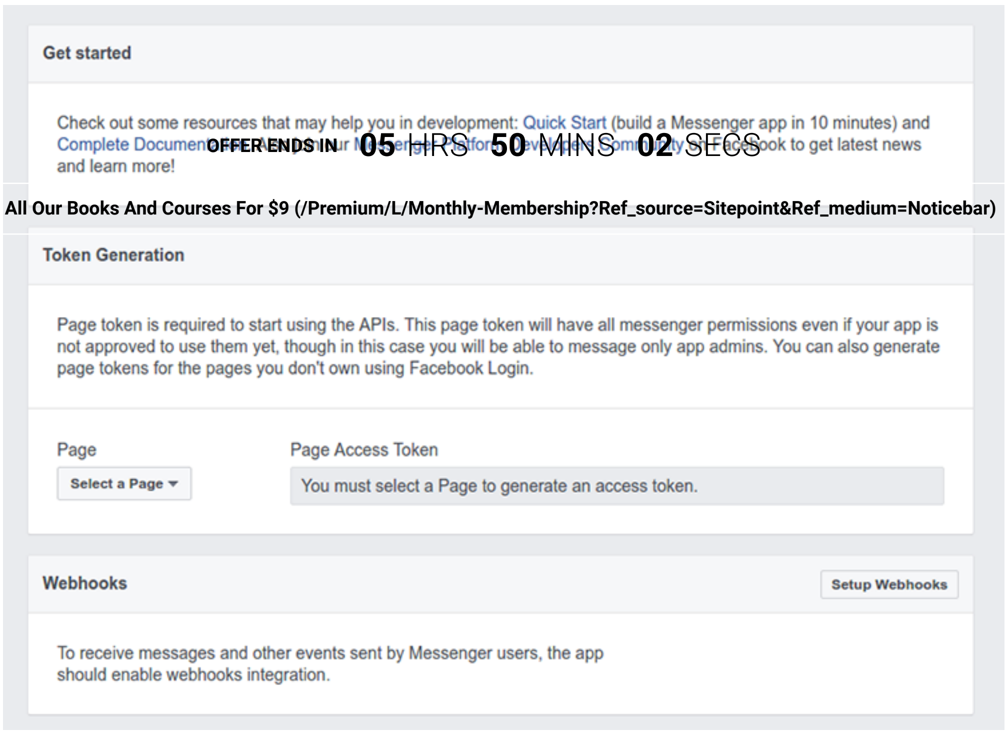
On clicking *Create App ID*, the app's dashboard will be opened.



Product Setup

Facebook Login	The world's number one social login product.	Get Started
Audience Network	Monetize your mobile app or website with native ads from 3 million Facebook advertisers.	Get Started
Account Kit	Seamless account creation. No more passwords.	Get Started
Messenger	Customize the way you interact with people on Messenger.	Get Started
Webhooks	Webhooks (formerly Real Time Updates) lets you subscribe to changes you want to track and receive updates in real time without having to call the API.	Get Started
Messenger Expression	Let people on Messenger express themselves more creatively through your app.	Get Started

From the *Product Setup* on the right, click on *Get Started* in the *Messenger* section. You will then be taken to the Messenger Settings page shown below.


Get started

Check out some resources that may help you in development: Quick Start (build a Messenger app in 10 minutes) and Complete Documentation. Join our Messenger Platform for Developers Community on Facebook to get latest news and learn more!

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Token Generation

Page token is required to start using the APIs. This page token will have all messenger permissions even if your app is not approved to use them yet, though in this case you will be able to message only app admins. You can also generate page tokens for the pages you don't own using Facebook Login.

Page: Select a Page

Page Access Token: You must select a Page to generate an access token.

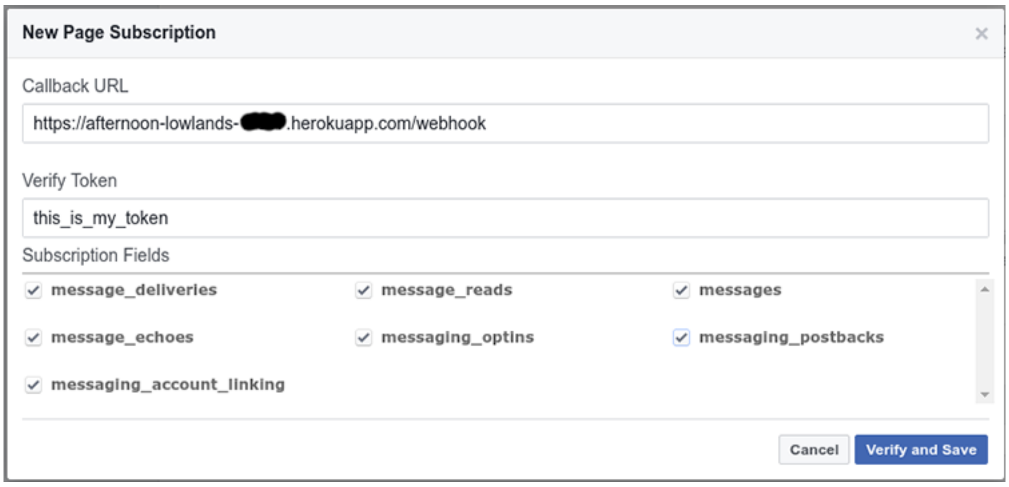
Webhooks

To receive messages and other events sent by Messenger users, the app should enable webhooks integration.

To receive messages and other events sent by Messenger users, the app should enable webhooks integration. We'll do this next. Webhooks (formerly *Real Time Updates*) let you subscribe to changes you want to track and receive updates in real time without having to call the API.

In the Webhooks section, click *Setup Webhooks*

Enter a callback URL where the updates will be sent (the endpoint URL defined in the backend app i.e. `<your-app-url>/webhook`), enter a Verify Token (the token used in the backend app, i.e. the value stored in `process.env.VERIFICATION_TOKEN`) and check all the checkboxes. These specify which events the app will be subscribed to. We'll see what these do a little later on.


New Page Subscription

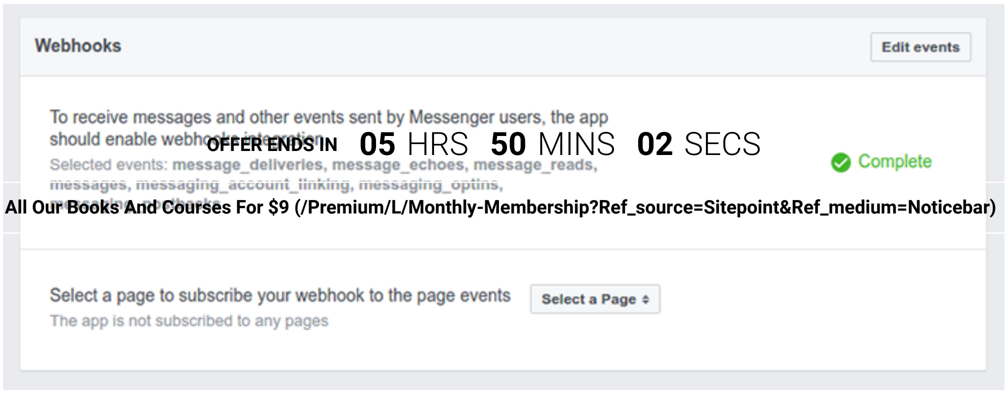
Callback URL: https://afternoon-lowlands-[redacted].herokuapp.com/webhook

Verify Token: this_is_my_token

Subscription Fields

✓ message_deliveries	✓ message_reads	✓ messages
✓ message_echoes	✓ messaging_optins	✓ messaging_postbacks
✓ messaging_account_linking		

On successfully enabling webhooks, you should see *Complete* in the Webhooks section and a list of the events subscribed to. If you get an error, make sure you have entered the correct URL for the webhook endpoint (ending with `/webhook`) and also make sure the token used here is the same one you used in the Node app.


Webhooks

To receive messages and other events sent by Messenger users, the app should enable webhooks integration.
Selected events: message_deliveries, message_echoes, message_reads, messages, messaging_account_linking, messaging_optins, messaging_postbacks

Select a page to subscribe your webhook to the page events
The app is not subscribed to any pages

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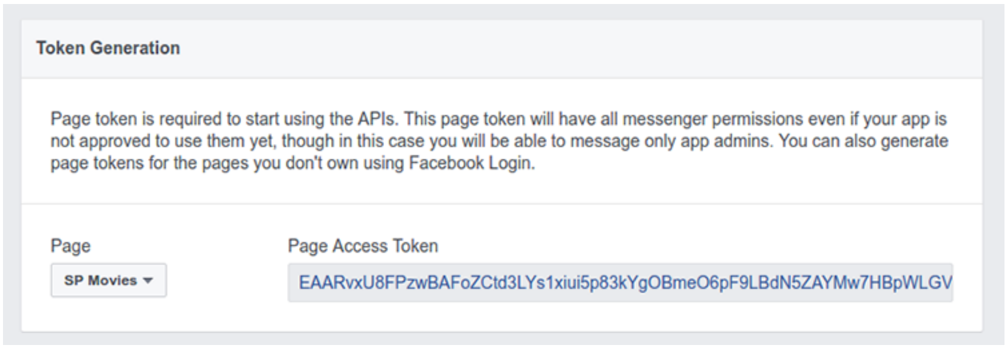
In the *Token Generation* section, select your Page from the dropdown menu. After authentication, a Page Access Token will be generated for you.


Token Generation

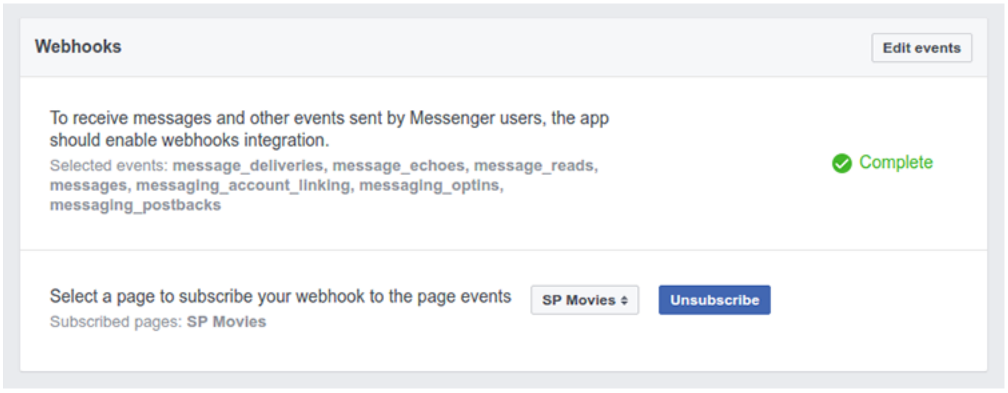
Page token is required to start using the APIs. This page token will have all messenger permissions even if your app is not approved to use them yet, though in this case you will be able to message only app admins. You can also generate page tokens for the pages you don't own using Facebook Login.

Page: SP Movies

Page Access Token: EAARvxU8FPzwBAFoZCtd3LYs1xiui5p83kYgOBmeO6pF9LBdN5ZAYMw7HBpWLGV

Create another environment variable on Heroku and set its *Key* to `PAGE_ACCESS_TOKEN` and the generated token as the *Value*. Note that the generated token will not be saved in the current page it is shown in on Facebook. Each time you go to that web page, the Page Access Token field will be blank and when you select your Facebook Page from the Page dropdown menu, a new token will be generated. However, any previous tokens created will continue to function. So make sure you copy the token before closing the web page.

In order for your webhook to receive events for a specific page, you must subscribe your app to the page. In the *Webhooks* section, select the page to subscribe to.


Webhooks

To receive messages and other events sent by Messenger users, the app should enable webhooks integration.
Selected events: message_deliveries, message_echoes, message_reads, messages, messaging_account_linking, messaging_optins, messaging_postbacks

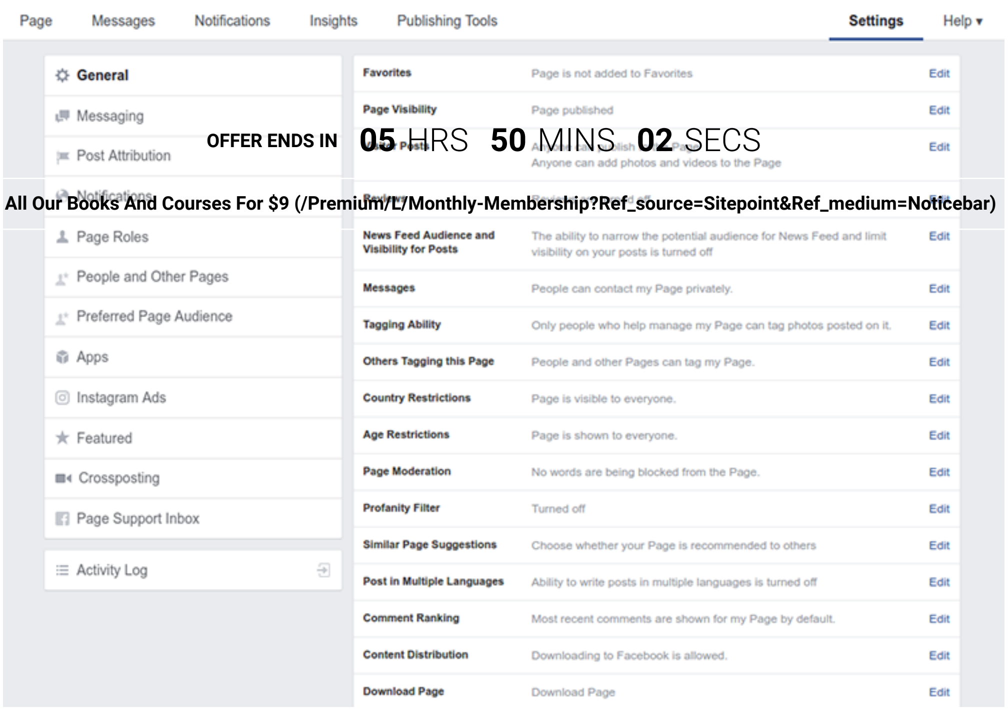
Select a page to subscribe your webhook to the page events
Subscribed pages: SP Movies

Welcome Screen

When a user starts a new conversation with your bot, the first thing they will see is the Welcome Screen. This screen will show your Page's name, description, profile picture and cover photo. You can customize the screen by setting Greeting Text (https://developers.facebook.com/docs/messenger-platform/thread-settings/greeting-text) that will be used instead of the Page description. You can use this to set an introductory message that will let the user's know what to expect from your bot.

By default, to start a conversation it is the user that sends the first message to your bot. You can, however, enable a Get Started button (https://developers.facebook.com/docs/messenger-platform/thread-settings/get-started-button) that will enable your bot to send the initial message. The button will send an event to your server that you can then respond to.

To set the greeting text, open your Page and go to its *Settings*.



Page | Messages | Notifications | Insights | Publishing Tools | Settings | Help ▾

- General
- Messaging
- Post Attribution
- Notifications
- Page Roles
- People and Other Pages
- Preferred Page Audience
- Apps
- Instagram Ads
- Featured
- Crossposting
- Page Support Inbox
- Activity Log

Favorites	Page is not added to Favorites	Edit
Page Visibility	Page published	Edit
Visitor Posts	Anyone can publish to the Page. Anyone can add photos and videos to the Page	Edit
Reviews		Edit
News Feed Audience and Visibility for Posts	The ability to narrow the potential audience for News Feed and limit visibility on your posts is turned off	Edit
Messages	People can contact my Page privately.	Edit
Tagging Ability	Only people who help manage my Page can tag photos posted on it.	Edit
Others Tagging this Page	People and other Pages can tag my Page.	Edit
Country Restrictions	Page is visible to everyone.	Edit
Age Restrictions	Page is shown to everyone.	Edit
Page Moderation	No words are being blocked from the Page.	Edit
Profanity Filter	Turned off	Edit
Similar Page Suggestions	Choose whether your Page is recommended to others	Edit
Post in Multiple Languages	Ability to write posts in multiple languages is turned off	Edit
Comment Ranking	Most recent comments are shown for my Page by default.	Edit
Content Distribution	Downloading to Facebook is allowed.	Edit
Download Page	Download Page	Edit

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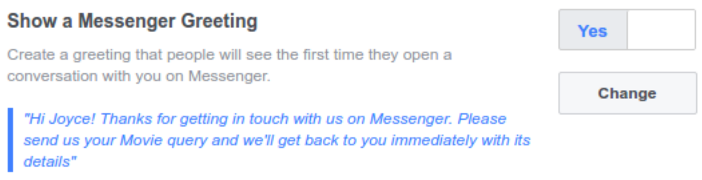
Select *Messaging* from the left panel and then turn on *Show a Messenger Greeting* on the right panel. Set the message to your liking.



Show a Messenger Greeting

Create a greeting that people will see the first time they open a conversation with you on Messenger.

"Hi Joyce! Thanks for getting in touch with us on Messenger. Please send us your Movie query and we'll get back to you immediately with its details"

To enable the Get Started button, replace the `PAGE_ACCESS_TOKEN` string in the following statement with your token and paste the command in Terminal.

```
curl -X POST -H "Content-Type: application/json" -d '{
  "setting_type":"call_to_actions",
  "thread_state":"new_thread",
  "call_to_actions":[
    {
      "payload":"Greeting"
    }
  ]
}' "https://graph.facebook.com/v2.6/me/thread_settings?access_token=PAGE_ACCESS_TOKEN"
```

The above makes a request to the Facebook Graph API. If the request is successful, a Get Started button will appear on the Welcome Screen of a new conversation. A user clicking on the button will trigger the postback received callback. Your bot can then respond to this postback.

Postbacks can be triggered by different types of components – a Postback button, Get Started button, Persistent menu or Structured Message. You can set any string as the `payload`. On the backend, we'll then use this string to identify the postback sent as a result of tapping the Get Started button. To receive postback messages, your app must be subscribed to postbacks on your webhook. We did this earlier by checking the `messaging_postbacks` checkbox when we were setting up the webhook.

If the Get Started button is successfully set, you will get the following response.

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```
{
  "result": "Successfully added new_thread's CTAs"
}
```

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Remember the *Welcome Screen* and *Get Started* button only appear for new conversations. When coding and testing your bot, you can start a new conversation by deleting the current one.

To process the postback message, paste the following in your Node app.

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```
// All callbacks for Messenger will be POST-ed here
app.post("/webhook", function (req, res) {
  // Make sure this is a page subscription
  if (req.body.object == "page") {
    // Iterate over each entry
    // There may be multiple entries if batched
    req.body.entry.forEach(function(entry) {
      // Iterate over each messaging event
      entry.messaging.forEach(function(event) {
        if (event.postback) {
          processPostback(event);
        }
      });
    });

    res.sendStatus(200);
  }
});

function processPostback(event) {
  var senderId = event.sender.id;
  var payload = event.postback.payload;

  if (payload === "Greeting") {
    // Get user's first name from the User Profile API
    // and include it in the greeting
    request({
      url: "https://graph.facebook.com/v2.6/" + senderId,
      qs: {
        access_token: process.env.PAGE_ACCESS_TOKEN,
        fields: "first_name"
      },
      method: "GET"
    }, function(error, response, body) {
      var greeting = "";
      if (error) {
        console.log("Error getting user's name: " +  error);
      } else {
        var bodyObj = JSON.parse(body);
        name = bodyObj.first_name;
        greeting = "Hi " + name + ". ";
      }
      var message = greeting + "My name is SP Movie Bot. I can tell you various details regarding movies. What movie would you like to know about?";
      sendMessage(senderId, {text: message});
    });
  }
}

// sends message to user
function sendMessage(recipientId, message) {
  request({
    url: "https://graph.facebook.com/v2.6/me/messages",
    qs: {access_token: process.env.PAGE_ACCESS_TOKEN},
    method: "POST",
    json: {
      recipient: {id: recipientId},
      message: message,
    }
  }, function(error, response, body) {
    if (error) {
      console.log("Error sending message: " + response.error);
    }
  });
}
```

Whenever someone interacts with your bot or sends your page a message, an update will be sent via your Webhook integration. To get the messages, you have to listen for POST calls at your webhook. All callbacks will be made to this webhook.

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In the POST handler above, we iterate over the messaging entries sent to the app. Sometimes messages are batched and sent together, so an entry may contain multiple objects. We then iterate through each entry's messaging event and check for its type. The following shows the different callback messages that can be sent to the app.

- *Message Received callback* – The Message received callback is sent when a person sends your bot a message. You must have subscribed to the `messages` event when you setup your webhook.
- *Postback Received callback* – The Postback Received callback is sent when a person clicks on a button that has been configured to send you a postback. In order to get a callback from a postback, you have to have subscribed to the `messaging_postbacks` event when you setup your webhook.
- *Message Delivered callback* – This callback will occur when a message a page has sent has been delivered. You must have subscribed to the `message_deliveries` event when you setup your webhook.
- *Authentication callback* – This callback will occur when the Send-to-Messenger plugin has been tapped. You must have subscribed to the `messaging_optins` event when you setup your webhook.
- *Message Read callback* – This callback will occur when a message a page has sent has been read by the user. You must have subscribed to the `message_reads` event when you setup your webhook.
- *Message Echo callback* – This callback will occur when a message has been sent by your page. You may receive text messages or messages with attachments (image, video, audio, template or fallback). You must have subscribed to the `message_echoes` event when you setup your webhook.
- *Checkout Update callback (BETA)* – This callback will occur when using the Buy Button with a flexible-amount transaction. This allows you to update pricing based on a person's shipping address. You must have subscribed to the `messaging_checkout_updates` event when you setup your webhook. **At the moment, this is not available outside the US.**
- *Payment callback (BETA)* – This callback will occur when a person taps the pay button from the checkout dialog rendered by the Buy Button. You must have subscribed to the `messaging_payments` event when you setup your webhook. **At the moment, this is not available outside the US.**

If the event is a Postback, we call the `processPostback()` function where we check the `payload` value. Remember, we had set `Greeting` as the payload of the Get Started button, so here we first check if the messaging event was sent as a result of clicking that button. If so, we use the User Profile API to get the user's first name and use this to personalize the message that will be sent back to them. From the API, you can get their first name, last name, profile picture, locale, timezone, and gender.

The message is then sent to the `sendMessage()` function which POST's it to the Messenger Platform. Back in the Webhook POST handler, we return a 200 OK HTTP response.

It is important to return a 200 response as fast as possible. Facebook will wait for a 200 before sending you the next message. In high volume bots, a delay in returning a 200 can cause significant delays in Facebook delivering messages to your webhook.

If your webhook returns an error (i.e. not a 2XX status) or times out (i.e. takes longer than 20 second to respond) and keeps doing so for over 15 minutes, you'll be sent a warning alert.

If the webhook continues to fail for 8 hours, then Facebook will send you an alert letting you know that the webhook is being disabled, then your app will be unsubscribed. Once you've fixed the issues, you must re-add your webhook and re-subscribe the app to the page.

Commit the changes and push them to Heroku.

To test the bot, you can start a conversation with your page either from facebook.com, the facebook mobile app or using your Messenger short URL https://m.me/PAGE_USERNAME (we'll see how to create a username shortly).

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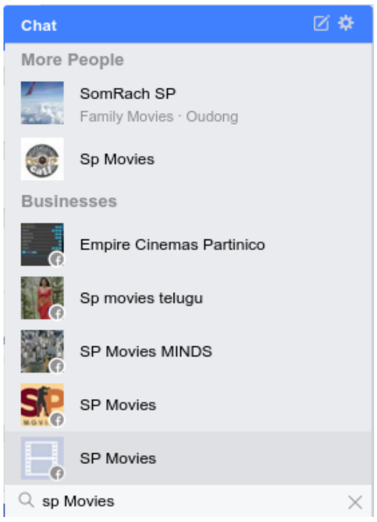
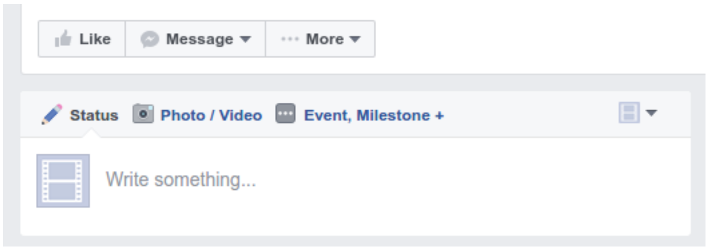
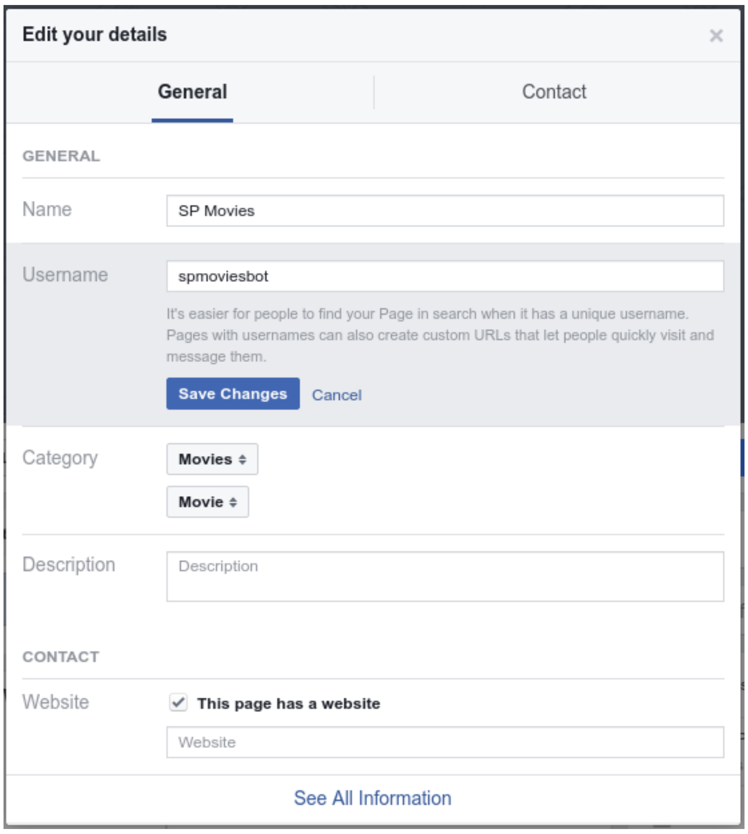
On Facebook and Messenger, you can find the Page by searching for the page name.



As you can see from the above, you can't always guarantee that the page's name will be unique. Your users might select the wrong page. To prevent this you can set a unique username for the page. To do this, go to your Page's home page and select *Edit Page Info* from the *More* dropdown menu.



Then set the Username.



Edit your details

General | Contact

GENERAL

Name: SP Movies

Username: spmoviesbot

It's easier for people to find your Page in search when it has a unique username. Pages with usernames can also create custom URLs that let people quickly visit and message them.

Save Changes | Cancel

Category: Movies / Movie

Description: Description

CONTACT

Website: ✓ This page has a website

Website

See All Information

Now if you search for `@page_username` you'll get the right page. You can also go to `https://m.me/PAGE_USERNAME` to start the interaction.

Below, you can see the greeting text we set for the Welcome Screen as well as the *Get Started* button.

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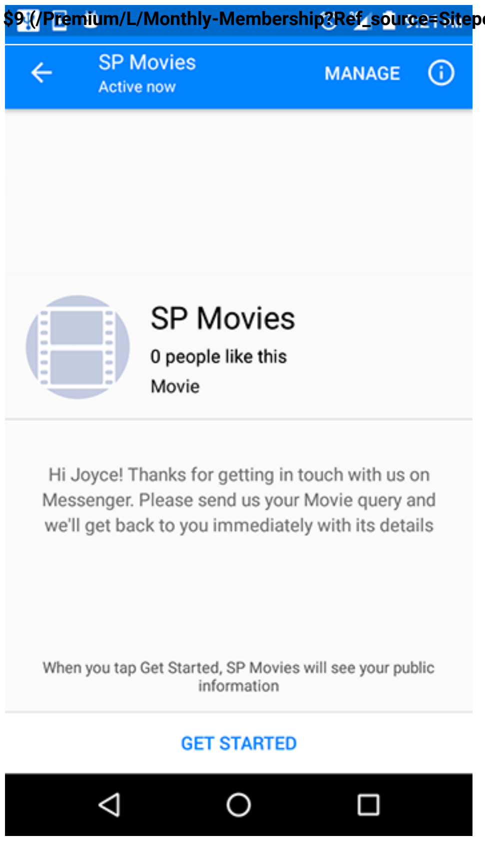

SP Movies
Active now
MANAGE

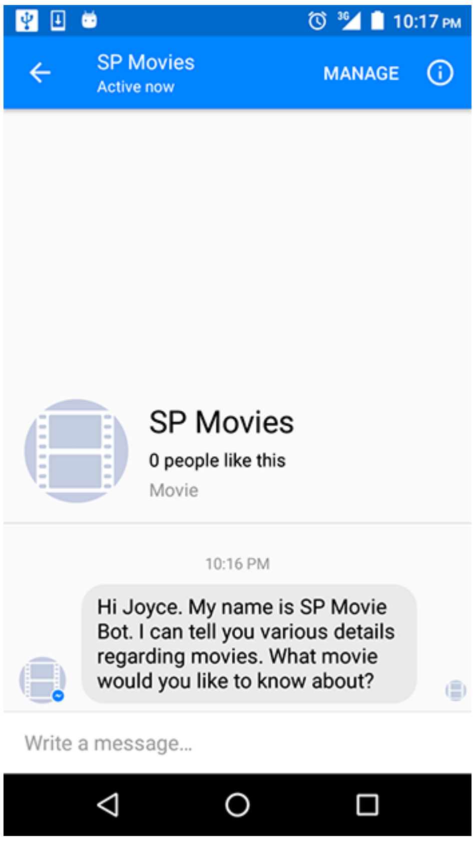
SP Movies
0 people like this
Movie

Hi Joyce! Thanks for getting in touch with us on Messenger. Please send us your Movie query and we'll get back to you immediately with its details

When you tap Get Started, SP Movies will see your public information

GET STARTED

On tapping the button, you should see the message sent from the server.


10:17 PM
SP Movies
Active now
MANAGE

SP Movies
0 people like this
Movie

10:16 PM

Hi Joyce. My name is SP Movie Bot. I can tell you various details regarding movies. What movie would you like to know about?

Write a message...

If you enter any text, you won't get back any response. We'll take care of this next.

Setting up the Database

When the user enters a movie name, the bot will use the Open Movie Database API (http://www.omdbapi.com/) to get the details of the movie. The API request we'll use will only fetch the first matched result, therefore the movie returned might not always be what the user wanted. Because of this, the bot will first confirm with the user to see if it got the movie right and after that, the user can get details like the movie's plot, cast, IMDB rating, etc. They can also enter another movie name and get its details instead.

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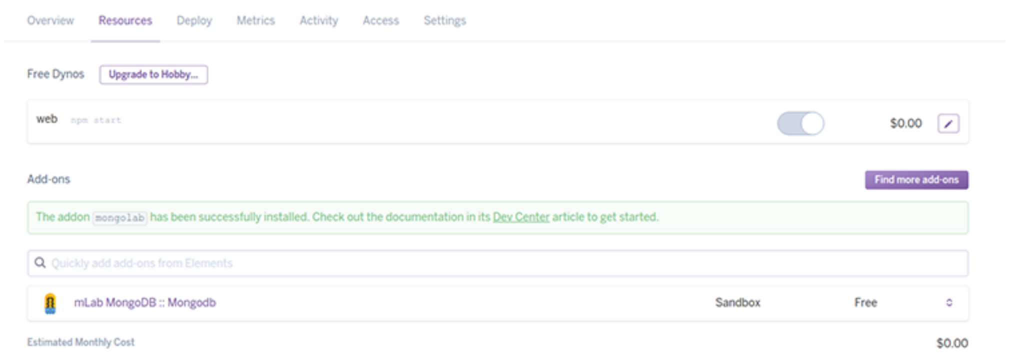
Because of this back and forth, the bot will need to remember the user's current movie entry. Facebook doesn't keep a session open with your webhook, so any data you store in a session object will be lost on the next request. We'll instead save this data in a database – MongoDB to be specific. We'll use mLab's (https://mlab.com/) add-on on Heroku.

mLab is a Database-as-a-Service for MongoDB. On Heroku, while you can use the free sandbox mlab plan, you will need to have a credit card saved on Heroku for verification. If you do not want to provide your card details, then you can register an account on the mLab website, create a free-tier sandbox database there and link to that from your code (more on this shortly).

To use the addon on Heroku, go to the app's dashboard and select the *Resources* tab. Search for `mlab` and select the result. On the dialog window that pops up, select the `Sandbox - Free` plan from the dropdown menu and click on *Provision*. You should see a confirmation of the chosen add-on.



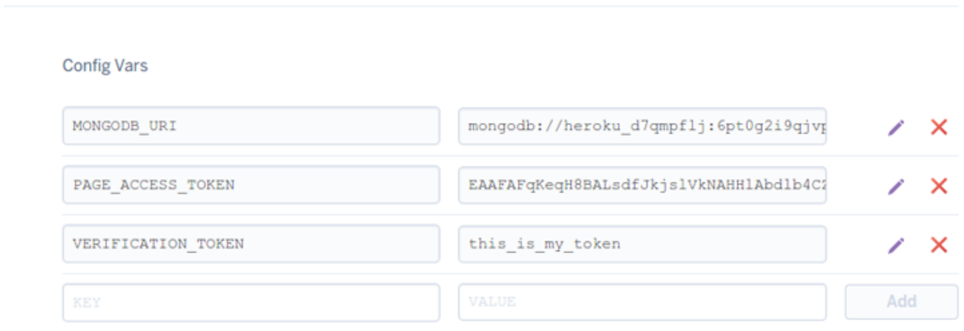
web npm start $0.00

The addon mongolab has been successfully installed. Check out the documentation in its Dev Center article to get started.

mLab MongoDB :: Mongodb Sandbox Free

Estimated Monthly Cost $0.00

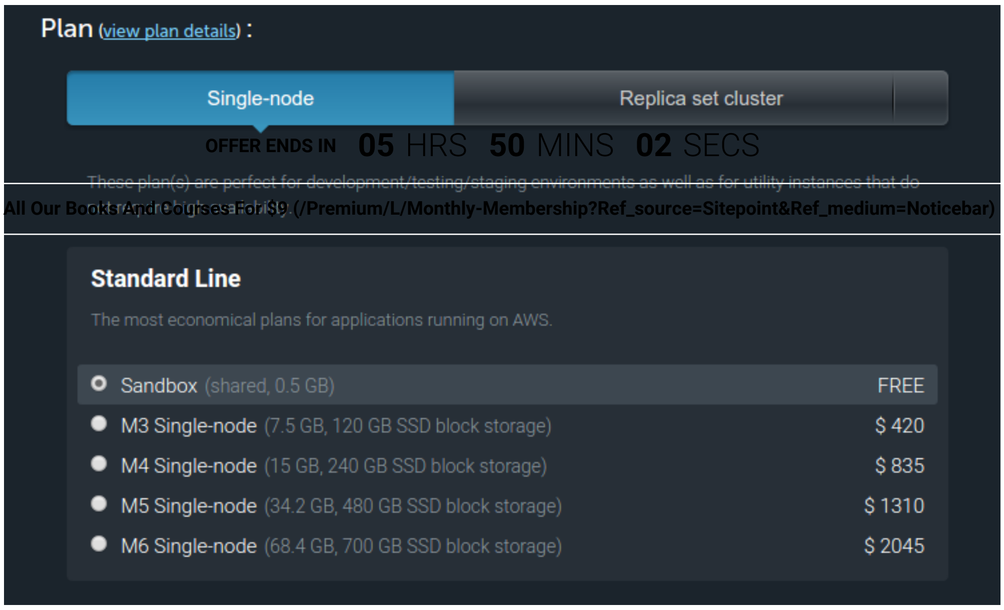
If you check your environment variables on Heroku, you will see one with your MongoDB's URI already set up.



```
MONGODB_URI          mongodb://heroku_d7qmpflj:6pt0g2i9qjvp
PAGE_ACCESS_TOKEN    EAAFAFqKeqH8BALsdfJkjslVkNAHHlAbdlb4C2
VERIFICATION_TOKEN   this_is_my_token
```

Setting up a database via the mLab website

If you prefer setting up the MongoDB database on the mLab website, then register for an account there and head over to the Create new deployment (https://mlab.com/create) page. Change the *Plan* setting to *Single-node* and then select *Sandbox* from the *Standard Line* section.


Plan (view plan details) :
Single-node
Replica set cluster
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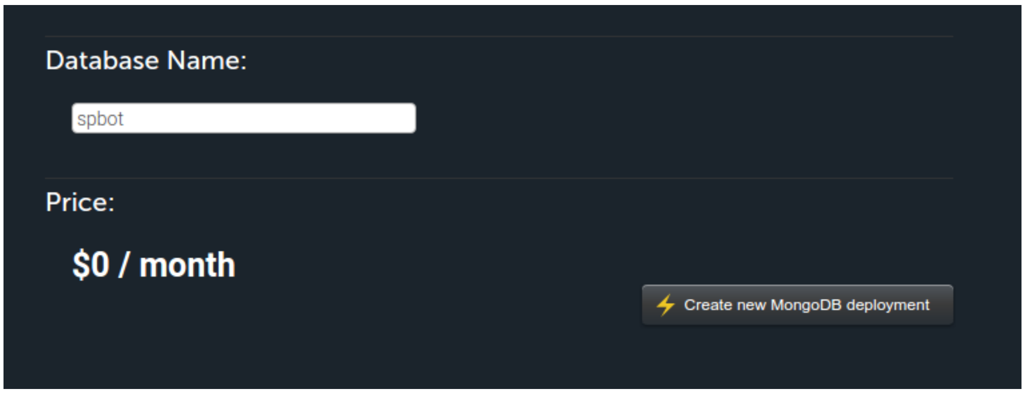
Standard Line

The most economical plans for applications running on AWS.

● Sandbox (shared, 0.5 GB)	FREE
M3 Single-node (7.5 GB, 120 GB SSD block storage)	$ 420
M4 Single-node (15 GB, 240 GB SSD block storage)	$ 835
M5 Single-node (34.2 GB, 480 GB SSD block storage)	$ 1310
M6 Single-node (68.4 GB, 700 GB SSD block storage)	$ 2045

Set a name for your database and complete the process by clicking the *Create new MongoDB deployment* button.



Database Name: spbot

Price: $0 / month

On the page that follows, select the database you just created from the displayed table. A page will be opened that will show instructions on how to access the database.

Select the *Users* tab, and click the button *Add database user*. Fill out a username and password, and click *Create*. This creates a new set of credentials you can use to allow your app access to the DB.

In the top-half of the page, find and copy the database URI — it will look like `mongodb://<dbuser>:<dbpassword>@dsxxxxxx.mlab.com:55087/spbot`. Insert the `dbuser` name and password that you just created. On Heroku, create an environment variable named `MONGODB_URI` and paste in the database's URI as its value.

Defining the Model Class

Back in the Node app, create a file labeled `movie.js` and save it in a folder labeled `models`. Paste the following into the file:

(/)

```
var mongoose = require("mongoose");
var Schema = mongoose.Schema;

var MovieSchema = new Schema({
  user_id: {type: String},
  title: {type: String},
  plot: {type: String},
  date: {type: String},
  runtime: {type: String},
  director: {type: String},
  cast: {type: String},
  rating: {type: String},
  poster_url: {type: String}
});

module.exports = mongoose.model("Movie", MovieSchema);
```

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The above creates the movies database model. The `user_id` will be the user's ID obtained from the Messenger Platform while the other fields will be fetched from the movies API. We'll only store the user's last searched movie, so the database will only have one record per user.

We could have omitted the `user_id` field and just used the user's ID as the `_id` of each record created. This would have worked since the user IDs are unique for the Facebook Page. If you are going to do this, you should be aware that user IDs are page-scoped. This means that the IDs of users are unique for a given page, but a user can have a different id for different pages.

You need only to be aware of this if your bot is serving different Pages (yes, a bot can serve multiple pages (http://stackoverflow.com/a/36665745/1380071)). Thus, if your bot is serving several pages it might be faulty to identify the users by their user IDs only and it will also be faulty to use the user ID for the record's `_id` field since this has to be unique and you won't be able to guarantee this uniqueness across Pages.

Putting It All Together

With the database and model set up, we can now finish up the chatbot. The code will be presented in parts, but if you want to paste the whole code into your project, here is the link (https://github.com/sitepoint-editors/spbot/blob/master/app.js) to the `app.js` file.

Start off by setting the database connection. Mongoose should have already been installed previously with other modules.

```
var mongoose = require("mongoose");

var db = mongoose.connect(process.env.MONGODB_URI);
var Movie = require("./models/movie");
```

Modify the webhook's POST handler as shown.

(/)
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```
// All callbacks for Messenger will be POST-ed here
app.post("/webhook", function (req, res) {
  // Make sure this is a page subscription
  if (req.body.object == "page") {
    // Iterate over each entry
    // There may be multiple entries if batched
    req.body.entry.forEach(function(entry) {
      // Iterate over each messaging event
      entry.messaging.forEach(function(event) {
        if (event.postback) {
          processPostback(event);
        } else if (event.message) {
          processMessage(event);
        }
      });
    });

    res.sendStatus(200);
  }
});
```

We've added a check for events that are of type `message`, passing them to the `processMessage()` function.

```
function processMessage(event) {
  if (!event.message.is_echo) {
    var message = event.message;
    var senderId = event.sender.id;

    console.log("Received message from senderId: " + senderId);
    console.log("Message is: " + JSON.stringify(message));

    // You may get a text or attachment but not both
    if (message.text) {
      var formattedMsg = message.text.toLowerCase().trim();

      // If we receive a text message, check to see if it matches any special
      // keywords and send back the corresponding movie detail.
      // Otherwise, search for new movie.
      switch (formattedMsg) {
        case "plot":
        case "date":
        case "runtime":
        case "director":
        case "cast":
        case "rating":
          getMovieDetail(senderId, formattedMsg);
          break;

        default:
          findMovie(senderId, formattedMsg);
      }
    } else if (message.attachments) {
      sendMessage(senderId, {text: "Sorry, I don't understand your request."});
    }
  }
}
```

Here, we first check if the message was sent via the Message Echo Callback. This callback will occur when a message has been sent by your page. For instance, the first message we sent to the user (the greeting) will be sent back to our Webhook. We don't want to process any of our own messages so we put a check for this.

We then check if the message is a text or attachment (image, video, audio). In the case of the latter, we send an error message to the user. For text messages, we check if the input matches certain keywords that will indicate what detail of the movie the user wants. At this point, the user will have already made a query of a movie and the movie will be saved in the database. The `getMovieDetail()` function queries the database and returns the particular record.

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```
function getMovieDetail(userId, field) {
  Movie.findOne({user_id: userId}, function(err, movie) {
    if(err) {
      sendMessage(userId, {text: "Something went wrong. Try again"});
    } else {
      sendMessage(userId, {text: movie[field]});
    }
  });
}
```

If the user's query didn't match any of the set keywords, the bot assumes the input is for a movie query, so this is passed to the `findMovie()` function which calls the Open Movie Database API with the input.

(/)
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```
function findMovie(userId, movieTitle) {
  request("http://www.omdbapi.com/?type=movie&amp;t=" + movieTitle, function (error, response, body) {
    if (!error &amp;&amp; response.statusCode === 200) {
      var movieObj = JSON.parse(body);
      if (movieObj.Response === "True") {
        var query = {user_id: userId};
        var update = {
          user_id: userId,
          title: movieObj.Title,
          plot: movieObj.Plot,
          date: movieObj.Released,
          runtime: movieObj.Runtime,
          director: movieObj.Director,
          cast: movieObj.Actors,
          rating: movieObj.imdbRating,
          poster_url:movieObj.Poster
        };
        var options = {upsert: true};
        Movie.findOneAndUpdate(query, update, options, function(err, mov) {
          if (err) {
            console.log("Database error: " + err);
          } else {
            message = {
              attachment: {
                type: "template",
                payload: {
                  template_type: "generic",
                  elements: [{
                    title: movieObj.Title,
                    subtitle: "Is this the movie you are looking for?",
                    image_url: movieObj.Poster === "N/A" ? "http://placehold.it/350x150" : movieObj.Poster,
                    buttons: [{
                      type: "postback",
                      title: "Yes",
                      payload: "Correct"
                    }, {
                      type: "postback",
                      title: "No",
                      payload: "Incorrect"
                    }]
                  }]
                }
              }
            };
            sendMessage(userId, message);
          }
        });
      } else {
          console.log(movieObj.Error);
          sendMessage(userId, {text: movieObj.Error});
      }
    } else {
      sendMessage(userId, {text: "Something went wrong. Try again."});
    }
  });
}
```

If a movie is found, its details are saved together with the user's ID. If a record with that user ID has previously been created, then it will instead be updated. We then create a Structured Message and send it to the user.

Apart from text, the Messenger Platform allows you to send back images, video, audio, files and Structured Messages. Structured Messages are templates that support different kinds of use cases. The Button Template (https://developers.facebook.com/docs/messenger-platform/send-api-reference/button-template) allows you to send text and buttons. The Generic Template (https://developers.facebook.com/docs/messenger-platform/send-api-reference/generic-template) allows you to define an image, title, subtitle, and buttons. In our app, we use the generic template.

Modify the `processPostback()` function as shown.

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```
function processPostback(event) {
  var senderId = event.sender.id;
  var payload = event.postback.payload;

  if (payload === "Greeting") {
    // Get user's first name from the User Profile API
    // and include it in the greeting
    request({
      url: "https://graph.facebook.com/v2.6/" + senderId,
      qs: {
        access_token: process.env.PAGE_ACCESS_TOKEN,
        fields: "first_name"
      },
      method: "GET"
    }, function(error, response, body) {
      var greeting = "";
      if (error) {
        console.log("Error getting user's name: " +  error);
      } else {
        var bodyObj = JSON.parse(body);
        name = bodyObj.first_name;
        greeting = "Hi " + name + ". ";
      }
      var message = greeting + "My name is SP Movie Bot. I can tell you various details regarding movies. What 
movie would you like to know about?";
      sendMessage(senderId, {text: message});
    });
  } else if (payload === "Correct") {
    sendMessage(senderId, {text: "Awesome! What would you like to find out? Enter 'plot', 'date', 'runtime', 
'director', 'cast' or 'rating' for the various details."});
  } else if (payload === "Incorrect") {
    sendMessage(senderId, {text: "Oops! Sorry about that. Try using the exact title of the movie"});
  }
}
```

Here we add two checks for the `Correct` and `Incorrect` payload messages. These will be attached to buttons that the user will use to let the bot know if it presented the correct movie.

Commit your code and push it to Heroku, then try sending messages to the bot.

When you send a query to the bot, if it finds the movie, it sends back a structured message that checks if the correct movie was fetched.

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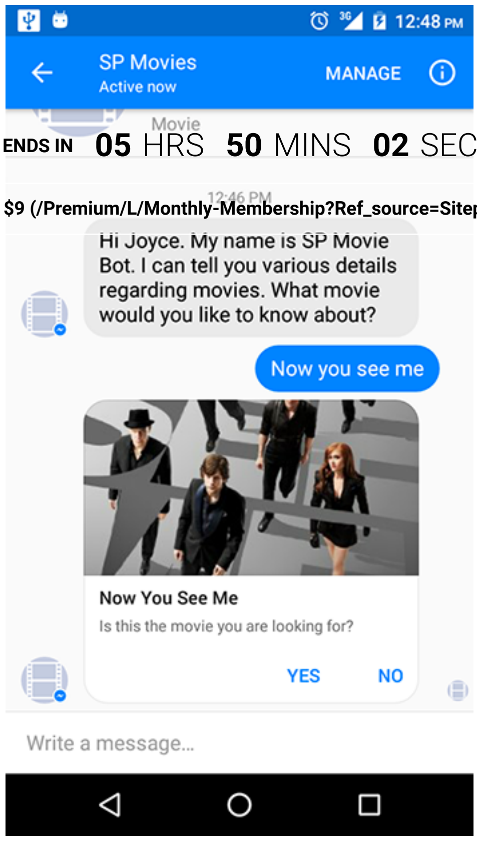
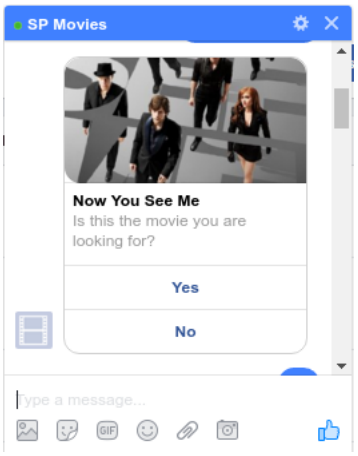

SP Movies
Active now
MANAGE
Movie
12:46 PM
Hi Joyce. My name is SP Movie Bot. I can tell you various details regarding movies. What movie would you like to know about?
Now you see me
Now You See Me
Is this the movie you are looking for?
YES
NO
Write a message...

On the web (and iOS), this looks a bit different.



Structured messages can have different types of buttons as shown:

URL button: Open a URL in the in-app browser
Postback button: Send a postback to your webhook when you want to send an action to your bot
Call button: Call a phone number
Share button: Open a share dialog so that messages can be shared with friends
Buy button: Open a checkout dialog for purchases

In our example, we use two Postback buttons and set their payload values to `Correct` and `Incorrect`. If you look at the `processPostback()` function, you'll see the checks for these two payloads. If the *No* button is tapped, the following message will be returned:

(/)

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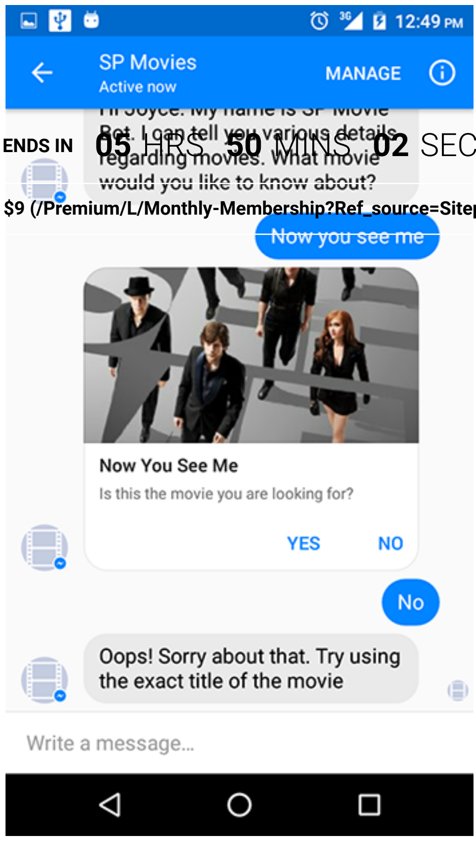


Hi Joyce. My name is SP Movie Bot. I can tell you various details regarding movies. What movie would you like to know about?

Now you see me

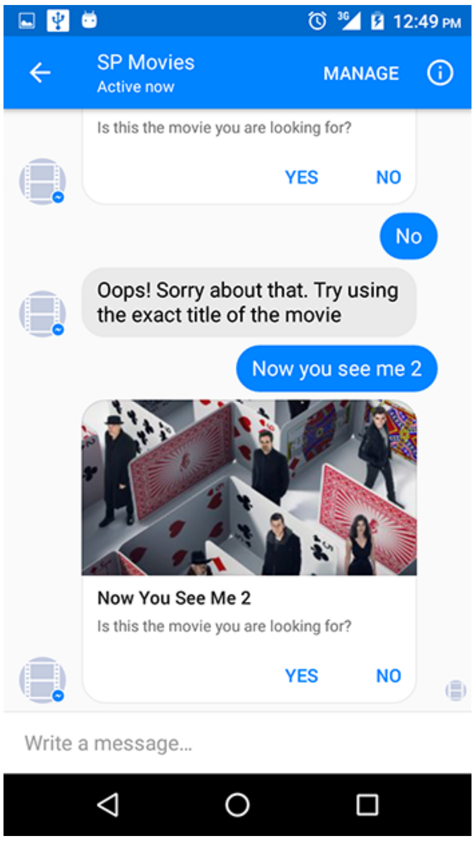
Now You See Me

Is this the movie you are looking for?

No

Oops! Sorry about that. Try using the exact title of the movie

The user can then make another query.



Is this the movie you are looking for?

No

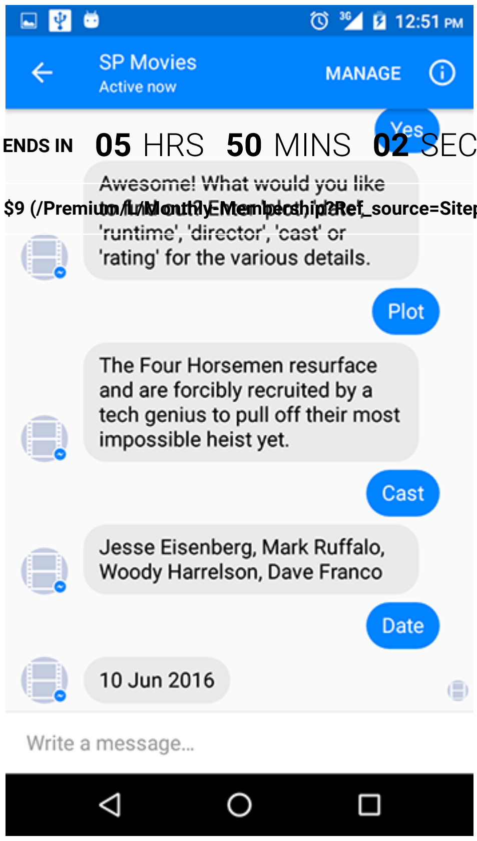
Oops! Sorry about that. Try using the exact title of the movie

Now you see me 2

Now You See Me 2

Is this the movie you are looking for?

And on confirming that it is the correct movie, they will get further instructions from the bot on how to proceed.



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SP Movies
Active now

Yes

Awesome! What would you like [illegible] 'runtime', 'director', 'cast' or 'rating' for the various details.

Plot

The Four Horsemen resurface and are forcibly recruited by a tech genius to pull off their most impossible heist yet.

Cast

Jesse Eisenberg, Mark Ruffalo, Woody Harrelson, Dave Franco

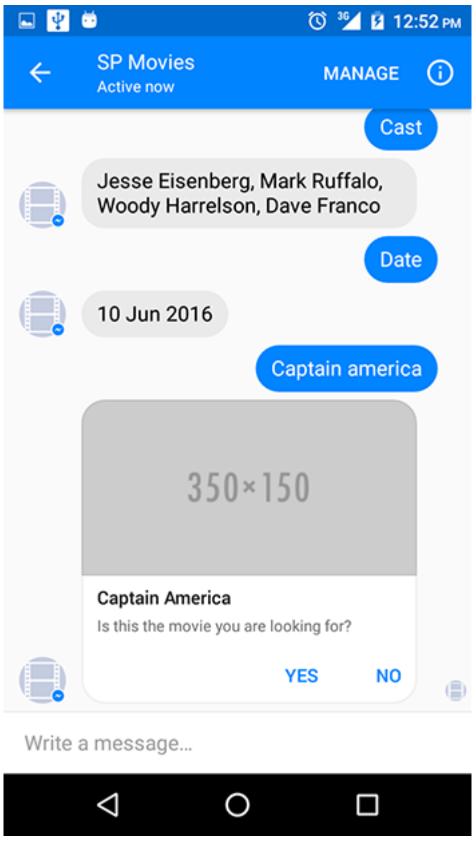
Date

10 Jun 2016

Remember, we check for these keywords in `processMessage()`.

You have to make sure that the structured message you send is well-formed, otherwise it won't be shown to the user. In the demo app, I noticed that there are some movies returned by the movies API that are missing some details in some of their fields. In such cases, the value of the field is `N/A`. In our structured message, we are using two fields from the object returned by the API – the Title and the Poster (URL for the movie poster). If a movie is found, it will always have a Title, so there is no need to confirm this, but if the movie doesn't have a Poster and you don't provide an alternate URL for this, the structured message will fail to be shown. So make sure the attributes in your structured messages always have values.

In our case, we link to a placeholder image in case none was returned.



SP Movies
Active now

Cast

Jesse Eisenberg, Mark Ruffalo, Woody Harrelson, Dave Franco

Date

10 Jun 2016

Captain america

350×150

Captain America
Is this the movie you are looking for?

YES NO

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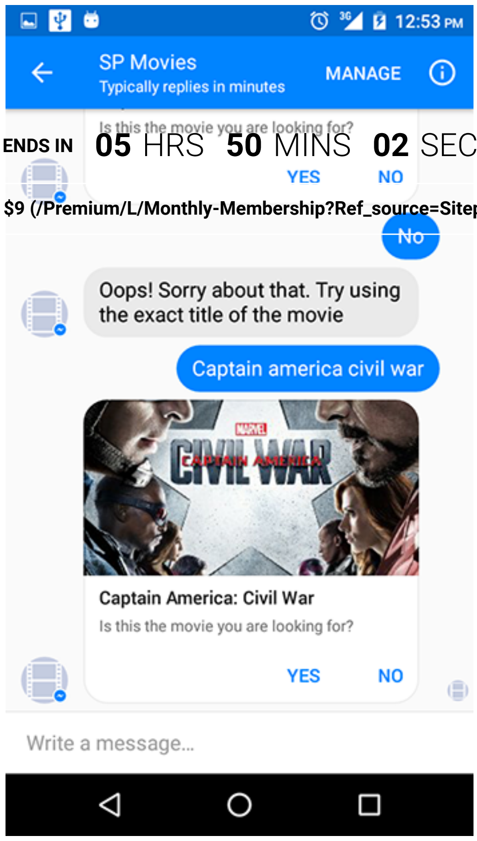

SP Movies
Typically replies in minutes
MANAGE

Is this the movie you are looking for?
YES NO

No

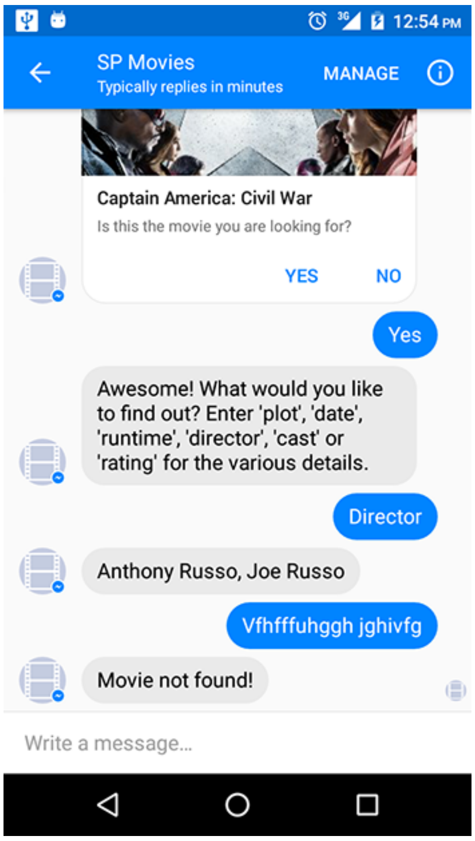
Oops! Sorry about that. Try using the exact title of the movie

Captain america civil war

Captain America: Civil War
Is this the movie you are looking for?
YES NO

Write a message...

If no movie is found matching the user's query, the bot lets them know that.


SP Movies
Typically replies in minutes
MANAGE

Captain America: Civil War
Is this the movie you are looking for?
YES NO

Yes

Awesome! What would you like to find out? Enter 'plot', 'date', 'runtime', 'director', 'cast' or 'rating' for the various details.

Director

Anthony Russo, Joe Russo

Vfhfffuhggh jghivfg

Movie not found!

Write a message...

Going Live with Your Facebook Chat Bot

When you're ready to release your app to the public, it must go through an approval process. Before the app is approved, only you and testers you invite will be able to interact with it. The submission process to the review team is out of the scope of this tutorial, but this guide (https://developers.facebook.com/docs/messenger-platform/app-review) will tell you what you need to do.

Conclusion

In this tutorial, we've built a simple Facebook chat bot that is capable of getting requests from a user on Messenger and responding to them. The bot is far from perfect, however. When a user is interacting with it, they are limited to a strict set of commands. This isn't how people talk to each other. The bot can be improved in a way that will enable users to interact with it in a more natural way as they would in a human interaction, as opposed to just using commands. This can be done by integrating Natural Language Processing into the bot. To do this, you can build your own NLP engine or use a service such as wit.ai (https://wit.ai/) which enables you to add NLP into your apps. wit.ai is owned by Facebook and is free to use for both personal and commercial projects.

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What do you think of chat bots and their increasing use? If you own a Facebook Page, would you consider letting a bot handle interactions with your users? Let me know what you think in the comments.

Want to learn more about bots? Check out our new Premium course on creating a Skype bot with the Microsoft Bot Framework (https://www.sitepoint.com/premium/courses/ms-bots-2939/)!

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Meet the author

Joyce Echessa (https://www.sitepoint.com/author/jechessa/) (https://twitter.com/joyceechessa) (https://plus.google.com/u/0/+JoyceEchessa) (https://github.com/echessa)

I am a web developer who dabbles in mobile development from time to time. You can find me on Twitter @joyceechessa (https://twitter.com/joyceechessa) to see what I'm up to.

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